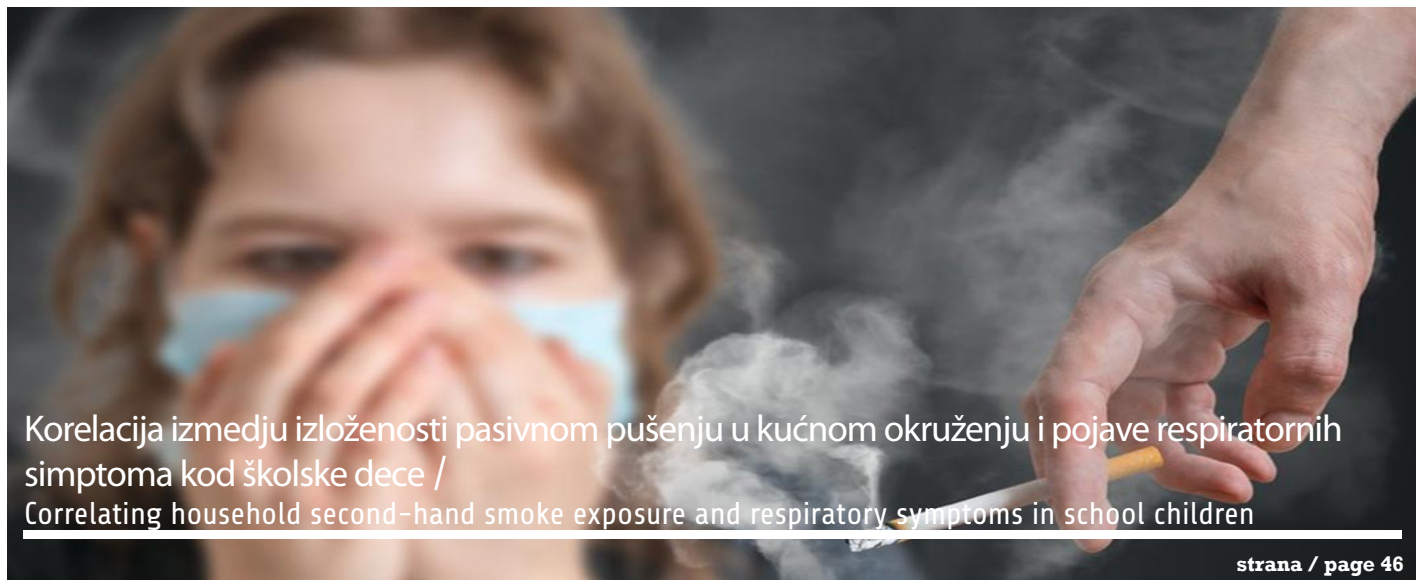




ORIGINALNI RAD / ORIGINAL ARTICLE



Korelacija izmedju izloženosti pasivnom pušenju u kućnom okruženju i pojave respiratornih simptoma kod školske dece /
 Correlating household second-hand smoke exposure and respiratory symptoms in school children

strana / page 46

CASE REPORT / ПРИКАЗ СЛУЧАЈА



Рехабилитација деце са артрогрипозом /
 Rehabilitation of children with arthrogryposis

strana / page 69

ORIGINALNI RAD / ORIGINAL ARTICLE



Učestvovanje dece sa cerebralnom paralizom
 u svakodnevnom životu / Engagement of children
 with cerebral palsy in daily life

strana / page 41

SHORT COMMUNICATION / КРАТКО САОПШТЕЊЕ

Предности деротације
 Ц1 и Ц2 код пацијента
 са хроничним
 миофасцијалним
 боловима у врату

The benefits of the C1 and
 C2 vertebrae derotation
 in a patient with chronic
 cervical myofascial pain

strana / page 65

НАЈАВА ДОГАЂАЈА / MEETING ANNOUNCEMENT

3. Симпозијум
 ринолога Србије
 са међународним
 учешћем, Београд, 16.
 Март 2018

The 3rd Symposium of
 rhinologists of Serbia
 with international par-
 ticipation, Belgrade, Ser-
 bia, 16th March 2018

strana / page 83



ZAVOD ZA JAVNO ZDRAVLJE ČUPRIJA
 "POMORAVLJE", u ČUPRIJI
 www.zjzcuprija.com



PODRUŽNICA SRPSKOG
 LEKARSKOG DRUŠTVA
 ČUPRIJA



DRUŠTVO ZA NEURONAUKU
 "SOZERCANJE IZ ŠUMADIJE"
 KRAGUJEVAC

OSNIVAČ I VLASNIK / FOUNDER & OWNER

Zavod za javno zdravlje Čuprija "Pomoravlje" u Čupriji
Institute for Public Health Cuprija "Pomoravlje"
in Cuprija, Serbia

IZDAVAČI / PUBLISHERS

Zavod za javno zdravlje Čuprija "Pomoravlje" u Čupriji
Podružnica Srpskog lekarskog društva, Čuprija
Društvo za neuronauke "Sozercanje iz Šumadije",
Kragujevac
Institute for Public Health Cuprija "Pomoravlje"
in Cuprija, Serbia
Regional Section of Serbian Medical Society,
Cuprija, Serbia
Society for Neuroscience "Sozercanje iz Sumadije",
Kragujevac, Serbia

GLAVNI UREDNIK / EDITOR IN CHIEF

Prof dr Dragutin Arsić, Čuprija (SRB)

IZVRŠNI UREDNIK / EXECUTIVE EDITOR

Prim Dr Dragana Radovanović, Čuprija (SRB)

POMOĆNICI UREDNIKA / DEPUTY EDITORS

Prof dr Isidor Jevtović, Beograd (SRB)
Prof dr Dragan Milovanović, Kragujevac (SRB)

UREĐIVAČKI ODBOR / EDITORIAL BOARD

Prof dr Rade Babić, Beograd (SRB)
Prof dr Predrag Sazdanović, Kragujevac (SRB)
Prof dr Budimka Novaković, Novi Sad (SRB)
Prof dr Branislav Petrović, Niš (SRB)
Prof dr Dragan Ravanić, Kragujevac (SRB)
Prof dr Dejan Petrović, Kragujevac (SRB)
Prof dr Sunčica Petrovska, Skoplje (BRM)
Prof dr Radmila Veličković Radovanović, Niš (SRB)
Ass Prof dr Henry Dušan, Atkinson, London (UK)
Prof dr Dušan Đurić, Beograd (SRB)
Prof dr Srđan Milovanović, Beograd (SRB)
Prof dr Miroslav Stojadinović, Kragujevac (SRB)
Mr sc. med. dr Miroslav Mitrović, Beograd (SRB)
Dr sci med Mile Despotović, Čuprija (SRB)

IZDAVAČKI SAVET / PUBLISHING COUNCIL

Prof dr Mihailo Pantović, Kragujevac (SRB)
Dr Goran Radovanović, Čuprija (SRB)
Dr Miroslav Stojanović, Čuprija (SRB)
Dr Slobodan Gajić, Čuprija (SRB)

REDAKCIJA / EDITORIAL OFFICE STAFF

Dr Ivica Jocić
Mr sc. med. dr Vladan Vlajković
dipl.eng.el. Zoran Živković
Sanja Mihajlović
Dr Andreja Todorović

LEKTOR I KOREKTOR / SERBIAN LANGUAGE EDITING

Prof. Zorica Marinković

PREVODILAC / ENGLISH LANGUAGE EDITING

Prof. Nevena Šimšić

DIZAJN / DESIGN

Radisav Stanković, Zedesino, Beograd (SRB)

TEHNIČKA OBRADA / TECHNICAL PROCESSING

Zoran Živković, Niš (SRB)

ŠTAMPARIJA / PRESS

Štampa se ćirilicom i latinicom
Dizajn studio RP, Čuprija (SRB)

GODIŠNJA PRETPLATA / YEARLY SUBSCRIPTION

Izlazi polugodišnje / Issued semiannually
Za pravna lica 4000,00 dinara
Za fizička lica 2000,00 dinara
Foreign Countries 50,00 Euros

ADRESA UREĐIVAČKOG ODBORA / EDITORIAL OFFICE

Zavod za javno zdravlje Čuprija "Pomoravlje" Čuprija
PONS Medicinski časopis
35230 Čuprija, Miodraga Novakovića 78, SRBIJA
Institute for Public Health Cuprija "Pomoravlje"
PONS Medical Journal
35230 Cuprija, Miodraga Novakovica 78, Serbia
T.R. 840 - 131667 - 14 Uprava za trezor Čuprija

TELEFON / PHONE

+381 (0)35/847-00-36, +381 (0)35/847-32-89

FAX

+381 (0)35/847-05-59

E-MAIL

redakcija@ponsjournal.info

SAJT / HOME PAGE

www.ponsjournal.info

ORIGINALNI RAD / ORIGINAL ARTICLE

- Učestvovanje dece sa cerebralnom paralizom u svakodnevnom životu /
Engagement of children with cerebral palsy in daily life
Sanela Slavković, Špela Golubović, Sanja Kalaba, Ivana Broćilo.....41
- Correlating household second-hand smoke exposure and respiratory symptoms in school children /
Korelacija između izloženosti pasivnom pušenju u kućnom okruženju i pojave respiratornih simptoma kod školske dece?
Branislava Matić, Dragana Vujanović, Snežana Dejanović, Verica Jovanović, Nela Djonović.....46

ПРЕГЛЕДНИ ЧЛАНАК / REVIEW ARTICLE

- Effect of stress and professional burning on moral and ethical values in physiotherapy profession /
Uticaj stresa i profesionalnog sagorevanja na moralne i etičke vrednosti u profesiji fizioterapeuta
Stevan Jovanović, Biljana Stojanović.....52
- Hiperprolaktinemija / Hyperprolactinemia
Aleksandar Aleksić, Vojkan Stanojević, Saška Manić, Mile Despotović, Nataša Savić, Čedomirka Stanojević,
Milena Despotović.....59

SHORT COMMUNICATION / КРАТКО САОПШТЕЊЕ

- The benefits of the C1 and C2 vertebrae derotation in a patient with chronic cervical myofascial pain /
Предности деротације Ц1 и Ц2 код пацијента са хроничним миофасцијалним боловима у врату
Pop Marius Sorin, Debucean Daiana, Lalu Manuela.....65

CASE REPORT / ПРИКАЗ СЛУЧАЈА

- Rehabilitation of children with arthrogryposis / Рехабилитација деце са артрогрипозом
Оливер Милошевић, Емилија Милетић, Дејан Јеремић.....69
- Acute cardiac failure during influenza A (H1N1) treated with noninvasive ventilation /
Primena neinvazivne ventilacije kod akutne srčane insuficijencije uzrokovane influencom A (H1N1)
Romana Suša, Vojislav Čupurdija, Ljiljana Novković, Zorica Lazić, Marina Petrović, Bojan Đokić,
Anita Ivošević, Marko Vuleta, Ivan Čekerevac.....78

IZVEŠTAJ SA KONGRESA / CONFERENCE REPORT

8. svetski kongres medicinske mikologije, 6 - 9. oktobra 2017. godine-Beograd /
8th Trends in Medical Mycology, 6 - 9. October 2017. Belgrade, Serbia
Nikola Rosić.....82

HAJABA DOGAĐAJA / MEETING ANNOUNCEMENT

3. Симпозијум ринолога Србије са међународним учешћем, Београд, 16. Март 2018 /
The 3rd Symposium of rhinologists of Serbia with international participation, Belgrade, Serbia, 16th March 2018
Александар Перић.....83

ПРИКАЗ КЊИГЕ / BOOK REVIEW

- Gotovi lekovi: Priručnik za farmakoterapiju .XV izdanje. /
Approved drugs: The manual for pharmacotherapy. 15th ed.
Rajko Igić.....84

UPUTSTVO AUTORIMA / INSTRUCTIONS FOR AUTHORS

- Uputstvo autorima za pripremu rukopisa /
Instructions for authors for the preparation of manuscripts.....85
-

Učestvovanje dece sa cerebralnom paralizom u svakodnevnom životu

Engagement of children with cerebral palsy in daily life

Sanela Slavković¹, Špela Golubović¹, Sanja Kalaba¹, Ivana Bročilo²

1. Univerzitet u Novom Sadu, Medicinski fakultet, Katedra za specijalnu rehabilitaciju i edukaciju, Novi Sad, Republika Srbija
2. Osnovna škola "Jovan Jovanović Zmaj", Šid, Republika Srbija

PRIMLJEN 23.06.2017.
PRIHVACEN 07.11.2017.

Sanela Slavkovic¹, Spela Golubovic¹, Sanja Kalaba¹, Ivana Brocilo²

1. University of Novi Sad, Faculty of Medicine, Department of Special Education and Rehabilitation, Novi Sad, Serbia
2. Primary school "Jovan Jovanović Zmaj", Šid, Serbia

RECEIVED 23.06.2017.
ACCEPTED 07.11.2017.

APSTRAKT

Cilj. Aktivno učestvovanje dece sa cerebralnom paralizom u svakodnevnom životu je prediktor ukupne socijalne participacije i od ključnog značaja za njihov kvalitet života. Cilj ovog istraživanja jeste utvrditi stepen učestvovanja dece sa cerebralnom paralizom u porodičnim aktivnostima, rekreativnim aktivnostima i brizi o sebi, kao i nivo zadovoljstva u tim aktivnostima.

Metod. Istraživanjem je obuhvaćeno 50 dece uzrasta 7 do 11 godina. Eksperimentalnu grupu je činilo 25 učenika sa cerebralnom paralizom dok je kontrolna grupa obuhvatala 25 učenika tipične populacije. U istraživanju je korišćen upitnik "Angažovanje deteta u svakodnevnom životu" (Child Engagement in Daily Life). Instrument je namenjen roditeljima za opisivanje i evaluaciju dečijeg učešća u porodičnim i rekreativnim aktivnostima, kao i brizi o sebi. Sastoji se iz 18 ajtema. Primenjen je i Sistem klasifikacije grubih motoričkih funkcija (The Gross Motor Function Classification System – GMFCS).

Rezultati. Rezultati pokazuju da deca tipične populacije imaju statistički značajno veći stepen učestvovanja u porodičnim i rekreativnim aktivnostima, kao i brizi o sebi od dece sa cerebralnom paralizom ($p=0.00$). Deca koja imaju izraženije motoričke smetnje manje učestvuju u porodičnim, rekreativnim aktivnostima i brizi o sebi. Ne postoji statistički značajna razlika u zadovoljstvu pri učestvovanju u aktivnostima svakodnevnog života među decom tipične populacije i dece sa cerebralnom paralizom.

Zaključak. Profesionalci imaju važnu ulogu u smislu definisanja područja tretmana čime doprinose povećanju stepena angažovanja dece sa cerebralnom paralizom u svim domenima funkcionisanja. Uspeh rehabilitacije ne treba meriti samo akademskim postignućima ciljne grupe, već i nivoom samostalnosti u porodičnim i rekreativnim aktivnostima, kao i domenu brige o sebi.

Ključne reči: cerebralna paraliza; dete; porodica; rekreativna terapija; briga o sebi.

ABSTRACT

Objective. Active engagement of children with cerebral palsy in daily life activities is a predictor of general social participation and is crucial for their quality of life. The aim of this study was to determine the frequency of participation of children with cerebral palsy in family and recreational activities and self-care, as well as the level of their enjoyment in those activities.

Method. The study included 50 children aged 7 to 11 years. The experimental group consisted of 25 students with cerebral palsy while the control group encompassed 25 students from the typically developing population. The Child Engagement in Daily Life questionnaire was used in the study. The instrument is intended for parents to describe and evaluate a child's participation in family and recreational activities and self-care. It consists of 18 items. The Gross Motor Function Classification System – GMFCS was also used in the study.

Results. The results show that children from the typically developing population have a significantly higher level of participation in family and recreational activities and self-care than children with cerebral palsy ($p=0.00$). Children with more pronounced motor difficulties participate less in family and recreational activities and self-care. There are no statistically significant differences in levels of enjoyment in activities of daily life between children from the typically developing population and children with cerebral palsy.

Conclusion. Professionals have an important role in defining treatment areas which allows them to contribute to enhancing the level of participation of children with cerebral palsy in all domains of daily life. The success of rehabilitation should not be measured solely by academic achievement of the target group, but also by the level of independence in family and recreational activities as well as self-care.

Key words: cerebral palsy; child; family; recreation therapy; self care.

KORESPONDENCIJA / CORRESPONDENCE

Sanela Slavković, Medicinski fakultet, Hajduk Veljkova 3, 21000 Novi Sad, Tel. 063 77 05 188, E-mail: sanela.slavkovic@mf.uns.ac.rs

Sanela Slavkovic, Faculty of Medicine, Hajduk Veljkova 3, 21000 Novi Sad, Serbia, Phone: +381 63 77 05 188, E-mail: sanela.slavkovic@mf.uns.ac.rs

UVOD

Crebralna paraliza (CP) je trajno stanje, ali ne i nepromenljivo, nastalo oštećenjem centralnog nervnog sistema te predstavlja heterogenu skupinu simptoma, manifestuje se na više organa i sistema,¹ a posledično ograničava razvoj sposobnosti i vodi ka sve većoj potrebi za intenzivnom i kontinuiranom defektološkom podrškom i intervencijom.² Oko 20-30% populacije dece sa CP trpi posledice smanjene pokretljivosti, smanjene mogućnosti brige o sebi i svojim osnovnim životnim potrebama, a prisutna su i ograničenja u domenu socijalne uključenosti.³ Ove osobe kasnije ovladavaju ili ponekad samo delimično ovladavaju aktivnostima svakodnevnog života.

Vorman i saradnici su u svojim istraživanjima došli do rezultata da za učešće u aktivnostima, motoričke sposobnosti predstavljaju važan faktor, koji je značajno povezan sa pokretljivošću i brigom o sebi kod dece sa CP uzrasta 9-13 godina.^{4,5}

Socijalna participacija predstavlja uključenost osobe u realne životne situacije i održava bivstovanje ili rad sa drugima u socijalnom kontekstu.⁶ King i saradnici definišu participaciju kao učešće u formalnim i neformalnim svakodnevnim aktivnostima tokom života, uključujući okruženje za igru, sport, zabavu, učenje i drugo.⁷ Učestvovanje uključuje objektivne komponente kao što su da li dete učestvuje i koliko često učestvuje; kao i subjektivne aspekte, da li dete uživa u toj aktivnosti.⁸

Podrška socijalnog okruženja, uključujući pozitivne stavove i pristupačnost bez arhitektonskih barijera, najčešće se navode kao olakšavajući sredinski faktori angažovanja dece sa CP u svakodnevnim aktivnostima.⁹ Bogatija socijalna mreža omogućava veći obim pozitivnijeg socijalnog iskustva i efikasniji razvoj socijalnog identiteta, što sve ukupno ima blagotvoran uticaj na kvalitet života i životno zadovoljstvo.¹⁰

Deca sa CP imaju manji nivo učestvovanja u velikom broju aktivnosti u različitim oblastima života. Uglavnom su uključeni u pasivne aktivnosti, koje se odvijaju u kućnim uslovima a nivo učešća je niži nego deca tipične populacije.⁸ Razumevanje faktora koji utiču na učestvovanje mogu pomoći pri planiranju usluga i intervencija. Istraživači iz ove oblasti preporučuju podršku od strane grupe vršnjaka da bi povećali socijalnu participaciju dece sa CP.¹¹ Poznato je da porodica nosi najveću odgovornost kada je u pitanju osamostaljivanje deteta sa CP za aktivnosti svakodnevnog života. Majke dece sa CP obezbeđuju dodatnu negu za svoju decu i provode dosta vremena u aktivnostima sa decom.¹² U nekim kulturama,

kao što je npr. Iranska, majke dece sa CP provode više vremena sa njihovom decom nego majke dece tipičnog razvoja.¹³ Stoga je važno analizirati kontekst, pratiti lične i sredinske barijere da bi se olakšala socijalna participacija dece sa CP i njihovih roditelja.

Prioriteti roditelja dece sa CP se menjaju sa karakteristikama razvojnog doba u kom se deca nalaze. Briga o sebi je prioritet za roditelje dece mlađe uzrasne dobi, dok fokus za stariju decu predstavlja socijalizacija sa vršnjacima a prioritet za roditelje adolescenata predstavlja mogućnost da samostalno obavljaju svakodnevne aktivnosti.¹⁴

Igra i učešće u rekreativnim i zabavnim aktivnostima daje deci mogućnosti da se zabave i provode vreme s drugim ljudima. Smatra se da je učešće u igri glavni životni prostor za decu. Zdravstveni i prosvetni radnici ističu važnost igranja za povećanje razvoja deteta, pružajući osećaj majstorstva, potvrđujući self koncept i unapređivanje međuljudskih odnosa.¹⁵ Osnovni faktor u postizanju pune socijalne zrelosti dece sa CP jeste odnos roditelja i količina odgovornosti koju prepuštaju svojoj deci, kao i odgovornost koju deca sa CP imaju u svakodnevnom porodičnom životu.¹⁶ Roditelji prepuštaju sve veću odgovornost deci u skladu sa njihovim razvojnim kapacitetima, i obaveze tokom perioda odrastanja bivaju postepeno sve veće. Samopouzdanje koje se na taj način stekne, dobra je osnova dalje socijalne participacije i sveukupne integracije pojedinca.¹⁷

Cilj istraživanja je ispitati stepen učestvovanja i nivo zadovoljstva dece sa CP u porodičnim, rekreativnim aktivnostima i brizi o sebi.

METODE

Uzorak

Uzorak je činilo 50 učenika, od prvog do četvrtog razreda osnovne škole, koji su podeljeni u dve grupe, eksperimentalnu i kontrolnu. Eksperimentalna grupa (E) je obuhvatila 25 učenika sa CP, dok je kontrolna grupa (K) činila 25 učenika tipične populacije.

Instrumenti

1. Opšti upitnik, koji je konstruisan za potrebe ovog istraživanja sa svrhom prikupljanja opštih podataka o detetu i porodici.

2. Upitnik "Angažovanje deteta u svakodnevnom životu" (Child Engagement in Daily Life) (Chiarello L. i sar., 2013)¹⁵ za čiju primenu je dobijena saglasnost autora.

Upitnik je namenjen roditeljima. Sastoji se iz 18 ajtema. U prvom delu upitnika se nalaze pitanja vezana za učešće u porodičnim i rekreativnim aktivnostima. Ukupno ima 11 pitanja, a za svako pitanje se označava koliko često dete učestvuje u nekoj aktivnosti i koliko roditelji misle da njihovo dete uživa u toj aktivnosti. Pitanja se odnose na porodične aktivnosti kod kuće i van kuće, igranje sa odraslima u kući, igranje sa decom u kući, igranje sa odraslima napolju, igranje sa decom napolju, aktivnosti kao što je bojanje, čitanje knjige, prilagođeni sportovi; potom rekreacije: vožnja bicikla, plivanje, trčanje, penjanje na igralištu i zabavne aktivnostim van kuće kao što je odlazak u park, igraonice za decu, posete koncertima, društvene aktivnosti i odlasci na zabave. Drugi deo upitnika čini 7 pitanja o učestovanju deteta u domenu brige o sebi (hranjenje, oblačenje i slično).

U originalnom upitniku Kromnbahov koeficijent alfa ima vrednost od 0.86 do 0.91, potvrđena je test-retest pouzdanost upitnika a ajtemi pokazuju dobru uklopljenost i logičan hijerarhijski sled.¹⁵ U našem istraživanju, pouzdanost instrumenta na ukupnom uzorku i oba poduzorka je zadovoljavajuća, kako za skalu porodičnih i rekreativnih aktivnosti tako i za skalu brige o sebi, i iznosi =0.70. Inter-ajtem korelacije su niske (od nepostojeće, a neke zadovoljavajuće) i kreću se u opsegu od =0.01-0.68.

3. Sistem klasifikacije grubih motoričkih funkcija (The Gross Motor Function Classification System – GM-FCS)18 klasifikuje sposobnost kretanja osoba sa CP u okviru pet stepeni.

Statistička analiza podataka rađena je u SPSS programu. Analiza podataka je obuhvatila deskriptivnu statistiku i testiranje hipoteza.

REZULTATI

Najveći broj dece iz obe grupe u trenutku ispitivanja pohađali su prvi i drugi razred (Tabela 1). Obe grupe su približno ujednačene po polu. U obe grupe su najviše bile uključene porodice sa dva deteta. Sva deca iz kontrolne grupe stanuju u gradu, dok je šestoro dece sa CP sa sela. U grupi dece sa CP ima sedmoro dece čija porodica ima nezadovoljavajuć socio-ekonomski status, dok u kontrolnoj grupi porodice imaju ili delimično ili potpuno zadovoljavajuć socio-ekonomski status.

Tabela 1. Deskriptina struktura uzorka

Razred	Ukupno	E	K
Prvi	18	9	9
Drugi	20	10	10
Treći	4	2	2
Četvrti	8	4	4
Pol			
Muški	26	13	13
Ženski	24	12	12
Sredina			
Grad	44	19	25
Selo	6	6	0
Socio-ekonomski status			
Nezadovoljavajući	7	7	0
Delimično zadovoljavajući	19	10	9
Zadovoljavajući	24	8	16
Broj dece u porodici			
Jedno	12	8	4
Dvoje	33	15	18
Troje	4	1	3
Četvoro	1	1	0

Rezultati pokazuju da postoji značajna razlika u učestalosti uzimanja učešća u porodičnim i rekreativnim aktivnostima među decom tipične populacije i decom sa CP ($t=3.01$, $p=0.00$) u odnosu na brigu o sebi ($t=14.73$, $p=0.00$) (Tabela 2). Ova razlika je takva da deca tipične populacije značajno češće učestvuju u porodičnim i rekreativnim aktivnostima.

Tabela 2. Razlike u frekvenci u skalama instrumenta "Angažovanje deteta u svakodnevnom životu"

Skala porodičnih i rekreativnih aktivnosti	N	Mean	SD	T-test	p
E	25	53.82	11.43	3.01	0.00
K	25	61.93	7.08		
Skala brige o sebi	N	Mean	SD	T-test	p
E	25	34.35	21.50	14.73	0.00
K	25	98.86	4.13		

Nadalje, naši rezultati ukazuju da su izraženije motoričke smetnje dece sa CP u značajnoj veoma visokoj negativnoj korelaciji sa brigom o sebi ($r=-0.82$, $p=0.00$). Izraženije motoričke smetnje praćene su manjom mogućnošću da dete brine o sebi. Korelacija motoričkih smetnji sa frekvencijom učešća u porodičnim i rekreativnim aktivnostima ($r=0.09$, $p=0.64$), kao i sa zadovoljstvom pri učešću u porodičnim i rekreativnim aktivnostima ($r=-0.05$, $p=0.82$) nije značajna.

Rezultati pokazuju da ne postoji značajna razlika u zadovoljstvu pri učestvovanju u porodičnim i rekreativnim aktivnostima među decom tipične populacije i decom sa CP ($t=1.88$, $p=0.06$).

DISKUSIJA

Aдекватna i potpuna socijalna participacija omogućava da deca sa CP imaju adekvatan razvoj i prelazak u zrelo doba i na kraju da su sposobna za samostalni život. Milićević i saradnici navode da su mnogobrojna istraživanja pokazala da je participacija u svakodnevnim aktivnostima od ključnog značaja za kvalitet života dece sa smetnjama u razvoju i da predstavlja nezamenjiv prediktor adekvatnog razvoja.¹⁹

Prva determinantna učestvovanja dece sa CP u svakodnevnom životu jeste domen brige o sebi. Rezultati našeg istraživanja pokazuju da postoji značajna razlika u brizi o sebi među decom tipične populacije i decom sa CP. Ova razlika je takva da deca tipične populacije značajno više brinu o sebi. Interesatno je navesti podatak iz literature da su funkcionalne veštine u području brige o sebi i socijalnom funkcionisanju, statistički značajno razvijenije kod dece koja žive u porodicama sa višim socio-ekonomskim statusom.²⁰

Rezultati našeg istraživanja ukazuju da deca sa CP imaju manje porodičnih i rekreativnih aktivnosti u odnosu na decu tipične populacije. Ova razlika je takva da deca tipične populacije značajno češće učestvuju u porodičnim i rekreativnim aktivnostima. U ove aktivnosti spadaju porodične aktivnosti kod kuće i van kuće, igranje sa odraslima u kući, igranje sa decom u kući, igranje sa odraslima napolju, igranje sa decom napolju, aktivnosti kao što je bojanje, čitanje knjige, prilagođeni sportovi, rekreacije kao što je vožnja bicikla, plivanje, trčanje, penjanje na igralištu, zabavne aktivnosti van kuće kao što je odlazak u park, igraonica za decu, koncerti, društvene aktivnosti, odlasci na zabave.

Participacija manjeg intenziteta dece sa CP u odnosu na vršnjake u sportskim, kulturnim i slobodnim aktivnostima zabeležili su Ims i saradnici.²¹ Da deca sa CP ređe učestvuju u porodičnim i rekreativnim aktivnostima i da im je potrebno mnogo više pomoći da se brinu sami o sebi nego deci bez CP, potvrđuje i naše istraživanje Lisa A. Chiarello i saradnika.¹⁵

Deca koja imaju izraženije motoričke smetnje manje učestvuju u porodičnim, rekreativnim aktivnostima i brizi o sebi. Najznačajniji je domen brige o sebi te rezultati našeg istraživanja potvrđuju da su izraženije motoričke smetnje dece sa CP u značajnoj veoma visokoj negativnoj korelaciji sa brigom o sebi. Ovakav nalaz može da se objasni poteškoćama koje CP ostavlja na lokomotorni sistem.²² Slične rezultate su dobili Donkervurt i saradnici, koji tvrde da je nivo motoričkog funkcionisanja najznačajnija

determinanta socijalnog uključivanja, odnosno viši nivo motoričkog funkcionisanja predstavlja manja ograničenja u svim domenima svakodnevnih aktivnosti.²³

Stepen zadovoljstva pri učešću u porodičnim i rekreativnim aktivnostima isti je kao kod dece tipične populacije. To je vrlo značajan i ohrabrujući podatak. U skladu je sa drugim istraživanjima.¹⁵ Mogućnost da se učestvuje u svim aspektima života je determinanta kvaliteta života dece sa CP i zbog toga treba biti praćena. Ovo je preporuka za sve sa invaliditetom za koje se zna da su u riziku da njihovo učešće bude ograničeno.⁸

Programi edukacije i (re)habilitacije i tretmana dece sa CP u svetu i kod nas se razlikuju. Zsigurno da je potrebno unapređivati iste da bi funkcionalni ishodi bili bolje. Takođe, preporučuje se da sastavni deo svih tretmana (defektoloških i drugih) bude i obuka dece za CP za adekvatno korišćenje slobodnog vremena.²⁴

ZAKLJUČAK

Profesionalci koji se bave edukacijom i (re)habilitacijom dece sa CP imaju važnu ulogu u smislu procene i tretmana čime doprinose povećanju stepena angažovanja dece sa CP i dostizanju maksimalno mogućeg nivoa funkcionisanja u svim domenima. Uspeh rehabilitacije ne treba meriti samo akademskim postignućima ciljne grupe, već i nivoom samostalnosti u porodičnim i rekreativnim aktivnostima, kao i domenu brige o sebi.

LITERATURA

1. Ferrari A, Cioni G. The spastic forms of cerebbral palsy-a guide to the assessment of adaptive functions. Dordrecht: Springer, 2010.
2. Gojčeta M, Joković Oreb I, Pinjatela R. Neki aspekti kvalitete života adolescenata sa i bez cerebralne. Hrvatska revija za rehabilitacijska istraživanja 2008; 44: 39-47.
3. Nedović G, Rapaić D, Odović G, Potić S, Milićević M. Socijalna participacija osoba sa invaliditetom. Beograd:Društvo defektologa Srbije, 2012.
4. Voorman JM, Dallmeijer AJ, Schuengel C, Knol DL, Lankhorst GJ, Becher JG. Activities and participation of 9- to 13-year-old children with cerebral palsy. Clin Rehabil 2006; 20: 937-48.

5. Voorman JM, Dallmeijer AJ, Knol DL, Lankhorst GJ, Becher JG. Prospective longitudinal study of gross motor function in children with cerebral palsy. *Arch Phys Med Rehabil* 2007; 88: 871-6.
6. World Health Organization. International Classification of Functioning, Disability and Health (ICF). Geneva: World Health Organization, 2001.
7. King G, Law M, King S, Rosenbaum P, Kertoy M, Young N. A conceptual model of the factors affecting the recreation and leisure participation of children with disabilities. *Phys Occup Ther Pediatr* 2003; 23: 63-90.
8. Parkes J, McCullough N, Madden A. To what extent do children with cerebral palsy participate in everyday life situations? *Health Soc Care Community* 2010; 18: 304-15.
9. Lawlor K, Mihaylov S, Welsh B, Jarvis S, Colver A. A qualitative study of the physical, social and attitudinal environments influencing the participation of children with cerebral palsy in northeast England. *Pediatr Rehabil* 2006; 9: 219-28.
10. Miller S, Chan F. Predictors of life satisfaction in individuals with intellectual disabilities. *J Intellect Disabil Res* 2008; 52: 1039-47.
11. Bjornson KF, Belza B, Kartin D, Logsdon RG, McLaughlin J. Self-reported health status and quality of life in youth with cerebral palsy and typically developing youth. *Arch Phys Med Rehabil* 2008; 89: 121-7.
12. Gevir D, Goldstand S, Weintraub N, Parush S. A comparison of time use between mothers of children with and without disabilities. *OTJR: Occupation, Participation and Health* 2006; 26: 117-27. (doi:10.1177/153944920602600305).
13. Rassafiani M, Ahmadi Kahjugh M, Hoseini SA, Sahaf R. Time use in mothers of children with cerebral palsy: a comparison study. *Hong Kong Journal of Occupational Therapy* 2012; 22: 70-4. (doi: 10.1016/j.hkjot.2012.11.001).
14. Chiarello AL, Palisano JJ, Maggs JM, Orlin NM, Almasri N, Kang L, Chang H. Family priorities for activity and participation of children and youth with cerebral palsy. *Phys Ther* 2010; 90: 254-64.
15. Chiarello AL, Palisano JR, Westcott McCoy S, Bartlett JD, Wood A, Chang H, Kang L, Avery L. Child engagement in daily life: a measure of participation for young children with cerebral palsy. *Disabil Rehabil* 2014; 36: 1804-16.
16. Bottcher L. Children with spastic cerebral palsy, their cognitive functioning, and social participation: a review. *Child Neuropsychol* 2010; 16: 209-28.
17. Banjac L, Nikolić S. Socijalna i emocionalna zrelost za polazak u školu dece sa cerebralnom paralizom. *Specijalna edukacija i rehabilitacija* 2011; 10: 179-91.
18. Palisano R, Rosenbaum P, Walter S, Russell D, Wood E, Galuppi B. Development and reliability of a system to classify gross motor function in children with cerebral palsy. *Dev Med Child Neurol* 1997; 39: 214-23.
19. Milićević M, Potić S, Trgovčević S. Socijalna participacija dece sa cerebralnom paralizom u porodičnom i vršnjačkom okruženju. Zbornik radova Prvog međunarodnog skupa studenata specijalne edukacije i rehabilitacije „Specijalna edukacija i rehabilitacija“, Beograd, 15-18. 04. 2011. Beograd, 2011: 44- 52.
20. Glinac A, Dealčić A, Matović L. Kvalitet života dece sa cerebralnom paralizom prema vlastitoj proceni i proceni roditelja. *Specijalna edukacija i rehabilitacija* 2015; 14: 193-209.
21. Imms C. Children with cerebral palsy participate: a review of the literature. *Disabil Rehabil* 2005; 30: 1867-84.
22. Bult MK, Verschuren O, Lindeman E, et al. Predicting leisure participation of school-aged children with cerebral palsy: longitudinal evidence of child, family and environmental factors. *Child Care Health Dev* 2013; 39: 374-80.
23. Donkervoort M, Roebroek M, Wiegerink D, van der Heijden-Maessen H, Stam H; Transition Research Group South West Netherlands. Determinants of functioning of adolescents and young adults with cerebral palsy. *Disabil Rehabil* 2007; 29: 453-63.
24. King G1, Imms C, Palisano R, Majnemer A, Chiarello L, Orlin M, Law M, Avery L. Geographical patterns in the recreation and leisure participation of children and youth with cerebral palsy: a CAPE international collaborative network study. *Dev Neurorehabil* 2013; 16: 196-206.

Correlating household second-hand smoke exposure and respiratory symptoms in school children

Korelacija između izloženosti pasivnom pušenju u kućnom okruženju i pojave respiratornih simptoma kod školske dece

Branislava Matic¹, Dragana Vujanovic², Snezana Dejanovic¹, Verica Jovanovic¹, Nela Djonovic³

1. Institute of Public Health of Serbia, Belgrade, Serbia

2. Faculty of Pharmacy, Belgrade University, Serbia

3. Faculty of Medical Sciences, University of Kragujevac, Serbia

Branislava Matić¹, Dragana Vujanović², Snežana Dejanović¹, Verica Jovanović¹, Nela Džonović³

1. Institut za javno zdravlje Srbije, Beograd, Srbija

2. Farmaceutski fakultet, Beogradski Univerzitet, Beograd, Srbija

3. Fakultet medicinskih nauka Univerziteta u Kragujevcu, Kragujevac, Srbija

RECEIVED 15.07.2017.

ACCEPTED 15.11.2017.

PRIMLJEN 15.07.2017.

PRIHVAĆEN 15.11.2017.

ABSTRACT

Objective. Aim of this paper was to correlate exposure to household second-hand smoke and respiratory symptoms in participating school children, who are attending ten primary schools in Belgrade, Serbia.

Method. In order to determine correlation between second-hand smoke exposure at home and respiratory symptoms in primary school pupils, a comparative cross-sectional study has been conducted. The study was conducted in ten primary schools on 735 children, in 44 classrooms in Belgrade, Serbia. A standardized questionnaire was distributed to parents/care-givers, on child's respiratory health, socioeconomic status and parents' lifestyle habits, primarily cigarette smoking.

Results. 78% of all exposed children have parents smoking up to 20 cigarettes/day, while more than 22% are exposed to parents' household second-hand smoke of more than 21 cigarettes per day ($p < 0.0001$). Respiratory disorders appear in 45.9% of children exposed to domestic second-hand smoke (CI 1.04–1.89), asthmatic symptoms in 33.5% (CI 0.94–1.78), while the least incidence of disorders is reported for continuous cough, which have lasted for 3 months (3.3%, CI 0.44–2.36), wheezing after exercise (4.5%, CI 0.38–1.41) and being awoken by wheezing in last 12 months (7.4%, CI 0.89–3.28).

Conclusion. Univariate logistic regression analysis proved that parental smoking exposure is a statistically significant predictor for childhood respiratory symptoms' manifestation.

Key words: tobacco smoke pollution; child; signs and symptoms, respiratory.

APSTRAKT

Cilj. Cilj ovog rada je uspostavljanje korelacije između izloženosti pasivnom pušenju u kućnom okruženju i pojave respiratornih simptoma kod dece koja pohađaju deset osnovnih škola u Beogradu, Srbija.

Metod. Istraživanje je sprovedeno po tipu komparativne studije preseka, u deset osnovnih škola, na uzorku od 735 dece, u 44 učionice, u Beogradu, Srbija. Roditeljima/starateljima distribuiran je standardizovani upitnik, sa pitanjima o respiratornom zdravlju dece, socio-ekonomskom statusu i navikama roditelja, pre svega o pušenju cigareta.

Rezultati. 78% dece koja su izložena duvanskom dimu ima roditelje koji puše do 20 cigareta/dan, dok je više od 22% izloženo duvanskom dimu od popušenih preko 21 cigareta/dan, od strane roditelja ($p < 0.0001$). Respiratorni poremećaji prisutni su kod 45,9% dece izložene pasivnom pušenju u kućnom okruženju (CI 1.04-1.89), astmatični simptomi kod 33,5% (CI 0,94-1,78), dok je najniža incidenca ovih poremećaja prijavljena u slučaju hroničnog kašlja, u trajanju od 3 meseca (3,3%, CI 0,44-2,36), vizinga nakon fizičke aktivnosti (4,5%, CI 0,38-1,41), kao i za slučaj buđenja usled viziga u poslednjih 12 meseci (7,4%, CI 0,89-3,28).

Zaključak. Univarijantnom logističkom regresionom analizom dokazano je da je izloženost roditeljskom pušenju duvana statistički značajan prediktor za pojavu respiratornih simptoma kod dece.

Ključne reči: zagađenje duvanskim dimom; dete; znači i simptomi, respiratorni.

KORESPONDENCIJA / CORRESPONDENCE

Branislava Matic, Institute of Public Health of Serbia, Dr Subotića 5, 11000, Belgrade, Serbia, E-mail: brankicam@batut.org.rs

Branislava Matić, Institut za javno zdravlje Srbije, Dr Subotića 5, 11000, Beograd, E-mail: brankicam@batut.org.rs

INTRODUCTION

Second/hand smoke refers to mixture of side stream smoke and exhaled mainstream smoke which pollutes air at points where tobacco smoking is being performed.¹ To date, beyond 4,000 chemicals, comprising a combination of liquids, inhalable particles, and gases are identified in tobacco smoke. Among 4000 chemicals, more than 70 of them are recognized to cause, initiate or promote cancer.^{2,3} World Health Organization assess that around 1.3 billion people smoke.⁴ This number is predicted to increase in future due to continuous rise of smoking rates among youth, primarily among girls.⁵ According to the World Health Organization assessment, some half of the children in the world are exposed to environmental tobacco smoke (ETS), mostly in their homes. This caused substantial morbidity, potentially triggering development of asthma and exacerbating symptoms.⁶⁻¹² Children exposed to ETS are at an increased risk for lower respiratory infections, middle ear disease, more severe asthma, respiratory symptoms, slowed lung growth, and sudden infant death syndrome.^{13,14}

METHODS

Within the international SEARCH1 project (School Environment and Respiratory Health in Children, 2007-2009), a cross-sectional study took place in ten primary schools in Belgrade, Serbia. Study was performed on a sample of total of 735 children, aged 7 to 11 years. According to the project's methodology, schools were chosen (sampled) to be with heterogeneous characteristics: half of them in environmentally more advantaged areas and half in less advantaged ones, especially concerning the proximity of busy traffic, while children were chosen randomly.¹⁵ Besides the school's environment impact on respiratory health, we also used the data on home environment, household exposure to second-hand smoke, particularly, obtained through a standardized questionnaire distributed to parents/caregivers of the participating children (N=735). Concerning home environment of children, key questions in our study were on the extent of exposure to ETS of children, number of cigarettes smoked by parents on daily basis, number of smokers in the household (mother, father, or both), as well as on the respiratory status of children. These questions included data on wheezing, cough, and diagnosis of asthma.¹⁵

Statistical methodology

In order to summarize baseline, demographic and clinical symptoms and characteristics, of two groups of schoolchildren (exposed and non-exposed), a descrip-

tive statistics was used. Chi-square test was used for the comparison of categorical variables. For the comparison of continuous variables, an ANOVA-test, or Median test (for variables without normal distribution) were used. A significance of 0.05 was required. Odd ratios with the corresponding 95% confidence intervals (CI) were estimated. In order to determine the optimal cut off values of the daily smoked number of cigarettes in relation to the occurrence of respiratory disorders, ROC (Receiver Operating Characteristic) curve was used. For the estimation of predictor impact of ETS on health disorders in children, univariate logistic regression analysis (LRA) was used. Analyses were performed using SPSS for Windows version 22 (SPSS, Inc, Chicago, IL).

This study aimed to determine the prevalence of household ETS exposure in school children in Belgrade, Serbia, as well as the association between ETS exposure and respiratory symptoms among them.

RESULTS

This study has involved 735 students from 10 Belgrade primary schools, 364 (49.5%) girls and 371 (50.5%) boys. There is no statistically significant difference among exposed and non-exposed children, by age. Mean age of mothers of the participating children was from 38.93 ± 5 years for non-ETS exposed children to 37.42 ± 5.57 years for ETS exposed children. Mothers exposing their children to ETS at home are significantly younger than mothers taking care not to expose their offspring ($p \leq 0.0001$). Fathers' mean age ranged from 42.32 ± 5.86 years for non-ETS exposed children to 41.65 ± 6.17 years for ETS exposed children. Again, as in the case of mothers, fathers exposing their children to household ETS are much younger, with high statistical significance ($p \leq 0.013$). (Table 1).

Table 1. Demographic data on children and parents

	ETS	N	Mean Mean	SD	95% Confidence Interval for Mean		Min	Max	F sign
					Lower Bound	Upper Bound			
AGE	No	315	9.70	0.95	9.59	9.80	0.00	11.00	0.606
	Yes	408	9.73	0.76	9.65	9.80	8.00	11.00	
	Total	723	9.71	0.85	9.65	9.78	0.00	11.00	
Mothers' age	No	308	38.93	5.00	38.37	39.49	27	57	0.0001
	Yes	399	37.42	5.57	36.87	37.96	19	55	
	Total	707	38.07	5.38	37.68	38.47	19	57	
Fathers' age	No	296	42.32	5.86	41.65	42.99	30	62	0.013
	Yes	388	41.14	6.36	40.50	41.77	29	72	
	Total	684	41.65	6.17	41.19	42.11	29	72	

To household ETS 412 pupils were exposed (56.2%), while the rest of them 321 (43.8%) were not exposed to this indoor air pollutant. Parents of the participating children smoke from 7.65 ± 11.25 to 12.66 ± 15.50 cigarettes/day (Table 2).

Table 2. Cigarettes/day smoked by parents correlated to household ETS of school children

Smoking habits	Total		Not exposed to ETS		Household ETS		x ²	sig
Mothers	N	%	N	%	N	%		
No smoking	321	43.8	321	100.0	0	0.0	733.00***	0.0001
Smoke 1-5 / day	68	9.3	0	0.0	68	100.0		
Smoke ≥ 6 /day	344	46.9	0	0.0	344	100.0		
Total	733	100.0	321	43.8	412	56.2		
Fathers	N	%	N	%	N	%	x ²	sig
No smoking	321	43.8	321	100.0	0	0.0	728.95***	0.0001
1-10 /day	196	26.7	0	0.0	196	47.6		
11-20 /day	124	16.9	0	0.0	124	30.1		
≥ 21 /day	92	12.6	0	0.0	92	22.3		
Total	733	100.0	321	43.8	412	56.2		

Concerning the age distribution, no statistically significant difference among exposed and non-exposed children has been proven. As for their parents, both mothers ($p < 0.0001$) and fathers ($p < 0.013$) of children exposed to ETS at home are significantly younger than parents of non-exposed children. Number of cigarettes per day smoked by parents ranges from 7.65 ± 11.25 to 12.66 ± 15.50 . As proved in this study, parents of most of the ETS exposed children smoke ≥ 6 cigarettes/day ($p < 0.0001$). Namely, 78% of all exposed children have parents smoking up to 20 cigarettes/day, while more than 22% is exposed to parents' household second-hand smoke of more than 21 cigarettes per day ($p < 0.0001$).

Children exposed to tobacco smoke are more often prone to respiratory disorders, allergy and asthma diagnosis, as shown in Table 3.

Table 3. Symptoms and disorders correlated to household ETS of school children

Respiratory symptoms	Exposed to ETS				Non-exposed to ETS				x2	LRA Exp (B)	(95%) C.I.
	Yes		No		Yes		No				
	N	%	N	%	N	%	N	%			
Cough ever	95	23.7	306	76.3	63	20.1	251	79.9	1.346	1.237	0.86-1.77
Morning cough (autumn/winter)	45	11.3	355	88.7	32	10.2	282	89.8	0.205	1.117	0.69-1.80
Cough day/ night, (autumn /winter)	45	11.2	356	88.8	28	8.9	288	91.1	1.077	1.300	0.79-2.14
Continuous cough 3 months (autumn/winter)	13	3.3	384	96.7	10	3.2	302	96.8	0.003	1.022	0.44-2.36
Phlegm	39	9.7	362	90.3	30	9.6	284	90.4	0.006	1.020	0.62-1.68
Wheezing ever	96	23.6	310	76.4	58	18.6	253	81.4	2.606	1.351	0.94-1.95
Dry cough last 12 months	60	14.7	347	85.3	42	13.3	273	86.7	0.290	1.124	0.74-1.72
Woken by wheezing in last 12 months	30	7.4	375	92.6	14	4.5	299	95.5	2.643	1.709	0.89-3.28
Ever Dg asthma	55	13.5	351	86.5	39	12.5	272	87.5	0.157	1.093	0.70-1.70
Asthma therapy /last 12 months	39	9.6	368	90.4	29	9.3	282	90.7	0.014	1.031	0.62-1.52
Allergy	88	23.7	283	76.3	64	22.9	216	77.1	0.066	1.049	0.73-1.52
Ever Dg allergy	77	18.7	335	81.3	51	15.9	270	84.1	0.939	1.217	0.83-1.79
Symptoms of bronchitis	95	23.1	317	76.9	63	19.6	258	80.4	1.257	1.227	0.86-1.76
Asthmatic symptoms	138	33.5	274	66.5	90	28.0	231	72.0	2.508	1.293	0.94-1.78
Respiratory disorders	189	45.9	223	54.1	121	37.7	200	62.3	4.946	1.401	1.04-1.89

For a series of respiratory symptoms there is a higher probability to develop, than in children not exposed to ETS at home, in the following order: cough ever 12.7%; morning cough in autumn/winter season 12.0%; cough day and night in autumn/winter season 30%; continuous cough during 3 months in autumn/winter season 2.2; continuous cough during 3 months in autumn/winter season, combined with phlegm 2.0%; wheezing ever 35.1%.

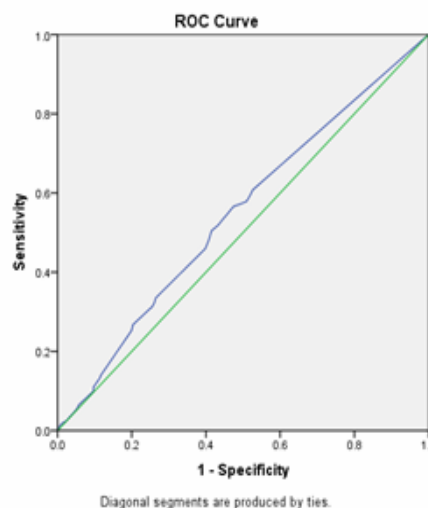
Development of the listed symptoms and disorders has a higher probability in ETS exposed children: "dry cough during 12 months", for 12.4%; "awakened by wheezing during last 12 months", for 71%; "cough ever combined with ever diagnosed asthma", for 9.3%; "asthma therapy in last 12 months", for 3.1%; "cough ever combined with ever diagnosed allergy", for 22%; "ever diagnosed allergy", for 5%.

Number of school children being exposed to household ETS, acquiring respiratory disorders is proven to be more frequent, with high statistical significance ($p < 0.026$). For all of these symptoms and disorders linked mostly to coughing per se, exposure to household ETS is not a predictor (univariate logistic regression analysis), with no statistically significant difference in the distribution of participating pupils, compared to the symptoms or the exposure itself (χ^2 test).

Probability for "cough ever" to occur is 23.7% higher in children exposed to ETS (OR=1.237, CI 95% 0.86-1.77); for "morning cough in autumn/winter season" it is 11.7% higher, (OR=1.117, CI 95% 0.69-1.80), "cough day and night in autumn/winter season" in ETS exposed subjects is 30% higher, (OR=1.300, CI 95% 0.79-2.14); for "continuous cough for 3 months during autumn/winter season" in children exposed to ETS, chance to acquire it is only 2.2% higher, (OR=1.022, CI 95% 0.44-2.36); "wheezing ever" occurs with probability of 35% in ETS exposed children (OR=1.351, CI 95% 0.94-1.95). There is a higher probability for developing following symptoms and disorders in ETS exposed children: "dry cough during 12 months" (OR=1.124, CI 95% 0.74-1.72); "awakened by wheezing during last 12 months", (OR=1.709, CI 95% 0.89-3.28); "ever diagnosed asthma", (OR=1.093, CI 95% 0.70-1.70); "asthma therapy in last 12 months", (OR=1.031, CI 95% 0.62-1.52); "ever diagnosed allergy", (OR=1.217, CI 95% 0.83-1.79); symptoms of bronchitis, (OR=1.227, CI 95% 0.86-1.76); asthmatic symptoms (OR=1.293, CI 95% 0.94-1.78).

Exposure to ETS is a predictor for respiratory disorders. Namely, probability for the household second-hand smoke exposed children to acquire some of the respiratory disorders, analyzed in total, is 40% higher than in the case of ETS non-exposed children, participating in the study (OR=1.401, CI 95% 1.04 - 1.89), $p < 0.023$.

Additional ROC analysis of sensitivity and specificity of the respiratory disorders' occurrence vs. the ETS exposure at home, in the form of the daily smoked number of cigarettes, proves that ROC curve covers a statistically significant area under the curve, ROC=0.547 $\pm$ 0.021, $p < 0.031$ (Graph 1, Table 4). In the case of school children exposed to household ETS, number of cigarettes smoked by parents daily (>10) has statistically significant impact on the occurrence of respiratory disorders. This data is confirmed in results of the correlation in between ETS and respiratory symptoms of exposed children, presented in Table 3.



Graph 1. CiROC curve - respiratory disorders vs. number of cigarettes smoked by parents/day

Table 1. Elements defining the ROC curve

Area Under the Curve				
Test Result Variable(s): Number of cigarettes/day				
Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.547	0.021	0.031	0.504	0.589
	Cut off values			
Cut off	Sensitivity	Specificity		
1.5	59.80%	47.90%		
6.5	50.50%	58.50%		
11	33.40%	73.60%		
15.5	26.70%	79.70%		
21	13.80%	88.40%		

ROC analysis of sensitivity and specificity shows that exposure to larger number of cigarettes per day is related with occurrence of respiratory symptoms in children, with statistical significance. For exposure to < 2 cigarettes/day, sensitivity for the occurrence of respiratory disorders is 60%, specificity 47.9%; for >6 cigarettes/day, sensitivity is 50.5% specificity 58.5%; for exposure to >10 cigarettes/day, sensitivity drops below 35%, while for more than 15/day sensitivity drops below 27% and specificity increases to 80%, together with a rise in specificity beyond 88% for the occurrence of respiratory symptoms in the case children are exposed to ETS of > 20 cigarettes/day.

DISCUSSION

For better comprehension of the correlation between ETS and respiratory symptoms, it is important to be acquainted with other contributing factors. In their study, Oberg et al. indicated that exposure to ETS is among the most common indoor pollutants.¹⁶ While in our study household second-hand smoke of both parents complies with their smoking habits in 56.2% cases, in the Jordanian study out of 77% parents with smoking habits, them 61% practice it at home.¹⁷ According to the World Health Organization (WHO), over half of all children aged 13-15 years are exposed to household ETS in the majority of countries, for which comparable information is available. In the Balkans and the Caucasus, exposure is beyond 90%.¹⁸ The Global Youth Tobacco Survey was implemented only in the Southern Europe Countries, the Balkans and Caucasus, together with the Baltic countries, for the period 2002-2005 (GYTS). In Serbia, 97% of surveyed children were exposed to household ETS.¹⁹ When the same survey has been repeated in 2013, results showed a rather big improvement, with 63.4% surveyed children responding positively as being exposed to ETS at home.²⁰ As for other kinds of chemical substance exposures in school environment, fact is that most of the urban schools in Serbia were built and equipped by uniform standards, given in the Rulebook defining standards for the school environment, equipment and educational utensils in primary schools.²¹

In conclusion, univariate logistic regression analysis has proved that exposure to ETS is a statistically significant predictor for respiratory symptoms' occurrence. In this survey, chances that children who are exposed to household ETS have manifested any of listed respiratory symptoms are 40% higher than in the children not exposed to ETS in their home.

Until now, Serbian legal system has recognized only second-hand exposure to ETS in institutional facilities, public spaces, such as shopping areas, educational premises, offices, while there is no legal act dealing with living conditions within the private property, such as homes, apartments, and other locations where children could be exposed to environmental tobacco smoke.²² Finally, Serbia has legally adopted Children's Environmental Health Action Plan for 2010 – 2019, which was never to be implemented in practice.²³

ACKNOWLEDGMENTS

The financial support for the SEARCH1 project by the Italian Ministry for the Environment, Land and Sea is highly appreciated by the authors.

REFERENCES

1. Samet JM. Workshop summary: Assessing exposure to environmental tobacco smoke in the workplace. *Environ Health Perspect* 1999; 107 (Suppl.2): 309-12.
2. How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease. A Report of the Surgeon General. Centers for Disease Control and Prevention (US); National Center for Chronic Disease Prevention and Health Promotion (US); Office on Smoking and Health (US). Atlanta (GA): Centers for Disease Control and Prevention (US), 2010.
3. Hecht SS. Research opportunities related to establishing standards for tobacco products under the family smoking prevention and tobacco control act. *Nicotine Tob Res* 2012; 14: 18-28.
4. Brower V: World Health Organization focuses on antitobacco efforts in developing nations through treaty. *J Natl Cancer Inst* 2006; 98: 667-8.
5. Warren CW, Jones NR, Peruga A, Chauvin J, Baptiste JP, Costa de Silva V, et al. Global youth tobacco surveillance, 2000-2007. *MMWR Surveill Summ* 2008; 57: 1-28.
6. Beasley R, Crane J, Lai CK, Pearce N. Prevalence and etiology of asthma. *J Allergy Clin Immunol* 2000; 105(2 Pt 2): S466-72.
7. Cook DG, Strachan DP. Health effects of passive smoking. 3. Parental smoking and prevalence of respiratory symptoms and asthma in school age children. *Thorax* 1997; 52: 1081-94.
8. Gilliland FD, Berhane K, Islam T, Wenten M, Rappaport E, Avol E, et al. Environmental tobacco smoke and absenteeism related to respiratory illness in schoolchildren. *Am J Epidemiol* 2003; 157: 861-9.
9. Gilliland FD, Li YF, Peters JM. Effects of maternal smoking during pregnancy and environmental tobacco smoke on asthma and wheezing in children. *Am J Respir Crit Care Med* 2001; 163: 429-36.
10. Martinez FD, Cline M, Burrows B. Increased incidence of asthma in children of smoking mothers. *Pediatrics* 1992; 89: 21-6.
11. Rushton L, Courage C, Green E. Estimation of the impact on children's health of environmental tobacco smoke in England and Wales. *J R Soc Promot Health* 2003; 123: 175-80.

12. Cabana MD, Birk NA, Slish KK, Yoon EY, Pace K, Nan, et al. Exposure to Tobacco Smoke and Chronic Asthma Symptoms. *Pediatr Asthma Allergy Immunol* 2005; 18: 180-8.
13. Moritsugu KP. The 2006 Report of the Surgeon General: the health consequences of involuntary exposure to tobacco smoke. *Am J Prev Med* 2007; 32: 542-3.
14. Mannino DM, Siegel M, Husten C, Rose D, Etzel R. Environmental tobacco smoke exposure and health effects in children: results from the 1991 National Health Interview Survey. *Tob Control* 1996; 5: 13-8.
15. Eva Csobod E, Peter Rudnai P, Vaskovi E, eds. School Environment and Respiratory Health of Children (SEARCH). International research project report within the "Indoor air quality in European schools: Preventing and reducing respiratory diseases program". Szentendre, 2010. (http://search.rec.org/search1/doc/SEARCH%20publication_EN_final.pdf)
16. Oberg M, Jaakkola M, Woodward A, Perug A, Prüss-Ustün A. Worldwide burden of disease from exposure to second-hand smoke; Retrospective analysis of data from 192 countries. *Lancet* 2011; 337: 139-46.
17. AL Ali N, Alhamdan Z, Almughrabi N. The health consequences of second-hand smoke exposure on asthma and respiratory health of school children in Jordan. *Nursing and Health* 2015; 3: 39-46.
18. World Health Organization. Exposure of children to second-hand tobacco smoke. Factsheet 3.4; Geneva: World Health Organization, 2009. (http://www.euro.who.int/__data/assets/pdf_file/0020/97004/3.4-Exposure-of-children-to-second-hand-smoke-EDITED_layouted.pdf?ua=1)
19. World Health Organization. Tobacco Free Initiative (TFI). Global youth tobacco survey (GYTS). Geneva: World Health Organization, 2017. (<http://www.who.int/tobacco/surveillance/gyts/en/>)
20. Serbia 2013 Country Report, Global Youth Tobacco Survey (GYTS). Belgrade: Ministry of Health of the Republic of Serbia, Institute of Public Health of Serbia, 2014. (http://www.batut.org.rs/download/publikacije/2014gytS_SerbiaReport.pdf)
21. Rulebook on the standards for the school environment, equipment and educational means for primary schools. Belgrade: Official Gazette of the SRS – Education-al Gazette No. 4/90, 1990. (in Serbian).
22. Law on protection from exposure to tobacco smoke. Belgrade: Official Gazette RS, No. 30/2010, 2010. (in Serbian).
23. Children's Environmental Health Action Plan for 2010 – 2019. Belgrade: Official Gazette RS, No. 83/09, 2009. (in Serbian).

Effect of stress and professional burning on moral and ethical values in physiotherapy profession

Uticaj stresa i profesionalnog sagorevanja na moralne i etičke vrednosti u profesiji fizioterapeuta

Stevan Jovanovic, Biljana Stojanovic

Higher Education School of Professional Health Studies, Belgrade, Serbia

RECEIVED 06.03.2017.

ACCEPTED 16.05.2017.

Stevan Jovanović, Biljana Stojanović

Visoka zdravstvena škola strukovnih studija u Beogradu

PRIMLJEN 06.03.2017.

PRIHVAĆEN 16.05.2017.

ABSTRACT

The principles of rehabilitation are based on holistic medicine considering physical, mental and social aspects of the patient. In recent decades, we have witnessed intensive changes through the entire medical profession, that are caused by the tremendous advances in science and technology. The communication process between therapist - patient, and between all members of the medical team requires sensitivity to the problems of the patient. It includes honesty, empathy, active listening, patience and also represent the guidelines for successful communication that are necessary for the creation of mutual trust. The state of disease and disability changes every man and reinforces a sense of personal weakness. The patient that is faced with the weakness, needs words of comfort and accepts the help of another person. For a better understanding of the patient's suffering and fears in a therapeutic procedure, it is necessary to activate the empathic power primarily achieve high quality communication with the patient. Communication in medicine is considered as a core skill. Knowledge and good communication skills are a prerequisite for quality work for many professions, especially medicine. According to numerous studies, physiotherapists are primary candidates for combustion at work because of close contact with customers in the work of physiotherapy. Physical therapists, who experience burning, feel helpless in their ability to help others, and can not create a quality relationship with their patients. The resulting changes are loss of empathy and ethical values that were most important features of health services for many decades.

Key words: stress, psychological; physical therapy modalities; psychology, social.

APSTRAKT

Rehabilitacioni principi se temelje na holističkoj medicini te sagledavaju pacijenta s fizičkog, mentalnog i socijalnog aspekta. Poslednjih decenija svedoci smo intenzivnih promena, koje su uzrokovane strahovitim napretkom nauke i tehnologije kroz koje prolazi celokupna medicinska struka a samim tim i fizioterapeutska struka. Komunikacijski proces na relaciji fizioterapeut - pacijent, kao i između svih članova medicinskog tima zahteva osetljivost za probleme pacijenta, iskrenost, empatiju, aktivno slušanje i strpljivost. Navedene osobine ujedno predstavljaju i smernice uspešne komunikacije koje su nužne za stvaranje međusobnog poverenja sa bolesnikom. Bolesnik suočen sa slabošću traži reči utehe i prihvata pomoć druge osobe. Za bolje razumevanje pacijentovih patnji i strahova u fizioterapijskom postupku nužno je aktivirati empatijske snage koje prvenstveno ostvarujemo kvalitetnom komunikacijom sa bolesnikom. Komunikacija u medicini smatra se osnovnom veštinom. Znanje i veštine kvalitetne komunikacije preduslov su kvalitetnog rada za mnoge profesije, posebno u medicini. Prema brojnim studijama fizioterapeuti su primarni kandidati za sagorevanje na poslu zbog bliskog kontakta u radu s korisnicima fizioterapije. Fizioterapeuti, koji iskuse sagorevanje, osećaju se bespomoćno u svojoj sposobnosti da pomognu drugima, osećaju umor te ne mogu stvoriti kvalitetnu vezu sa svojim pacijentima. Nastale promene u vremenu u kome živimo su i osetni gubitak etičkih vrednosti koje su bile najvažnija karakteristika zdravstvene službe mnogo decenija.

Ključne reči: stres, psihološki; modaliteti fizikalne terapije; psihologija, socijalna.

KORESPONDENCIJA / CORRESPONDENCE

Stevan Jovanovic, Drinčiceva 11a/66, 11000 Beograd, Serbia, Phone: +381 69 19 10 884, E-Mail:jovanovicstevan@gmail.com

Stevan Jovanović, Drinčiceva 11a/66, 11000 Beograd, Tel. +381 69 19 10 884, E-Mail:jovanovicstevan@gmail.com

INTRODUCTION

Physiotherapy is an area of physical medicine and rehabilitation and involves the diagnosis and resolution of dysfunction of motion and strengthening physical and functional abilities; restoration and maintenance of optimal physical functioning, optimum physical skills and optimal quality of life in relation to the movement, and health; and to prevent the onset of symptoms and progress impairment, functional limitations, disability that may arise disease, irregular functioning, different states or injuries.¹ The importance of rehabilitation medicine and the physiotherapists is coming increasingly to the fore because of the increasing number of people of all ages with a variety of chronic and degenerative diseases, disabilities, disability or invalidity.² The physiotherapist has a responsibility for the implementation of the physiotherapy, and must have knowledge and skills that allow him to set up a functional diagnosis and determine the physical therapy intervention. The physical therapist must also possess knowledge and skills that enable successful communication with the patient, his family and other members of the professional team.³ Also, he is maintaining the documentation on the forms of intervention and application parameters, as well as direct consequences of any intervention in the evaluation of functional status, such as the strength of muscle strength, durability, quality and range of motion in the joint. Nevertheless, the therapist must possess the knowledge and skills needed to evaluate the physiotherapy process, conducting research in physical therapy, which is based on "evidence based" approach i.e. on evidence-based practice³. Physiotherapists are playing an important role in the development of policies of physiotherapy profession and appropriate standards for the various elements of physical therapy practice in order to ensure the usefulness, accessibility and high quality in the provision of physiotherapy interventions.⁴ The realization of the physiotherapy mission requires that each individual possesses a specific therapist and complex cognitive, psychomotor and emotional behavior when providing care to patient / client and client/patients family.⁴

MORAL AND ETHICAL VALUES IN PROFESSIONAL WORK OF PHYSIOTHERAPISTS

Ethics is the part of philosophy that studies and evaluates the moral value, origin and principles of morality.⁵ Ethics investigates the origins of morality and moral objectives, but also a personal sense of moral volition and moral action. Strictly speaking, ethics is the theory of morality, while the moral validity criteria applicable to actions and practice⁶. The term "moral" has a dimension that makes it kind of practice, our work turns into valuable reality, that it is one fact in the field of social practice. Morality is a social fact⁷. Prerequisites for ethical behavior are: awareness, feelings that contain notions of sympathy and compassion, hope is a fundamental tenet of future morality, and its development and desirable ethical behavior, love - as the term is understood in a very broad sense of emotions and plays a role in the development of morality, but also in personal moral conduct and arises both from the personality, and from the relationship with the others⁷. Ethics is very important for medicine, because as a scientific discipline it concerns about the man, his life, health, and preventing disease. It could be said that modern medical ethics is based on four basic principles: the principle of respect for life, principle of justice - non-discrimination on any basis, the principle of charity - the principle of humanity and the principle of respect for the personality of the patient⁶. Due to the nature of the medical profession, it develops specific relationship between health professionals and patients. In modern society, medical ethics does not require to physiotherapists only knowledge about diseases, prevention, diagnosis and treatment, but also knowledge of the acceptance of the patient as a person equal to themselves⁸. Researches about moral values in the work of physiotherapists in Serbia are very scarce but still it is known that, physiotherapist care and intervention must be two-way; physical and psychological⁹. Physiotherapist, unlike members of other medical professions, are in close contact with patients and therefore it is important to develop communication skills that are required in performing of their professional work¹⁰. Communication skills and ability to understand the patient's problems are prerequisites for the creation of a relationship of trust and where it will be possible to transfer compelling messages about the importance and effectiveness of therapy¹¹. Right at the beginning of the process of physiotherapy treatment, it is important to explain to the patient whether his illness is progressive, chronic and whether it requires continuity in treatment and controlling¹¹. Physiotherapist must be ready to listen to the patient and to understand their needs and problems. The survey conducted among physiotherapists in

Poland, showed that the largest number of respondents said that physiotherapists thanks to a well-established contact with the patients were given better results during the rehabilitation and only 15% of respondents reported that they were not good enough to establish contact with patients and had poorer results.¹⁰ In order to achieve such a harmonized relationship, physical therapists should develop good communication skills that enable them to better understand each patient¹². In accomplishing high-quality interdisciplinary cooperation, health workers should have certain interdisciplinary competences, instruments and methods. In performing their professional tasks in a team, physiotherapists must be familiar with the methodology of work within their profession¹³. Physiotherapists in Serbia, should adhere to a methodology of work that was previously required to standardize and harmonize it with international standards and norms. In rehabilitation medicine teamwork is considered to be a cornerstone and can be described as a collective effort of many individuals who together performed a series of concrete tasks^{14,15}. In interdisciplinary teams in healthcare, with members of other professions, they must cooperate and communicate professionally in order to optimize the patient's condition¹⁶. Research in the field of teamwork in physiotherapy in Serbia is almost non-existent. To achieve such a harmonized relationship, physical therapists should develop good communication skills to ensure a better understanding of each patient¹¹. Some studies have shown that patients with neurological impairments require a greater commitment by their physiotherapist and greater understanding that comes from interpersonal communication¹⁷. The satisfaction of patients is affected by many factors, most of which derive from communication with healthcare professionals. Patient need is to feel the emotional balance in the relationship in order to increase efficiency in conducting the therapy. Most patient's dissatisfactions resulting from lack of communication physiotherapist with them during the treatment, which is then reduced only to the physical component¹⁷. Communication with sick people is based on trust that is built through a quality relationship, active listening, conversation skills and empathy and words that will console patients. Patients are often full of fear and apprehension because it is a period of their life in which there is uncertainty for them. If nothing else, the physiotherapist can, give hope and a word of understanding to the patient¹⁸. Central part of the empathy is active listening. Each patient is an individual for himself and identifying patients' needs, is a challenge for physiotherapists, but not routine. To be more effective in empathy, physical therapists must constantly synchronize with their body language of their patients, and the verbal expressions that are used by their patients. With such beneficial ap-

proach, patients will be more open and engaged in process of their rehabilitation. It has been observed that some patients reduce pain and became more tolerable and have become active participants in the program and thus "easier" patients because of their physiotherapists¹⁹. In physical therapy there is a close physical relationship between the physiotherapist and the patient. This sometimes involves touch in the form of assisted exercises, manipulation and mobilization of the body, and massage. In addition, the therapist meets with the patient during treatment in a dozen or more times, which is much more than the usual patient visits a general practitioner. Since physiotherapists are thereby required to plan, organize, manage and supervise the therapeutic process, a degree of communication between the patient and his physical therapist should be well above average in order to achieve successful rehabilitation. All these activities can affect the emotional involvement of physiotherapists. In order to achieve the relaxed state of their patients, the physical therapists must give a warm friendly approach which among other things contributes to the creation of trust¹⁰. The creation of such a harmonized relationship, can be established by physical therapists by developing good communication skills that is enabling them to better understanding each patient¹¹. Today, the current topics about the crisis of the modern world, the lack of morality in society, which has not bypassed the health profession. Although the scientific debate often talks about the humanization of medicine, it can not be bypassed by very strong breakthrough of technology that is undoubtedly the strong support for the diagnosis of the disease but not the only cause for the lack of empathy with a physiotherapist. One of the important causes are stress and professional burnout of physiotherapist at work that results in a change of behavior towards the patient and the need for routine performance. This raises the issue what the ethical behavior is, because the society and physiotherapy practice is complex and raise many ethical questions¹¹. Today moral crisis of society is inevitably causing erosion of professional morals. The newly established social paradox had an impact on the situation of physiotherapy which is to some extent marginalized profession. It is more than clear that fairness, justice, truth and knowledge neglected moral values, a fair, honest and working person is not an example to be followed²⁰. Important feature that physiotherapist must have is patience, because the results of physical therapy in many patients are seen only after long and hard work with the patient. The physical therapist must be able to provide support and encouragement as well as being actively involved, especially when the patient is losing momentum and wants to give up because it is too heavy or depressed. It is essential for the therapist to be able to maintain good patient's re-

sponse and the need, in order to implement measures aimed at a specific therapeutic aim but also to determine the manner and pace of work. In performing their professional tasks, for a physical therapist, it is not necessary to be physically strong, but is important to have endurance and good condition¹¹. It is therefore necessary as soon as possible, every individual, but also institutionally and socially, to reduce the gap between what is prescribed and what is life. One of the possible ways of solving this moral crisis is the teaching of virtues that should be respected. Physiotherapy profession is as a result of experienced social changes which experienced professional formation and scientific foundation, while human and ethical dimension is almost neglected. It is important to say that listening to the others who requires emotional strength, patience, openness and desire to understand²⁰. Physiotherapists sometimes forget that the question of the balance between science, technology and human warmth, compassionate human relationships, among other things can help in building identity and profession. "Humanity, warmth, compassion on the one hand, and the sciences on the other hand, in the treatment of patients never should come into conflict or compete among themselves"²¹. There is an Australian study, in which was conducted a survey of the physical therapists. On the basis of the work experience, the participants should have to give ratings about the characteristics that make high-quality and complete physical therapist. The results pointed out the importance of placing the patient at the center of their treatment and full attention to their individual needs and the work of the building of mutual trust in relation therapist - patient².

STRESS AND PROFESSIONAL BURNOUT OF PHYSIOTHERAPISTS

Physical therapists often provide their services to patients with various diseases and dysfunctions that have emotional problems. Therefore, physical therapists often suffer from stress and job burnout. In order to avoid these cases, it is necessary to develop strategies that will enable coping with emotional difficulties in different situations. Individuals who believe that the external factors affecting happiness is more likely to develop symptoms of depression, anxiety and emotional exhaustion, and therefore be worse organized in working place²³. The inestimable importance for physiotherapeutic practice is developing practical skills of emphatic behavior and awareness of the present moment. Patients should be more valued as a person, and encouraged in order to provide hope for a speedy recovery and confidence in their specialty. For those physiotherapists who are unable to empathize

with patients are at high risk of job burnout, lack of energy and psychological phenomena problems²⁴. Stress is a component of combustion because the combustion at work is prolonged response to chronic mental and interpersonal stressors on the working place. Stressors in medical practice is classified as a physical, psychological and social stressors. Those who distant themselves from work and do not have a quality level of motivation often experience symptoms of combustion. The symptoms include headache, sleep problems, loss of appetite, psychological problems (depression, anxiety) and the problems of interpersonal communication. One may encounter some behavior problems that result in negligence at work and ruthlessness toward patients²⁵. In contact with the patient the interpersonal and communication skills are of critical importance. Of all health professionals, physical therapists have the highest risk of burnout. Physical therapists often work with the patients who may be in the state of seriously deteriorated health and facing death²⁵. Interaction with the sick requires a multitude of skills and special predisposition. Physiotherapists should focus their communication competence on understanding the patient's condition in order to jointly achieve the goals of therapeutic process²⁵. Job burnout is characterized as physical or emotional exhaustion due to long-term stress and strain. The rush of combustion is described as a special loss of idealism, energy initiatives and future goals because of emotional saturation and exhaustion. Physical therapists can then suffer from mood disorders, sleep and difficulty in mental concentration²⁵. Mental instability is accompanied by physical elements such as headache and indigestion. Physical therapists, who experience burning, feel helpless in their ability to help others, feel fatigue and therefore can not create a quality relationship with their patients. Compared with other medical professionals therapists are most vulnerable to the risk of occurrence of combustion are talking about and many studies conducted in Japan and Italy²⁶.

• According to Maslach and Jackson combustion is categorized as:

• Emotional exhaustion which means a loss of energy due to the accumulation negative feeling related to the job.

• depersonalization that implies detachment from the people who are being treated.

• Lack of personal fulfillment that is described as a feeling of incompetence.

Emotional exhaustion commonly occurs when physi-

cal therapists are dissatisfied with financial compensation for their work, then lack of support from superiors and defective opportunities for professional development. The emergence of depersonalization is associated with dissatisfaction due to low financial compensation, poor cooperation and communication with colleagues. When there is a lack of personal fulfillment, the causes are mostly related also to the bad payment, poor co-operative skills with supervisors and lack of opportunities for professional development. Combustion is the most commonly occurring in physiotherapists who work with children and young patients²⁶. Physiotherapists who work in private practice frequently experience burning at work than those in the public sector. The reason probably lies in the fact that they are more in touch with their patients, unlike those in the public sector who fail to develop closer links with patients, but still the biggest causes of job burnout with a physiotherapist are low income and poor communication with associates and superiors.²⁶ In professional cooperation with colleagues, empathy and will to succeed are essentials that could develop physiotherapy as a profession much faster and more efficiently than ever before. If these aspects are implemented at her through individuals.²⁷ Individual in the profession is the one who is approaching the patient and puts his hands on him, leading him through the therapy and manage his body in the healing process. It is important to connect with the patient in order to meet the complete medical services because therapists are human first, and then professionals.²⁷ Physiotherapy offers great opportunities and that it could deal with competition in the market field, physical therapists need to work on the integration of all aspects that are necessary for that.²⁷ If the treatment does not contain characteristics that are associated with a true desire to get to know the patient and understanding his perspective, there is a chance that treatment will be incomplete. It often happens that physical therapists that are frustrated and the patients that are angry and aggressive which complicates further interaction and possibly lead to refusing of treatment. The patient as a person must be at the center of all the events going on around him and because of him.²⁸ Cole and McLean are standing out the true connection and relationship between the physiotherapist and reasonable patients through cooperation, communication, empathy and respect because in this way develop and relational and interactive component of relationships and an atmosphere in which the treatment is carried out and therefore, treatment is easier for both sides.²⁸ According to the numerous studies, physiotherapists are primary candidates for combustion at work because of close contact with customers in the work of physiotherapy. All studies have shown that pressures related to the lack of time, the saturation of work and conflicts that spawn

from working with "difficult" patients usually caused by combustion. Physiotherapists who experience combustion have usually just started their professional career. In order to diminish the risk of combustion, it is necessary to have the emotional support at work from colleagues and superiors²⁹.

CONCLUSION AND PROPOSED MEASURES

The most difficult and dangerous crisis of a society is precisely a crisis of morality. It devalues the religious, spiritual, human values and generally leaves a moral wasteland. Physiotherapy profession has not escaped from the moral collapse that shattered the fundamental moral values (honesty, truth, justice and the human relationship to man). This is the reason why in modern physiotherapy specialists should have the necessary competences such as knowledge and skills physiotherapy profession, but at the same time should be effective communicators, appraisers of physiotherapy process, educators of younger generations and holders of research processes. It is clear that in a modern and advanced society emerge and new physiotherapy methods and techniques supported by technological and scientific developments and that the classic relationship therapist - patient is seriously changing. Paternalistic model creates a company with a holistic approach. A holistic approach involves teamwork and team work can be described as a collective effort of many individuals who together perform a series of specific tasks. Communication is especially important determinant of teamwork. The tasks that are put for the experts in teamwork in which a patient in the center, beyond the capabilities of the each individual but every member has a specific role to play and must abide by certain norms of professional conduct. This is the point where an important role is played by a good quality of communication that will directly affect the atmosphere in the team, in what way and how much will be cooperation and interaction, the adequate leadership, and therefore the motivation of team members. But how physical therapists can successfully apply a holistic approach in their work within a team, if there is awareness about the fact that the existential and moral crisis affecting all areas of human activity, and that the physiotherapeutic professions lived due to transitional problems which focuses on expertise in the team, while human and ethical dimension almost neglected. Lack of good communication in human relationships is overwhelming productivity at work.

Experts say that one of the preconditions for successfully conducting business is consistent treatment of colleagues. The hallmark of a good team is omnipres-

ent feeling of support, security and confidence, whereby members can rely on each other in difficulties and download creative risks, confident in the support of his associates. The following basic rules of interpersonal relationships in the workplace develop key performance of work team and the development of self-confidence among physiotherapist. To help colleagues preserve its professional reputation is one of the reputed quality of good colleagues in the team. It would certainly be a continuous exercise and development of fundamental moral values such as justice, truth, honesty, wisdom, love, work, patience, modesty, caring, empathy and human warmth creating a positive atmosphere in the team work, a better connection that would have an impact on the success and satisfaction of the individual within the team. Physiotherapists have to cross the boundaries of current practice; in the future they should build their professional and ethical views on case studies encountered in clinical practice. Physical therapists should be able in the future to disclose their ethical problems in medical journals open the problems of physiotherapy, which would compete with the marginal position in the system of evaluation profession.

REFERENCES

1. Hall C. Introduction to therapeutic exercise and the modified disablement model. In: Hall CM, Brody LT, eds. *Therapeutic exercise: moving toward function*. 2nd ed. Philadelphia: Lippincott Williams and Wilkins, 2005: 1-4.
2. Bobinac-Georgievski A. Rehabilitacija u zajednici kao proces integralne skrbi za osobe s fizičkim onesposobljenjem. Sažetak radova. Drugi kongres s međunarodnim sudjelovanjem: Menadžement u zdravstvu. Zagreb, 1997: 91-94. (apstrakt).
3. Porter SB, Tidy NM, eds. *Tidy's physiotherapy*. 15th ed. Edinburgh: Saunders Elsevier, 2013.
4. *Physiotherapist.Ottawa: Foreign Credentials Referral Office*, 2009.
5. Radišić J. *Medicinsko pravo*. Beograd: Pravni fakultet Univerziteta Union, 2008
6. Nenadović M, ur. *Medicinska etika*. Kosovska Mitroviča : Medicinski fakultet, 2007
7. Babić J. *Etika i moral*. Theoria 1 2008; 51: 35-48.
8. Matulić T. *Bioetika*. Zagreb: Glas Koncila, 2001.
9. Spiro H, McCrea Curnen MG, Peschel E, St James D. *Empathy and the practice of medicine : beyond pills and the scalpel*. New Haven: Yale University Press, 1996.
10. Matyja A, Stoj K. Interpersonal communication in medical profession on the example of physiotherapists. *Pol J Public Health* 2015; 124: 125-129.
11. Ofri D. *What doctors feel: how emotions affect the practice of medicine*. Boston: Beacon Press, 2013.
12. Higgs J, ed. *Clinical reasoning in the health professions*. Amsterdam: Elsevier Butterworth-Heinemann, 2012.
13. Vyt A. Interprofessional and transdisciplinary teamwork in health care. *Diabetes Metab Res Rev* 2008; 24: 106-9.
14. Gillespie BM, Chaboyer W, Longbottom P, Wallis M. The impact of organisational and individual Factors on team communication in surgery: a qualitative study. *Int J Nurs Stud* 2010; 47: 732-41.
15. Lerner S, Magrane D, Friedman E. Teaching teamwork in medical education. *Mt Sinai J Med* 2009; 76: 318-29.
16. Hall P, Weaver L. Interdisciplinary education and teamwork: a long and winding road. *Med Educ* 2001; 35: 867-75.
17. Almeida R, Nogueira L, Bourliataux-Lajoine S. Analysis of the user satisfaction level in a public physical therapy service. *Braz J Phys Ther* 2013; 17: 328-35.
18. Garmaz J, Mrdeša-Rogulj Z. Neka načela u komunikaciji s bolesnikom. *Služba Božja* 2013; 3: 319-33.
19. Ringvold ML, Svensen AR. Implementing cognitive behavioural approach in student's clinical practice: third physiotherapy student's experiences. *Eur J Physiother* 2013; 15: 160-5.
20. Covey SR. *The 7 habits of highly effective people. Habit 4, Think win – win*. Provo: Franklin Covey, 2006.
21. Kalauz S. *Sestrinska profesija u svjetlu bioetičkog pluriperspektivizma*. Zagreb: Pergamena, Hrvatska komora medicinskih sestara, 2011.
22. Aguilar A, Stupans I, Scutter S, King S. Exploring the professional values of Australian physiotherapists. *Physiother Res Int* 2013; 18: 27-36.
23. Wilski M, Chmielewski B, Tomczak M. Work locus in control and burnout in Polish physiotherapists: the mediating effect of coping styles. *Int J Occup Med Environ Health* 2015; 28: 875-89.
24. Spandler H, Stickley T. No hope without compassion: the importance of compassion in recovery-focused mental health services. *J Ment Health* 2011; 20: 555-66.
25. Sliwinski Z, Starczynska M, Kotela I, Kowalski T, Kryś-Noszczyk K, Lietz-Kijak D, et al. Life satisfaction and risk of burnout among men and women working as physiotherapists. *Int J Occup Med Environ Health* 2014; 27: 400-12.
26. Pavlakis A, Raftopoulos V, Theodorou M. Burnout syndrome in Cypriot physiotherapists: a national survey. *BMC Health Serv Res* 2010; 10: 63. (doi: 10.1186/1472-6963-10-63).
27. Ohman A, Hagg K, Dahlgren L. Competent women and competing professions – physiotherapy educators' perceptions of the field. *Advances in Physiotherapy* 1999; 1: 59-72. (doi: 10.1080/140381999443447)
28. Kayes NM, McPherson KM. Human technologies in rehabilitation: 'Who' and 'How' we are with our clients. *Disabil Rehabil* 2012; 34: 1907-11.
29. Mandy A, Saeter M, Lucas K. Burnout and self-efficacy in Norwegian physiotherapists. *Int J Ther Rehabil* 2004; 11: 251-7.

Hiperprolaktinemija

Hyperprolactinemia

Aleksandar Aleksić^{1,2}, Vojkan Stanojević², Saška Manić²,
Mile Despotović¹, Nataša Savić¹, Čedomirka Stanojević¹,
Milena Despotović³

1. Visoka medicinska škola strukovnih studija, Čuprija
2. Zdravstveni centar, Zaječar
3. Fakultet medicinskih nauka Univerziteta u Kragujevcu, Kragujevac

Aleksandar Aleksić^{1,2}, Vojkan Stanojević², Saska Manić²,
Mile Despotović¹, Natasa Savic¹, Cedomirka Stanojević¹,
Milena Despotović³

1. Higher Education School of Professional Health Studies, Cuprija, Serbia
2. Health Center, Zajecar, Serbia
3. Faculty of Medical Sciences University of Kragujevac, Kragujevac, Serbia

PRIMLJEN 04.08.2017.
PRIHVACEN 25.11.2017.

RECEIVED 04.08.2017.
ACCEPTED 25.11.2017.

APSTRAKT

Hipersekrecija prolaktina je najčešći uzrok povišenog lučenja hormona hipofize kod oba pola. Tumori hipofize koji luče prolaktin su najčešći tip sekretornih tumora hipofize. Klinička slika hiperprolaktinemije različita je u muškaraca i žena. Kod žena relativno rano dolazi do poremećaja menstrualnog ciklusa i pojave galaktoreje. Kod muškaraca su simptomi duži period vreme diskretni, obično u smislu slabije potencije, te se prilikom postavljanja dijagnoze nalaze u formi makroadenoma (80%). Radiološki „zlatni standard“ za dijagnostiku svih tumora hipofize, pa tako i prolaktinoma, jeste magnetna rezonanca. Oftalmološka obrada važna je posebno kod makroadenoma, jer oni svojim pritiskom na hijazmu optičkog živca mogu dovesti do ispada u vidnom polju. U medikamentnoj terapiji, koriste se agonisti dopamina koji, vezivanjem za dopaminske receptore, dovode do normalizacije nivoa prolaktina, a imaju i tumoricidno delovanje, pa dovode do smanjivanja, a ponekad i nestanka tumora. Neurohirurška terapija, najčešće transsfenoidalnim pristupom, koristi se kod rezistentnih tumora i kod onih koji svojom propagacijom ugrožavaju okolne strukture. Terapija zračenjem gotovo nikada nije prvi vid terapije prolaktinoma. Danas se redje koristi konvencionalno zračenje, a češće stereotaktička „gamma-knife“ iradijacija kojom se postižu visoke doze zračenja ciljano na tumorsko tkivo, uz očuvanje okolnog tkiva.

Ključne reči: hiperprolaktinemija; dijagnoza; lečenje.

ABSTRACT

Prolactin hypersecretion is the most common cause of increased secretion of the pituitary hormone in both sexes. Hypophyseal tumors that secrete prolactin are the most common type of functional pituitary tumor. The clinical picture of hyperprolactinaemia is different in men and women. In women, there is a relatively early onset of menstrual cycle disorders and the occurrence of galactorrhoea. In men, the symptoms are discrete for a long time, usually the lack of potency, and these tumors will be macroadenomas when diagnosing (80%). The diagnosis of hyperprolactinaemia and prolactinoma includes endocrinological testing with radiological and ophthalmic tests. A radiological "gold standard" for the diagnosis of all pituitary tumors, and thus prolactinoma, is a magnetic resonance. Ophthalmological tests are important especially for macroadenomas because they can lead to a fall in the visual field by pressing the optic nerve chiasma. In drug therapy, dopamine agonists are used which, by binding to dopamine receptors, lead to normalization of the level of prolactin, and they also have tumorcidal activity and lead to a reduction of and sometimes, tumor failure. Neurosurgical therapy, most often with transsphenoidal approach, is used in resistant tumors and in those who endanger the surrounding structures with their propagation. Radiation therapy is rarely first line of prolactin therapy. Today, conventional radiation is used more often, and as stereotactic "gamma-knife", irradiation that achieves high radiation doses targeted to the tumor tissue, while preserving the surrounding tissue.

Key words: hyperprolactinemia; diagnosis; therapeutics.

KORESPONDENCIJA / CORRESPONDENCE

Aleksandar Aleksić, ZC Zaječar Interno odeljenje, Rasadnica b.b., 19000 Zaječar, E-mail: lukaal@ptt.rs
Aleksandar Aleksić, Health Center, Zajecar, Rasadnica b.b., 19000 Zaječar, Serbia, E-mail: lukaal@ptt.rs

UVOD

Prolaktin (PRL) je peptidni hormon, prednjeg reznja hipofize, izolovan 1971. godine. Laktotropne ćelije čine 20% ćelija prednjeg reznja hipofize. Laktotropi i somatotropi potiču od zajedničke prekursorne ćelije. Prolaktin (PRL) se sastoji od 198 aminokiselina i ima molekulsku masu od 21,500kDa, delimično je homolog (40%) sa hormonom rasta i humanim placentalnim laktogenom^{1,2,3}.

Prolaktin (PRL) može biti i ekstrapituitarnog porekla. Izvan hipofize PRL se sintetise u miometriju uterusa, timusu, slezini, centralnom nervnom sistemu (CNS), u epitelu mlečnih žlezda, limfocitima, fibroblastima kože. Deluje endokrino, ali i kao faktor rasta, neurotransmiter, neuromodulator, imunomodulator na parakrini i autokrinim dejstvom^{1,4}.

Prolaktin koji određujemo u krvi jeste hipofizni, suprimovan prolaktin, pošto nema preliivanja prolaktina koji je nastao ekstrapituitarno^{1,4}.

PRL je jedinstven među hipofiznim hormonima po tome što je njegova centralna kontrola dominantno inhibitorna, odnosno postoji stalna dopaminska supresija oslobađanja PRL.

Dejstvo dopamina se ostvaruje preko više subtipova dopaminskih receptora, s tim što je u hipofizi dominantan tip 2 dopaminskih receptora (D2). Aktivacija D2 receptora inhibira ciklični adenozin monofosfat (cAMP) put i izaziva membransku hiperpolarizaciju i zatvaranje kalcijumskih kanala što blokira egzocitozu sekretornih granula^{1,2,5,6,7}.

Sam prolaktin negativnom povratnom spregom deluje na hipotalamus, tako što pojačava lučenje dopamina i deluje direktno inhibitorno i na laktotropne ćelije.

Sekrecija prolaktina je pulzatilna, sa najvećim sekretornim pikovima pri fazi brzih pokretima očnih jabučica tokom spavanja. Maksimalni serumski nivo nastaje tokom jutarnjih časova, dok tokom dana opada tako da je minimalni nivo oko 20h. Pulsevi sekrecije se smenjuju na 20-30 minuta, dok je poluživot prolaktina oko 20-40 minuta^{1,2,3,6,7}.

Nivo PRL se povećava tokom i nakon fizičkog opterećenja i vežbi, posle obroka, posebni posle obroka koji je bogat proteinima, nakon seksualnog odnosa, tokom i nakon hirurških procedura, nakon opšte anestezije, infarkta miokarda i raznih drugih oblika stresa³.

U trudnoći vrednosti prolaktina rastu i do 10 puta, dok do pada vrednosti prolaktina dolazi nakon dve nedelje posle porodjaja uz potpuni povratak preporodjajnim vrednostima nakon šest nedelja. U slučaju dojenja, nivo PRL ostaje povišen³.

Estrogen i progesteron inhibišu laktaciju i sa PRL vrše kontrolu laktacije. Po porođaju nivoi estrogena i progesterona padaju tako da dolazi do laktacije. Neuralnim putem, sisanje bradavice podiže nivo PRL. Tireotropin-oslobađajući hormon (TRH) i vazoaktivni inhibitorni peptid (VIP) indukuju oslobađanje PRL, dok glikokortikoidi (GK) i tireoidni hormoni (TH) suprimiraju sekreciju^{3,4}.

Glavni oblik prolaktina koji se nalazi u krvi jeste mali prolaktin, PRL u obliku monomera i čini 80-90% od ukupne količine prolaktina.

Veliki prolaktin (big prolactin) predstavlja glikolizirani oblik prolaktina u vidu dimera i trimera i predstavlja depo prolaktina. Ovakav oblik nema biološku aktivnost ili je ona zanemarljiva.

Makroprolaktin (big big prolactin) predstavlja dimer velikog prolaktina sa IgG imunoglobulinom. Ovakav oblik prolaktina takođe nema biološku aktivnost^{1,4}.

Prolaktin ima preko 300 bioloških funkcija i svoje efekte ostvaruje preko prolaktinskih receptora koji spadaju u grupu citokinskih receptora tip 1. Svoje efekte u ćeliji ostvaruje putem janus-kinase (JAK) koja fosforiliše komponente elemente transdukcije signala i aktivatora transkripcije (STAT). STAT proteini se prenose u jedro gde deluju kao faktori transkripcije¹.

Prolaktin ima značajnu ulogu u održavanju reproduktivne funkcije. Potpuni nedostatak prolaktina i/ili PRL receptora dovodi do steriliteta i onemogućava razvoj mlečnih žlezdi. Takođe kod nekih eksperimentalnih životinja je utvrđeno odsustvo materinskog ponašanja. Hiperprolaktinemija dovodi do hipogonadizma dvostrukim efektom, perifernim efektom sprečava delovanje FSH i LH na nivou gonada, u ovarijumima blokira folikulogenezu i inhibira aromatozu što dovodi do smanjenja nivoa estrogena i izostanka ovulacije, a centralnim efektom preko povećanog dopaminskog tonusa dovodi do gubitka pulsatilne sekrecije gonadotropin-oslobađajući hormon (GnRH), što dovodi do posledičnog smanjenja FSH i LH¹.

Prolaktin može da deluje i na osmoregulaciju dovodeći do zadržavanja Na i K. Deluje preko svojih receptora u nadbubregu i može delom uticati na funkciju nadbubrega i elektrolite u serumu. PRL utiče na metabolizam kalcijuma tako što povećava apsorpciju kalcijuma iz creva¹.

Takođe u jetri može da dovede do sinteze manjih količina insulinu sličnog faktora rasta 1 (IGF1), tako da prolaktin ima mitogeno i proliferativno dejstvo na hepatocite.

Prolaktin učestvuje u kontroli spavanja, apetita, u sintezi neurotransmitera, učestvuje u seksualnom ponašanju modulacijom aktivnosti GnRH, učestvuje u kontroli materinskog ponašanja nakon porođaja¹.

Utiče na metabolizam ugljenih hidrata, tako što povećava nivo glikemije, povećava sekreciju insulina, dovodi do rasta beta ćelija pankreasa, ali ima dijabetogeno dejstvo.

Prolaktin ima snažno imunostimulatorno dejstvo, tako što na limfocite deluje anti-apoptotično ali i stimulatorno tako što stimuliše i celularni i humoralni imunitet^{8,9}.

EPIDEMIOLOGIJA

Povišeni nivoi PRL mogu se naći kod oko 10% opšte populacije. Hipersekrecija prolaktina je najčešći uzrok povišenog lučenja hormona hipofize kod oba pola. Postojanje hiperprolaktinemije javlja se kod oko 15–20% žena sa poremećajem menstrualnog krvarenja i kod 43–87% žena sa odsustvom menstruacije i pojavom galaktoreje i kod 30–40% infertilnih žena, tako da je učestalost hiperprolaktinemije kod žena 90/100.000 žena, dok kod muškaraca iznosi 20/100.000 muškaraca³.

ETIOLOGIJA

Hiperprolaktinemija se deli na fiziološku, medikamentnu i patološku hiperprolaktinemiju^{3,4}.

Bilo koji faktor koji deluje na sintezu i transport prolaktin inhibitornog PIF, uključujući i delovanje na receptore prolaktin inhibitornog faktora može dovesti do porasta nivoa PRL. Takođe do hiperprolaktinemije može dovesti i pojačana produkcija i usporena razgradnja prolaktina⁴.

Fiziološka hipersekrecija prolaktina sreće se kod trudnoće, laktacije, povrede grudnog koša, stimulacije dojki i bradavica, nakon seksualnog odnosa, tokom orgazma kod muškaraca nivo dopamina pada, tako da se javlja skok PRL, što kod muškaraca dovodi do naglo nastale pospanosti. Takođe, do skoka prolaktina dolazi nakon stresa bilo psihičkog ili fizičkog.

Lekove koji povećavaju nivo PRL možemo podeliti na lekove koji deluju na hipotalamus i blokiraju dejstvo, produkciju i sekreciju dopamina, i na lekove koji deluju direktno na hipofizu, stimulišući laktotropne ćelije, ili blokiraju D2 receptore⁴.

Antipsihotici, estrogeni, metildopa, metoklopramid, donperidon, antidepresivi, metoklopramid, rezerpin, verapamil i opijati su lekovi koji mogu da dovedu do porasta prolaktina⁴.

Patološki uzroci hiperprolaktinemije podrazumevaju oštećenje hipotalamo-hipofizne peteljke, tumore (kraniofaringeomi, meningeomi, disgerminomi, metastaze), prazno tursko sedlo (empty sella), limfocitni hipofizitis, granulomi, cista Rathkeovog špaga, radijacija, trauma, presek hipofizne peteljke (hirurgija supraselarne regije).

Hiperplazija laktotropnih ćelija, obično nastaje kao posledica smanjenja dopaminskog inhibitornog uticaja, lezija hipotalamusa ili lezija hipotalamo-hipofizne peteljke, najčešće daje laku do umerenu hiperprolaktinemiju (prolaktin do 150ng/ml)⁴.

Sistemske bolesti i stanja

Smanjenje klirensa prolaktina kod hronične bubrežne insuficijencije, PCOSy, estrogeni povišavaju nivo PRL, tako da 30% pacijentkinja sa PCOSy ima hiperprolaktinemiju, hipotiroidizam, insuficijencija jetre, epileptični napadi⁴.

Adenomi laktotropnih ćelija (prolaktinomi)

Ovi tumori čine polovinu svih sekretornih tumora hipofize. Čine 30-50% svih tumora hipofize. Godišnja incidenca iznosi 3/100.000 stanovnika. Postoje i plurihormonalni tumori, odnosno mešovite forme tumora koji sekretuju hormon rasta i prolaktin, kao i mešovite forme koje sekretuju ACTH, PRL, TSH i PRL¹.

Prolaktinomi su najčešće intraselarni i preko 90% prolaktinoma je manje od 10mm, predstavljaju najčešće sekretorne pituitarne tumore. Više od 90% mikroadenoma ne raste i ne progredira pod terapijom. Kod muškaraca se u 60% slučajeva nalaze makroadenomi. Verovatan uzrok je taj što mikroadenomi dosta dugo ostaju asimptomatski i kasno se otkrivaju. Nivo prolaktina je direktno proporcionalan veličini tumora³. Za tumore manje od 10mm uobičajen je nivo prolaktina manji od 200ng/ml, za tumore od 1-2cm uobičajen nivo prolaktina je od 200-1000 ng/ml. Tumori veći od 2cm daju nivo prolaktina veći od 1.000ng/ml. Veliki tumori sa niskim prolaktinom, obično su loše diferentovani i obično loše reaguju na terapiju. Kod velikih tumora sa niskim prolaktinom treba voditi računa o hook efektu - zasićenje esejja prolaktinom, tako da se mogu dobiti lažno niske vrednosti prolaktina. Interferencija u enzimoimunoeseju prevazilazi se dilucijom 1:100, nakon čega se dobijaju realne vrednosti nivoa prolaktina^{3,4,11}.

Na makroprolaktinemiju treba posumnjati kod asimptomatskih pacijenata sa visokim nivoom prolaktina, odsustvo odgovora na terapiju⁴.

KLINIČKA SLIKA

Kliničke manifestacije hiperprolaktinemije, mogu da budu posledica lokalne ekspanzije i kompresije makroprolaktinoma na okolne strukture, odnosno mogu da budu posledica hipersekrecije prolaktina i posledica ispada sekrecije pojedinih ili svih hormona hipofize, zbog kompresivnog efekta^{3,4}.

Kod žena se ispoljava oligoamenorejom, amenorejom, galaktorejom i infertilitetom. Vaginalna suvoća, dispareunija, gubitak libida, smanjenje koštane gustine, uglavnom su tipični pokazatelji hiperprolaktinemije. Galaktoreju postoji kod oko 30-90% žena. Najčešće je obostrana i spontana, ali se može javiti i kao unilateralna i provocirana. Pacijentkinje takođe mogu da imaju porast u telesnoj masi i umereni hirzutizam. Ako je uzrok hiperprolaktinemije tumor koji se širi van turskog sedla, mogu nastati poremećaji vida, glavobolje. Hiperprolaktinemija pre puberteta dovodi do primarne amenoreje.

Kod muškaraca hiperprolaktinemija dosta dugo ostaje asimptomatska, najpre se javlja smanjenje libida (na šta se muškarci uglavnom ne žale), kasnije se javljaju glavobolje i smetnje sa vidom kada se otkrivaju prolaktinomi, i to makroprolaktinomi.

Kao posledica smanjene produkcije testosterona javlja se impotencija i oligospermija. Galaktoreja kod muškaraca uglavnom je retka. Dugotrajna hiperprolaktinemija dovodi do razvoja efekata hipogonadizma, tako da imamo redukciju mišićne mase, smanjen rast brade, smanjenje koštane gustine³.

DIJAGNOZA I DIFERENCIJALNA DIJAGNOZA

Kada se javia mlada žena sa amenorejom i visokim prolaktinom, najpre je potrebno isključiti trudnoću. Kompletna dijagnoza postavlja se merenjem nivoa uTSH, testiranjem bubrežne i hepatične funkcije, merenjem serumskog nivoa PRL uz sprovođenje radiološke dijagnostike sa MR^{3,4,11,12}.

Pacijent pre uzimanja krvi za određivanje prolaktina ne bi trebalo da ima teže fizičke aktivnosti, trebalo bi ukinuti ishranu bogatu mastima i proteinima 24h pre uzimanja krvi, pre davanja krvi izbeći stimulaciju dojki, poželjno je 8-10h gladovanja pre davanja krvi, takođe je potrebno da pacijent bude budan najmanje dva sata pre davanja krvi, krv treba uzorkovati 60 minuta po postavljanju brunile¹³.

Međutim, ima autora koji ostaju pri stanovištu da nivo PRL treba određivati u 2-3 uzorka tokom dana, s tim što jutarnji uzorak krvi ne treba uzimati pre 9h.⁴

Najveći broj grešaka prilikom određivanja PRL dešava se u preanalitičkoj fazi.

Konverzija milijedinica po litru u nanograme po mililitru i obratno, vrši se na sledeći način: $\text{mIU/l} \times 0,0472 = \text{ng/ml}$, odnosno $\text{ng/ml} \times 21,2 = \text{mIU/l}$.

Za vrednosti PRL od 20-40ng/ml, (500-900 mIU/l) savetuje se ponavljanje merenja.

Vrednosti PRL od 40-200 ng/ml, (500-4000 mIU/l) sreću se kod jatrogene hiperprolaktinemije i/ili kod ekstrapituitarne hiperprolaktinemije ili kod idiopatske hiperprolaktinemije.

Vrednosti PRL od 100-200ng/ml (2000-4000 mIU/l) sreću se uglavnom kod prolaktinoma.

Vrednosti PRL veće od 200ng/ml uglavnom se viđaju kod makroprolaktinoma.

Kod kompresije na hipofiznu peteljku (pseudoprolaktinom) vrednosti PRL obično bivaju niže od 200ng/ml, (500-4000 mIU/l).

U slučaju postojanja makroadenoma sa srednje povišenim vrednostima PRL, potrebno je uraditi razblaženje seruma i određivanje PRL. Ako vrednosti ostanu iste (srednje povišene vrednosti PRL u prisustvu makroadenoma), nije sigurno da li se radi o hiperprolaktinemiji koja je posledica preseka hipotalamo-hipofiznog stalka ili slabo sekretornom adenomu, a u cilju potvrde dijagnoze preseka stalka potrebno je propisati terapiju dopaminskim agonistom. Kod preseka stalka izostaje odgovor na terapiju¹¹.

Vrednosti PRL od 20-200ng/ml u prisutvu makrolezije, zahtevaju retestiranje uzoraka razblaženjem 1:100, kako bi se izbeglo zasićenje eseja i dobijanje lažno niskih vrednosti.

Kod asimptomatskih pacijenata sa visokim nivoom PRL savetuje se određivanje makroprolaktina. Neki autori savetuju skrining na makroprolaktin kod svih pacijenata. Precipitacija makroprolaktina se vrši perkutnom endoskopskom gastrostomom (PEG-om). PEG precipitira makroprolaktin, tako da se izdvaja samo monomerni oblik prolaktina⁴.

Kada nije otkriven razlog hiperprolaktinemije, uključujući i vizuelizacionu dijagnostiku, postavlja se dijagnoza idiopatske hiperprolaktinemije.

Kod asimptomatskih pacijenata koji su na terapiji lekovima koji mogu uticati na nivo prolaktina, ne savetuje se određivanje prolaktina što važi i za vizuelizacionu dijagnostiku. Vizuelizaciona dijagnostika savetuje se kod šestostrukog povećanja vrednosti prolaktina.

Retestiranje prolaktina se vrši tek nakon 2-5 dana po ukidanju leka koji može da utiče na nivo prolaktina⁴. Vrednosti PRL mogu da se normalizuju nakon nekoliko dana do nekoliko nedelja po ukidanju psihotropnog leka koji može dovesti do hiperprolaktinemije¹¹. Ne savetuje se istovremena primena agonista dopamina sa psihotropnim lekovima⁴.

U slučaju da psihotropni lekovi ne mogu biti ukinuti, savetuje se NMR kako bi se isključilo postojanje prolaktinoma i potvrdila medikamentima indukovana hiperprolaktinemija¹³.

Dinamski testovi su uglavnom napušteni i ne savetuje se njihovo izvođenje⁴.

Što se tiče radiološke dijagnostike, savetuje se radiološka dijagnostika za bilo koji nivo hiperprolaktinemije, metoda izbora jeste NMR sa primenom gadolinijumskog kontrasta, jer omogućava uvid u odnose sa optičkom hijazmom i kavernoznim sinusima. Ako je nalaz NMR-a normalan, govorimo o idiopatskoj hiperprolaktinemiji. CT sa intravenskim kontrastom se može koristiti u slučaju da nam je NMR nedostupan ili da postoje kontraindikacije za korišćenjem istog.

Rentgensko i izotopsko snimanje se ne preporučuju^{4,13}.

TERAPIJA

Prva linija lečenja jeste medikamentno lečenje. U terapiji se koriste agonisti dopamina: bromocriptin, quinagolide, cabergolin¹².

Od početka oralne terapije, u prvih nekoliko sati dolazi do smanjenja nivoa PRL, nakon nekoliko meseci dolazi do normalizacije nivoa PRL. Samo unutar nekoliko dana može doći do smanjenja volumena tumora, može doći do oporavka vida i smanjenja kompresivnih smetnji, kao i do oporavka funkcije hipofize koja je bila posledica kompresivnih efekata, 90% makroadenoma ima pozitivan odgovor na terapiju. Nakon 6-12 meseci terapije, većina tumora smanjuje volumen za više od polovine početnog volumena^{3,4,12}.

Ako se radi o idiopatskoj hiperprolaktinemiji, ne preporučuje se terapija hiperprolaktinemije, ista se leči samo u slučaju postojanja kliničkih manifestacija, oligoamenoreje, steriliteta, galaktoreje¹³.

Ne preporučuje se terapija u asimptomatskih pacijenata i medikamentima izazvanoj hiperprolaktinemiji¹³.

Kod simptomatskih pacijenata, prvi korak u ovom slučaju bi trebalo da bude ukidanje leka koji je doveo do hiperprolaktinemije. Ako to nije moguće, savetuje se zamena drugim lekom koji ima slabije hiperprolaktinemi-

jsko dejstvo. Ako ni ova opcija nije moguća, savetuje se, uz konsultaciju sa psihijatrom i primena dopaminskog agoniste, kao najnepoželjnije rešenje. Kod pacijenata sa hipogonadizmom i gubitkom koštane mase, savetuje se primena testosterona odnosno estrogena¹³.

Neki autori smatraju da kod asimptomatskih pacijenata sa mikroadenomima, ne bi trebalo dati terapiju, što se u ovom slučaju savetuje intenzivno praćenje pacijenta¹³.

Bromokriptin tablete od 2,5mg se uzimaju tako što se počinje sa pola tablete uveče, a zatim se lagano povećava doza do 15mg/24h podeljeno u 3 doze, (maksimalna dnevna doza 30mg). Doza se povećava na 2-4 dana. Quinagolide se (25,50,75mg), koristi jednom dnevno i to tako što se počinje se sa dozom od 25mg tri dana, potom 50mg tri dana i dalje doza od 75mg. Cabergolin (0,25mg) daje se dva puta nedeljno u dozi od 0,25mg. Doza se povećava na 4 nedelje do doze od 1mg dva puta nedeljno.

Nakon započinjanja terapije, savetuje se merenje PRL jednom mesечно u prva tri meseca, nakon toga na tri meseca, zatim na šest meseci.

NMR se savetuje nakon godinu dana, u slučaju postojanja makroadenoma sa kompresijom na optičku hijazmu savetuje se NMR na tri meseca. Takođe se savetuje oftalmološko ispitivanje uključujući i širinu vidnog polja. Kod pacijenata sa hiperprolaktinemijom se preporučuje i određivanje koštane gustine¹².

Postoje preporuke da se minimalna doza održavanja dopaminskog agoniste smanji i postepeno ukine nakon 3-4 godine terapije, i to u slučaju stabilnog i normalnog nivoa PRL na minimalnim dozama održavanja, odnosno u slučaju da se tumor ne vizuelizuje na NMR-u, odnosno da mu je zapremina za minimalno 50% manja od početne¹².

Po ukidanju terapije, vrednost PRL treba određivati u prva tri meseca jednom mesečno, a zatim na tri pa na svakih šest meseci. U slučaju skoka vrednosti PRL potrebno je odraditi NMR¹².

Kod simptomatskih pacijenata kojih se ne normalizuje nivo PRL pod terapijom i kod kojih ne dolazi do redukcije tumorske mase na standardnim dozama dopaminskih agonista, savetuje se primena maksimalne tolerabilne doze dopaminskog agoniste, odnosno zamena bromokriptina kabergolinom. U ovom slučaju se savetuje ehokardiografska kontrola eventualnih valvularnih poremećaja¹³.

Rezistencija prolaktinoma na terapiju dopaminskim agonistima uglavnom je parcijalna i smatra se da je posledica nedovoljnog broja D2 receptora na tumorskim ćelijama, ili je posledica defekta u postreceptorskom

signalnom putu¹³. Dopaminski agonisti deluju na prolaktinome preko D2 receptora. Transdukcija signala ostvaruje inhibiciju transkripcije prolaktina preko guanin nukleotid vezujućih proteini (G proteina), fosfokinaze C, kalcijumskih kanala i transkripcionog faktora Pit1. Istovremeno preko D2 receptora odvija se i proces inhibicije proliferacije laktotropnih ćelija. Oko 20- 30% bolesnika ima delimičnu rezistenciju na dopaminsku terapiju. Ovi prolaktinomi imaju normalne D2 receptore. Ukoliko postoji rezistencija, moguć je poremećaj na nivou smanjene ekspresije Gi ili Pit gena. Ovi tumori ekspimiraju i ektopične somatostatinske receptore tip 5 (SSTR5), a ne moraju ekspimirati eutopične receptore¹.

Ako se tokom medikamentne terapije javi intolerancija, rezistencija, ozbiljna neželjena dejstva lekova, kao i lokalna invazija i kompresija tumora na lokalne strukture, naročito optičku hijazmu, onda se pristupa neurohiruškom lečenju. Neurohirurška intervencija najčešće podrazumeva transsfenoidalni pristup hipofizi.

Zračna terapija rezervisana je za rezistentne pacijente ili pacijente sa kontraindikacijama za hirušku terapiju. Sem konvencionalnog zračenja mogu se primenjivati i fokusirani gama zruci - gama nož (gamma knife). Radioterapija je rezervisana za rezistentne maligne prolaktinome¹³.

Žene koje su na terapiji bromokriptinom treba da saznaju da li su gravidne. Za vreme trudnoće ne treba određivati koncentraciju PRL. Ako tokom trudnoće dođe do simptomatskog rasta tumora savetuje se nastavak terapije bromokriptinom^{3,13}.

Kod pacijentkinja sa makroprolaktinomima koji ne pokazuje adekvatno smanjenje mase tumora na terapiji, i gde pacijentkinje slabije tolerišu terapiju, pre trudnoće se savetuje hiruško lečenje prolaktinoma¹³.

ZAKLJUČAK

Hiperprolaktinemija je čest uzrok amenoreje, galaktoreje, infertiliteta, erektilne disfunkcije i o njoj treba misliti u predhodno navedenim poremećajima. Kod hiperprolaktinemija u mladih žena u reproduktivnom periodu, najpre treba isključiti trudnoću. Hiperprolaktinemija se može javiti i kod psihijatarskih pacijenata koji koriste lekove koji mogu podići nivo prolaktina, ali se rutinsko određivanje nivoa proteina ne preporučuje kod pacijenata koji ne pokazuju nikakve simptome i znake hiperprolaktinemije. Prva linija lečenja hiperprolaktinemije je farmakološka terapija dopaminskim agonistima, tako da prolaktinome, odnosno tumore hipofize prvenstveno leči endokrinolog, a ukoliko se lečenje pokaže neuspešnim, onda se pristupa neurohiruškom lečenju.

LITERATURA

1. Popović V. Prolaktin i prolaktinomi. Kompendijum iz endokrinologije. Beograd: Medicinski fakultet, 2003.
2. Popović V. Bolesti hipofize. U: Manojlović M, ur. Interna medicina. Beograd: Zavod za udžbenike i nastavna sredstva, 2003: 1157-63.
3. Mladenović V, Petrović J, Bubanja D, et al. Hiperprolaktinemija: dijagnoza i principi lečenja. Med Čas 2013; 47: 130-6.
4. Lopez MÁC, Rodriguez JLR, Garcia MR. Physiological and pathological hyperprolactinemia: can we minimize errors in the clinical practice? In: Nagy GM, Toth BE, eds. Prolactin. Rijeka, InTech, 2013: 213-30.
5. Bole-Feysot C, Goffin V, Edery M, Binart N, Kelly PA. Prolactin and its receptor: actions, signal transduction pathways and phenotypes observed in PRL receptor knockout mice. Endocr Rev 1998; 19: 225-68.
6. Ben-Jonathan N, Mershon JL, Allen DL, Steinmetz RW. Extrapituitary prolactin: distribution, regulation, functions and clinical aspects. Endocr Rev 1996; 17: 639-69.
7. Heaney A, Melmed S. Pituitary tumour transforming gene: a novel factor in pituitary tumour formation in pituitary tumours. J Clin Endocrinol Metab 1999; 13: 367-80.
8. Orbach H, Zandman-Goddard G, Boaz M, et al. Prolactin and autoimmunity: hyperprolactinemia correlates with serositis and anemia in SLE patients. Clin Rev Allergy Immunol 2012; 42: 189-98.
9. Legorreta-Haquet M.V, Flores-Fernández R, Blanco-Favela F, et al. Prolactin levels correlate with abnormal B cell maturation in MRL and MRL/lpr mouse models of Systemic Lupus Erythematosus-Like disease. Clin Develop Immunol 2013; 2013: 287469. doi: 10.1155/2013/287469.
10. Dekkers OM, Lagro J, Burman P, Jørgensen JO, Romijn JA, Pereira AM. Recurrence of hyperprolactinemia after withdrawal of dopamine agonists: systematic review and meta-analysis. J Clin Endocrinol Metab 2010; 95: 43-51.
11. Wong A, Eloy JA, Couldwell WT, Liu JK. Update on prolactinomas. Part 1: Clinical manifestations and diagnostic challenges. J Clin Neurosci 2015; 22: 1562-7.
12. Wong A, Eloy JA, Couldwell WT, Liu JK. Update on prolactinomas. Part 2: Treatment and management strategies. J Clin Neurosci 2015; 22: 1568-74.
13. Melmed S, Casanueva FF, Hoffman AR, et al. Diagnosis and treatment of hyperprolactinemia: an Endocrine Society clinical practice guideline. J Clin Endocrinol Metab 2011; 96: 273-88.

The benefits of the C1 and C2 vertebrae derotation in a patient with chronic cervical myofascial pain.

Предности деротације Ц1 и Ц2 код пацијента са хроничним миофасцијалним боловима у врату

Pop Marius Sorin, Debucean Daiana, Lalu Manuela

Linea Medica Clinic, Oradea, Romania

Pop Marius Sorin, Debucean Daiana, Lalu Manuela

Linea Medica Clinic, Велики Варадин, Румунија

PRIMLJEN 06.09.2017.

PRIHVAĆEN 28.11.2017.

RECEIVED 06.09.2017.

ACCEPTED 28.11.2017.

ABSTRACT

Objective. The aim of this study was to present the case of a patient with chronic cervical pain and an elevated postural imbalance in the frontal plane.

Method. The present case report was carried out in June 2017. The subjective assessment of the pain, the global postural assessment, the computerized baropodometry, the assessment of the walking and the biomechanics of the foot and functional tests (Fukuda, Romberg, VAD 2.7, Vasyli Medical and Sahrman), were used to assess the postural imbalance.

Results. The objective results were the immediate alignment of the cranium and underjaw to the central line of the body, a partial cancellation of the compensatory pathological curves from the area of the dorsal lumbar spine and the amplification of the laterality movement. The subjective result, as reported by the patient, was the absence of the previously felt discomfort at the active cranio-cervical mobility test, in the left laterality movement.

Conclusion. The manual derotation of the C1 and C2 vertebrae resulted in efficient and long-term postural rehabilitation by canceling the fascial constraints and asymmetries at the base of the skull that maintained the postural syndrome, responsible in time for the onset of the symptomatology.

Key words: neck pain; movement disorders; joint diseases.

АПСТРАКТ

Циљ. Циљ ове студије је био да се прикаже случај пацијента са хроничним боловима у врату и повећаним постуралним дисбалансом у фронталној равни.

Метод. Овај случај се десио у јуну 2017. године. За процену постуралне неравнотеже коришћени су: субјективна процена бола, глобална постурална процена, компјутеризована бароподометрија, процена ходања и биомеханика ногу и функционални тестови (Fukuda, Romberg, VAD 2.7, Vasyli Medical and Sahrman).

Резултати. Објективни резултати били су непосредно поравнање лобањског и доњег дела на централној линији тела, делимично ублажавање компензаторних патолошких кривина из подручја дорзалне лумбалне кичме и амплификација латералне покретљивости. Субјективни резултат, како је извештавао пацијент, био је одсуство ранијег осећаја неугодности на тесту активности кранио-цервикалног покрета, у покрету ка левој страни.

Закључак. Мануално деротирање C1 и C2 пршљена довело је до ефикасне и дугорочне постуралне рехабилитације поништењем фасцијалних ограничења и асиметрије на бази лобање која су одржавала постурални синдром, а која су својевремено била и одговорна за настанак симптоматологије.

Кључне речи: бол у врату; поремећаји покрета; болести зглобова.

KORESPONDENCIJA / CORRESPONDENCE

Pop Marius Sorin, Linea Medica Clinic, Румунија, E-mail: marivs_pop@yahoo.it

Pop Marius Sorin, Linea Medica Clinic, Oradea, Romania, E-mail: marivs_pop@yahoo.it

INTRODUCTION

The chronic cervical pain (CCP) is an extremely frequent symptom in the general population, a fact that might soon transform it into a public health problem. Due to its high incidence and the expansion of the age of the affected population – if in the past it was a symptom associated especially with old people, nowadays it is spread among young people and even children –, the CCP becomes a topical subject in the scientific researches in different fields.¹ All these have as goal the development of some effective preventive and therapy methods, based especially on the accurate identification of the causes and an exact understanding of the implied pathological mechanisms.

The remission of the symptoms, the elimination of the causes, but also the blocking of the reoccurrence would have a major positive impact upon the state of health of the affected population, the improvement of the quality of the personal and professional life, but also upon the budget of the sanitary system.²⁻⁶

For an accurate diagnostic and classification of the CCP, the clinical practice uses concepts of the multifactorial theory. The mechanic origin is the most incriminated one, amplified in many cases by a psychological component.

The present study explores the mechanisms involved in the chronic pain, which induce and maintain, in fact, the initial biomechanical imbalance, as well as the elements that worsen the CCP or that generate contexts that may delude the diagnostician.

PATIENT AND METHOD

The 32 years-old female patient came with the following complaints: cervical pains (especially when sitting) that irradiates ascendant (cervicogenic headache) and postural imbalance, mainly in frontal plane, noticed by the patient. She has also an orthodontic diagnosis of malocclusion and an important gingival retraction, attributed to an alteration of the mandibular dynamics.

The clinical symptoms were: a restriction of the upper cervical rachis with an important limitation of the left inclination of the cranium, that indicates an ample rotation of the C2 vertebra to the right;⁷ a limitation of the left rotation of the cranium, which demonstrates a rotation of the C1 vertebra, also to the right; sounds and pain at the temporomandibular joint (TMJ); reported bruxism; trigger points in the suboccipital area, with high sensitivity on the right; fascial restriction areas on the whole head surface; tension of the bilateral masseter muscles

(there can be appreciated a slight hypertrophy of these structures); an important deviation, towards right, of the center line of the cranium compared to the center line of the body, that persists in all the examined positions and gestures (orthostatism, sitting in decubitus, bending gesture, imitation of some daily gestures); an inclination of the bipupilar line and of the occlusal plane towards right, even after the correction of the position of the head; the adaptation (with structuring phenomena) of the dorsal and lumbar spine to the above-mentioned proximal imbalance.

All the receptors of the postural system implied in the installation of the postural imbalance painfully manifested (foot, vestibule, eye, scapular and pelvic girdle) were assessed with scientifically validated tests: Fukuda, Romberg, VAD 2.7 – Visual Acuity Difference, Vasyli Medical, Sahrman. We draw the conclusion that there is no disorder of the previously named receptors, the assumption of the implication of the C1, C2 rotation in the postural syndrome already categorized remaining valid.

Based on the clinical symptoms (pain, imbalance), the objective findings of the assessment and the results of the tests used, the diagnosis is a malposition with primary biomechanical dysfunction of the C2 vertebra.

The manual derotation technique of the C1 and C2 vertebrae was applied. The patient was then invited to perform habitual moves and postures (walking, sitting, picking up an object) to make sure that the subsequent measurements would not be altered by the conscious maintenance of the new position obtained after the derotation. 15 minutes after, a new set of pictures was made, from the same planes.



Figure 1. Initial posture, before performing the derotation maneuver of C1, C2 vertebrae.



Figure 2. Initial posture, before performing the derotation maneuver of C1, C2 vertebrae (imbalance of the center line of the cranium).

The objective results were the immediate alignment of the cranium and underjaw to the central line of the body, a partial cancellation of the compensatory pathological curves from the area of the dorsal lumbar spine and the amplification of the laterality movement. The subjective result, as reported by the patient, was the absence of the previously felt discomfort at the active craniocervical mobility test, in the left laterality movement.



Figure 3. Posture adopted 15 minutes after the normalization maneuver C1, C2 (improvement at the level of the triangle of the waistline).



Figure 4. Posture adopted 15 minutes after the normalization maneuver C1, C2 (rectification of the center line of the cranium).

A postural realignment has to consider always the active causes that generate the first asymmetries and the pathological indicators that maintain them. In the present case, the craniocervical asymmetry was generated by a primary rotation of the C2 vertebra. According to the observations of the orthodontists, this rotation might have significantly been amplified by a dental occlusal problem, what we can also confirm, considering that, also at this level, the contacts between the arcades are uniform and better distributed in position of initial asymmetry and after the C1, C2 derotation some contacts in the posterior group are lost.

Although the malocclusion was implied in the accentuation of the C1, C2 rotation, this cannot be considered the primary cause of the imbalance from this level, the bipupilar and occlusal axes inclined in the same direction confirming the organization of these tissues in a certain asymmetry from the primary and transitional dentition periods. During the last years, by adopting a sedentary position, the patient maintained this imbalance also through an ascendant mechanism (of multidirectional sacral lumbar instability).

DISCUSSION

The manual derotation of C1, C2 vertebrae creates conditions for a long-term effective postural rehabilitation, once the fascial restrictions and the asymmetries at the bottom of the cranium, considered to back the vicious circle of the postural syndrome, are cancelled.⁸ These postural syndromes are always responsible for the occurrence of the symptoms, but, unfortunately, the pain appears after many years from the installation of the first pathological changes. Therefore, the therapeutic strategies must take into account an approach of all the tissues that suffered during the adaptation process, tissues that are distributed all over the body surface, with representations that differ dependent on the area.

Most of the times the patient memorizes the asymmetric schemas, adopts and maintains them involuntarily, rebalancing of the postural system being erroneously perceived as unnatural. In order to solve this perception conflict, introducing a program of proprioceptive reeducation in the therapeutic plan is mandatory.

The identification of all the sources of the postural disorders is important, from the receptors to the tissues adapted to a new schema considered by the postural system as being ideal regarding the energetic consumption. But, the most important aspect is represented by the interruption of the vicious circle in the key area, the most active one regarding the induced negative effects, even though this key area is limited to small sized segments, with balance rates of millimeters.

A very important aspect is represented by another category of tension sources for the muscular tissues, and namely bruxism, where a psychotherapeutic intervention is necessary.

The result of this first intervention in the present case adds another confirmation to what we have noticed during our clinical practice, namely that not the pain becomes chronic, but this is only a normal response to the chronic course of a biomechanical imbalance, with negative impact upon the strongly innervated tissues, their permanent irritation causing the "corticalization" of the painful syndrome and thus the patient's false invalidating perception that his problem could have solutions only at the level of symptoms control.

REFERENCES

1. Sinnott PL, Dally SK, Trafton J, Goulet JL, Wagner TH. Trends in diagnosis of painful neck and back conditions, 2002 to 2011. *Medicine (Baltimore)* 2017; 96: e6691. doi:10.1097/MD.00000000000006691.
2. Wolsko PM, Eisenberg DM, Davis RB, Kessler R, Phillips RS. Patterns and perceptions of care for treatment of back and neck pain: results of a national survey. *Spine (Phila Pa 1976)* 2003; 28: 292-7.
3. Webb R, Brammah T, Lunt M, Urwin M, Allison T, Symmons D. Prevalence and predictors of intense, chronic, and disabling neck and back pain in the UK general population. *Spine (Phila Pa 1976)* 2003; 28: 1195-202.
4. Daffner SD, Hilibrand AS, Hanscom BS, Brislin BT, Vaccaro AR, Albert TJ. Impact of neck and arm pain on overall health status. *Spine (Phila Pa 1976)* 2003; 28: 2030-5.
5. Borghouts JA, Koes BW, Bouter LM. The clinical course and prognostic factors of non-specific neck pain: a systematic review. *Pain* 1998; 77: 1-13.
6. Falla D. Unravelling the complexity of muscle impairment in chronic neck pain. *Man Ther* 2004; 9: 125-33.
7. La Touche R, París-Alemany A, von Piekartz H, Mannheimer JS, Fernández-Carnero J, Rocabado M. The influence of cranio-cervical posture on maximal mouth opening and pressure pain threshold in patients with myofascial temporomandibular pain disorders. *Clin J Pain* 2011; 27: 48-55.
8. Bakhtadze MA, Kuzminov KO, Bolotov DA. Manual therapy in non-specific neck pain. *Zh Nevrol Psikhiatr Im S S Korsakova*. 2017;117(2):49-52. (in Russian).

Rehabilitation of children with arthrogryposis

Рехабилитација деце са артрогрипозом

Oliver Milosevic¹, Emilija Miletic¹, Dejan Jeremic²

Оливер Милошевић¹, Емилија Милетић¹, Дејан Јерemiћ²

1. College of Health Studies, Cuprija, Serbia

2. Faculty of Medical Sciences University of Kragujevac, Kragujevac, Serbia

1. Висока медицинска школа струковних студија, Ћуприја

2. Факултет медицинских наука Универзитета у Крагујевцу, Крагујевац

PRIMLJEN 26.05.2017.

PRIHVACEN 03.11.2017.

RECEIVED 26.05.2017.

ACCEPTED 03.11.2017.

ABSTRACT

Arthrogryposis is a congenital, multiple and non-progressive deformation of the joints, which is characterized by a multiple contractures of the joints at the child's birth. Stiff joints are cylindrical in shape, retaining usual contours, with partially erased muscle and skin outlines. The classic form of arthrogryposis is usually referred to as amyoplasia in the current literature. The case presented here is of a female child aged 17, with the diagnosis of Arthrogryposis multiplex, categorized as mildly mentally disabled, semi-mobile and using wheelchair. The female subject is with deformities of both upper and lower extremities and is completely dependent on the help of another person in matters of usual daily activities, such as maintaining her personal hygiene and satisfying her basic living needs, also in practicing her basic skills. The rehabilitation plan is grounded upon the diagnosis of disease, as well as on the results based on a functional assessment. The rehabilitation plan included daily exercises, passive exercises for lengthening of the soft tissue structures, active sustained exercises, active exercises and those with load on all joints according to the estimation made by the manual muscle test. The plan was being implemented during the research over the course of one whole month. The patient cooperated greatly and was motivated to work.

Treating children with arthrogryposis requires cooperation between physiatrists, surgeons, physiotherapists, occupational therapists, social workers, orthotics, with early and complete engagement of parents. Therefore, the treatment of arthrogryposis necessitates to be approached by all aforementioned experts as a team.

Key words: congenital abnormalities; musculoskeletal abnormalities; arthrogryposis; physical and rehabilitation medicine; adolescent.

АПСТРАКТ

Артрогрипоза је урођена, вишеструка и непрогресивна деформација зглобова, које се карактеришу мултиплим контрактурама зглобова на рођењу детета. Укочени зглобови имају цилиндричан облик, задржане контуре и делимично избрисан рељеф мишића и коже. Класичан облик артрогрипозе се у новијој литератури обично зове амиоплазија. Приказан је случај женског детета узраста 17. година са дијагнозом Arthrogryposis multiplex, категорисана као лако ментално ометена, полупокретна и користи инвалидска колица. Код испитанице присутни су деформитети горњих и доњих екстремитета и у потпуности је зависна од помоћи друге особе када су у питању свакодневне уобичајне активности одржавања личне хигијене и задовољења основних животних потреба и вештина. План рехабилитације се заснива на дијагнози болести, као и на резултатима добијеним на основу функционалне процене. План рехабилитације обухватао је примену свакодневних вежби, пасивних вежби за истезање мекоткивних структура, активно потпомогнутих вежби, активних вежби и активних вежби са оптерећењем у свим зглобовима према оценама на мануелном мишићном тесту. План је спровођен за све време истраживања у трајању од месец дана. Испитаница је одлично сарађивала и била мотивисана за рад.

Лечење деце са артрогрипозом захтева сарадњу физијатра, хирурга, физиотерапеута, радног терапеута, социјалног радника, ортотичара, уз рано и потпуно укључивање родитеља. Дакле, лечење артрогрипозе захтева тимски приступ свих стручњака.

Кључне речи: конгениталне абнормалности; мишићноскелетне абнормалности; артрогрипоза; физикална и рехабилитациона медицина; адолесцент.

CORRESPONDENCE / KORESPONDENCIJA

Oliver Milosevic, College of Health Studies, Cuprija, Serbia, Lole Ribara 1/2, 35120 Cuprija, Serbia, Phone. +381 60 6090906, e-mail: olivermilosevic@gmail.com

Оливер Милошевић, Висока медицинска школа струковних студија, Ћуприја, Лоле Рибара 1/2, 35120 Ћуприја, Тел. +381 60 6090906, е-маил: olivermilosevic@gmail.com

INTRODUCTION

Morphological changes of locomotor apparatus which propagate bigger or smaller functional distresses are called body deformities. Deformities are not so rare phenomenon in children. According to a research carried out in conformity with the recommendations of World Health Organization, 1000 examinees had been scrutinized, with results pointing out that 36% of children is without deformities, 55% with one deformity, and 9% with more than one deformity detected. By type of causer, body deformities are divided into: congenital (in-born) and acquired deformations. Congenital disorders are structural defects of tissues and organs which originated during morphogenesis, the ones that are present and visible at birth. Different kinds of anomalies are conditioning or following different disorders in physical and mental functioning, reflecting on one's social status and function. Congenital deformities of newborn child which occur in praxis (minor or major malformations) are not directly life endangering and they do not require urgent therapeutic measures. Nevertheless, certain congenital deformities ought to be recognized immediately after birth, already in delivery room, so the proper therapeutic measures could be taken in order to prevent serious endangering of a child's life.¹⁻³

Arthrogryposis is a congenital, multiple and non-progressive deformation of the joints, which is characterized by a multiple contractures of the joints at the child's birth. Stiff joints are cylindrical in shape, retaining usual contours, with partially erased muscle and skin outlines. The classic form of arthrogryposis is in current literature usually referred to as amyoplasia.³⁻⁵ The main cause of arthrogryposis is not quite known, but there are several hypothesis, which include viral infections during pregnancy, fetal hyperthermia (overheating of an embryo), disorders in blood provision of an embryo, decreased amount of amniotic fluid, usage of some medicaments, alcohol and drugs during pregnancy. According to some theories, influenza virus, measles and other viral infections in the first months of pregnancy are responsible for the occurrence of arthrogryposis. There are two clinical forms, neuropathic and myopathic. Tendon reflexes in both clinical forms are lowered or silent, while sensibility is preserved. Small, vaguely bounded area of mildly red pigmented skin can be seen between eyebrows, a so-called stork bite. Skin above the joints caught by arthrogryposis can be writhed, while it is as a whole thin, due to a reduced amount of subcutaneous tissue. Extremities are fusiform or cylindrical in shape, and muscles are atrophic, while some muscle groups can be completely missing. Joints are subluxated, or completely luxated, especially hips and knees.⁶⁻⁸

Arthrogryposis is a deformity which, in addition to surgical interventions, immediately after delivery, also requires a long process of rehabilitation as one of the most important components of a treatment. In the process of rehabilitation of body deformities, early and continuous rehabilitation is of utmost significance. Rehabilitation treatment is preceded by scrutinizing of psychological, physical, physical, social and professional consequences of deformities.⁹ There are no universal methods of rehabilitation, as they are being adapted to a given case with an importance of continuously carrying out the process of rehabilitation. Early rehabilitation can lead to significant functional capacitating altogether with greater abilities of a child for daily life activities (DLA). Continuous treatment can contribute to an education process and later employment of such children. Family is also to be included in rehabilitation process and by the methods of counselling, sociotherapy and education of parents are being applied. Education refers to a training in properly doing the exercises, including their appropriate duration, to possible combinations of exercises and requisites to be used, as well as to various kinds of improvisation in exercising in domestic conditions. Parents should be advised to accept their child as it is and guided to acknowledge it's real abilities. Rehabilitation is an interdisciplinary activity in which all members of a team are equal. Though the process of rehabilitation lasts longer than other forms of medical treatment, at one moment it must come to an end. Usually it's the moment when therapeutic goals are achieved, and the patient had been made feasible up to the maximal limit.¹⁰⁻¹² Nevertheless, if the achieved status is not being kept up, body deformity could easily be reverted to a previous condition, sometimes resulting in an even more severe clinical picture than before, especially in children. It is necessary to educate the patient and to give him knowledge from the area that his deformity belongs to, to inform him how the rehabilitation is going to be carried out, which are possible complications and consequences of absence of therapy. Thereby the patient is aware of situation and actively takes sides by the physiotherapist.¹³⁻¹⁶

Nowadays body deformities are great disturbing factor in child's growth and development. Besides esthetical problems, they cause many other health problems to a man, which are ought to be in due time therapeutically taken care of. Treating of body deformities requires close cooperation of physical medicine therapist and physicians in order to diagnose and administer adequate therapy (corrective exercise, using of certain medical apparatus, surgical intervention).¹⁷⁻²⁰

CASE REPORT

Psychophysical status

Female patient, aged 17, categorized as mildly mentally disabled, semi-mobile and in wheelchair. Due to a degree of her invalidity and the fact that she's mentally challenged, her hygiene habits and habits of self-help are not developed. She does not control her physiological needs. Her verbal abilities are well developed and, pursuant to her age and social setting, it can be said that has got a rich vocabulary. She understands instructions and requests and responds in a verbally adequate manner. She's a sweet, smiling girl, always in a mood for social communication. She is interested in all happenings inside the group, in the beginning a little bit insecure at the first contact with previously unknown people, but capable of quick accommodation with a bit of a support. She shows initiative and motivation for taking part of the group activities, putting an effort into it. Regardless of hand deformities, she's trying to carry out her activities successfully; she can differentiate and name colors, she's well oriented in space and time, she can enumerate days of the week and she knows of how many seasons a year consists. She's not a conflictive person. She's fond of listening to music, likes to look nice and neat, loves to spend time with adults who take care of her. Most of the day she spends in the wheel chair, communicating with other children and watching TV. One comes away with an impression that the patient possesses solid socially cognitive and psychic abilities which, unfortunately, hadn't been adequately developed due to a non-stimulating and untimely working with her.

Health status

The patient was diagnosed with arthrocrypsis multiplex at birth. She has deformities of upper and lower extremities, she's semi-mobile and uses wheelchair. Her occasional ear inflammation is of chronic character. She doesn't control her sphincters. She is overweight. Her menstrual cycle is regular. She doesn't have any other health issues.

Legal status

She was abandoned by both of her parents right after her birth. Since she was born, until 2005, she resided in an asylum in Kulina. Since 2005 she had been transferred to a Home for uninhabited children in Niš, where she is still a resident. Her parents are completely devoid of any parental right.

Self-dependence and self-care

Completely dependent on the help of other person in matters of usual daily activities, self-hygiene maintenance and satisfying basic life needs and abilities. Deformities of upper extremities restrict her in self-dependant nourishment, so she is usually being fed by a nurse. She recognizes all the cutlery during the meal, but she's not capable of using it. She can't self-dependently maintain her personal hygiene, she's not able to wash her face, brush her teeth, wash her hands, nor to take a bath. She likes to be neat and if her clothes get dirty, she asks to change; she recognizes the clothes. She knows how to combine her clothing with weather conditions, but, because of aforementioned deformities, can't dress herself. Having adopted the circadian rhythm, she knows the succeeding of the activities, taking an active participation in workshops. With the support and help from an adult, she get to see a final object of workshop's task, her reactions are in elated and euphoric manner, so that she has always wanted to work some more. When the action is three times repeated, this patient knows by the fourth time to independently iterate it by the sequence of execution, which speaks to a distinct degree that the patient possesses clearly developed scheme of actions necessary for performing certain activity.

Social status

The patient easily establishes social contacts, considering the fact that her verbal abilities are well developed; she actively interacts with adults and her age-mates from group. She positively accepts socially eligible behaviour, she's adapted to an environment, very companionable, always in cheerful mood, and when something bothers her or she doesn't find it suitable for her, she doesn't verbalize that, but withdraws to herself and bursts into tears. The patient takes an educational group as her own, developing distinctive feeling of belonging and she grows a protective attitude towards each member of the group. She spends most of the time with the patient, who occasionally gives her support and helps her with feeding or by passing her things she makes a bid for. The patient knows names of every member of the group, names of all adults in Home, her attention is properly directed and she easily makes a direct contact. Because of her inability to shake hands she utilizes usual stereotypes: winking and blowing kisses.

Table 1. Patient's problems

Problems			
Social skills	Communication skills	Self-dependence and self-care	General health
	Occasional stereotypical communication	Completely dependent on other people's care and attendance	Chronic ear inflammations
		Limited coordination of upper and lower extremities	Increased body mass
Priority problem: due to a constant confinement to the wheelchair, together with good appetite, possible risks are burdening of spinal column because of a body mass increase, by which is her health condition endangered			
Goal: preserving health condition and maintaining body mass at lower level, as well as preserving and improving communication and social skills			



Figure 1. Patient in wheelchair



Figure 2. Stationary position

PLAN OF REHABILITATION

Plan of rehabilitation is based upon primary diagnose as well as upon results pursuant to functional estimation. It had been carried out over the course of the research lasting one month. The patient cooperated greatly and had been motivated to work. On the first day, after getting acquainted with the patient, a functional procedure had been done, including identifying contractures, estimating muscle strength, measuring an amplitude of joints movements, measuring size and length of extremities, estimating motor self-dependence. After determining existing abilities of the patient concordant to existing deformities, the plan of rehabilitation had been made, meaning a continuous treatment. The rehabilitation plan included daily exercises, passive exercises for lengthening of the soft tissue structures, active sustained exercises, active exercises and those with load on all joints according to the estimation made by the manual muscle test. The plan for muscles of head and neck meant daily performing of active exercises with growing number of iterations

for increasing the muscle strength. The plan for muscles of upper extremities meant performance of passive exercises for lengthening of the soft tissue structures, reaching the pain limit, as well as performing active sustained exercises for increasing the amplitude of movements. The plan for muscles of lower extremities meant performing of active exercises for tight muscles, passive lengthening by positioning relying on a gravity in the knee joint, as well as sustained active exercise for foot. Daily agenda of breathing exercises, as well as turning on the side and positioning, had been planned. Daily increase of resistance, where it is possible, as well as number of repeating of movements, had been also planned. The plan for improvement of transfer from bed to wheelchair had been also made

CARRYING OUT OF REHABILITATION

Rehabilitation treatment had been carried out over the course of 30 days. Treatment included performing of kinesiotherapy by the patient in her bed, in different positions (mostly in a supine position and side position), with verbal communicating and explaining how is each of exercises to be done and why should it be done, on demand of the patient (figures 1-5). The progress could be noticed on daily basis as well as the importance of continuous work concerning rehabilitation treatment.

Passive exercises, sustained active exercises and active exercises of upper and lower extremities, in all areas where it was possible to perform any kind of a movement because of existing deformities together with great degree of contractures in certain joints, had been done with the patient.



Figure 3. Performing a movement of extension in both arms shoulders, a passive movement



Figure 4. Performing a movement of abduction in left arm shoulder, a passive movement



Figure 5. Performing a movement of extension in hip with existing contracture in knee

Finer handling was also exercised with the patient, which she managed to improve up to limits of her possibilities, meaning thus much as her existing deformities could allow. (figures 6 and 7)



Figure 6. Exercise, part 1



Figure 7. Exercise, part 2

MENTAL ESTIMATION

The patient had shown significant communication abilities, she had been very curious, wanting to know everything related to rehabilitation treatment. Through conversation, Jane Doe had displayed various interests for the world around her as well knowledge of her own disease. It's been noticed that the patient is of a lower average of intelligence but with a significant educational negligence. Insufficient work together with relatively recent starting with school concerning her age point out why the patient still hasn't got knowledge from certain social fields. She's currently attending School for mentally disabled children in Niš, she's in the fifth grade of primary school and an excellent pupil with proper behavior. Over the course of the research the patient made an extraordinary advance in both mental and social aspects, indicating the significance of continuous treatment.



Figure 8. The patient is drawing

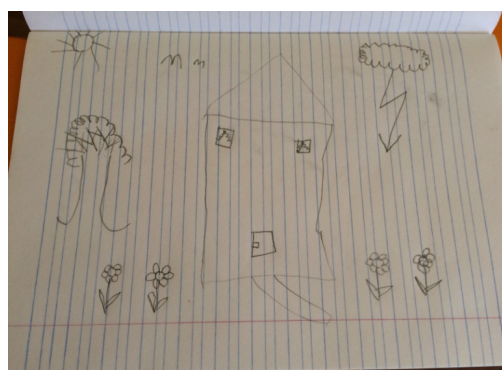


Figure 9. The drawing of the patient

COMPARATIVE STATUS

Table 2. Comparative status of the research according to the functional estimation 1

Parameters of the research		Before the research	After the research
Inspection of the deformities	hip	luxation	the state remained unaltered
	knee	flexion contracture	the state remained unaltered
	foot	equinus – right equinovarus - left	the state remained unaltered
	shoulder	adduction contracture	the state remained unaltered
	elbow	extension contracture	the state remained unaltered
	hand	flexion contracture	the state remained unaltered
	spinal column	lumbar scoliosis and thoracic kyphosis	the state remained unaltered
Inspection of the position	supine	conditioned by deformities	alleviated
	prone	somewhat difficult	alleviated
	on side	conditioned by deformities	alleviated
	sitting	in the wheelchair	in the wheelchair, alleviated
		impossible	the state remained unaltered
Transfer	from bed to wheelchair	with a help from another person	alleviated
	from wheelchair to bed	with a help from another person	alleviated

Table 3. Comparative status of the research according to the functional estimation 2

Parameters of the research		Before the research	After the research
Manuel muscle test	muscles of head and neck	flexion 3+ extension 3+ lateral flexion 3+	flexion 4 extension 4 lateral flexion 4
	muscles of upper arm	flexion 2- extension 1 abduction 2- adduction 1 external rotation 1 internal rotation 1 horizontal abduction 2- horizontal adduction 2-	flexion 2 extension 1 abduction 1 adduction 1 external rotation 1 internal rotation 1 horizontal abduction 2 horizontal adduction 2
	muscles of fore arm	flexion 1 extension 1 supination 1 pronation 1	flexion 1 extension 1 supination 1 pronation 1
	muscles of hand	flexion 1 extension 1 abduction 1 adduction 1	flexion 2- extension 1 abduction 1 adduction 1
	muscles of trunk	flexion 2 extension 2 lateral flexion 2 rotation 2-	flexion 2+ extension 2+ lateral flexion 2 rotation 2
	muscles of upper leg	flexion 3- extension 3- abduction 3 adduction 3 external rotation 2- internal rotation 2-	flexion 3 extension 3 abduction 3+ adduction 3+ external rotation 2- internal rotation 2
	muscles of lower leg	flexion 1 extension 1	flexion 1 extension 1
	muscles of foot	flexion 1 extension 1 abduction 1 adduction 1	flexion 1 extension 1 abduction 1 adduction 1

Table 4. Comparative status of the research according to the functional estimation 3

Parameters of the research		Before the research	After the research
After the research	head and neck	flexion 25° extension 20° lateral flexion 23° rotation 50°	flexion 32° extension 26° lateral flexion 30° rotation 60°
	hand	shoulder flexion 70° shoulder extension 10° shoulder abduction 30° shoulder adduction 10° shoulder internal rotation 15° shoulder external rotation 15° forearm flexion 20° forearm extension 20° forearm pronation 10° forearm supination 10° hand flexion 15° hand extension 5° hand abduction 2° hand adduction 3°	shoulder flexion 76° shoulder extension 12° shoulder abduction 32° shoulder adduction 10° shoulder internal rotation 15° shoulder external rotation 15° forearm flexion 20° forearm extension 20° forearm pronation 10° forearm supination 10° hand flexion 15° hand extension 6° hand abduction 2° hand adduction 3°
	leg	hip flexion 50° hip extension 15° hip abduction 30° hip adduction 15° hip external rotation 15° hip internal rotation 10° knee flexion 8° knee extension 3° foot flexion 2°f foot extension 2° foot eversion 2° foot inversion 2°	hip flexion 60° hip extension 17° hip abduction 32° hip adduction 16° hip external rotation 16° hip internal rotation 11° knee flexion 8° knee extension 3° foot flexion 2° foot extension 2° foot eversion 2° foot inversion 2°
	trunk	flexion 35° extension 10° lateral flexion 5° rotation 5°	flexion 45° extension 15° lateral flexion 5° rotation 5°

Table 5. Comparative status of the research according to the functional estimation 4

Parameters of the research		Before the research	After the research
Size of extremities	upper arm	upper-level - 32 cm lower-level - 30 cm	upper-level - 30 cm lower-level - 29,5 cm
	elbow	29 cm	29 cm
	fore arm	30 cm	29 cm
	wrist	15,5 cm	15,5 cm
	hand	13,5 cm	13,5 cm
	upper leg	upper-level - 65 cm middle-level - 52 cm lower-level - 46 cm	upper-level - 63 cm middle-level - 51cm lower-level - 44 cm
	knee	47 cm	46 cm
	lower leg	42 cm	41 cm
	hock	29 cm	29 cm
Length of extremities		arm	the state remained unaltered
		leg	the state remained unaltered

DISCUSSION

Multiple congenital contractures or arthrogryposes are visible state of limited motility of joints at child's birth. There are more than 150 diseases associated with similar clinical picture. Amyoplasia congenita is today mostly used as a name for a classical arthrogryposis. It covers 43% of all multiple congenital contractures. The incidence of arthrogryposis is 1:3000 newborns by us, as well as it is throughout the world. The manner of inheritance remains unknown. Two types are distinguished: neuro-pathic type, which is present in 90% of cases, and myogenic type, which is present in 10% of cases of children with arthrogryposis. In 60% of patients there is an equal hold on all limbs which are in a characteristic symmetrical position. Both sexes are equally frequent.

Deformities of a body, including arthrogryposis, are today a widespread problem, especially in youth. When deformities of a skeleton are taken into consideration altogether, it is even one third of children of school age that have some kind of a deformity, and there are even more deformities occurring at the same time in a certain number of children. For instance, deformities of spinal column are stated in 15,4% of school children, so that they represent one of primary health problems in that category of citizens. Deformities of a foot are registered in 17,6% of pupils, meaning that more than every tenth child has that kind of a deformity. 95% of children suffering from arthrogryposis have some kind of a spinal column deformity beside the joints contracture; mostly it is scoliosis, as well as foot deformities, prevalently in a form of an equinovarus component. Research carried out by the

request of World Health Organization has confirmed that in a treatment of deformities, after surgical interventions, the utmost efficiency is provided by medical rehabilitation, and if it is carried out on a regular and continuous basis, 50% of children is 100% efficient.

Rehabilitation treatment of arthrogryposis is the same, both throughout the world, and with us, and it is in the first place based upon early and continuous rehabilitation, and also upon a teamwork and an approach to a patient. The purpose of treatment is to achieve the best motility of joints or to accomplish the position of joints suitable for their function. Medical rehabilitation is being started with as early as possible. It is necessary to carry out the joints' motility exercises, immobilization should be avoided, and light splints for the maintenance of the accomplished level of joints' motility. For the purpose of making walking possible, surgical treatment is mostly performed on feet. Treatment is lasting and complicated, and recidives of deformities are frequent.

Motoric capacitating level of children with arthrogryposis depends on a great number of factors like duration of a rehabilitation treatment, motivation of parents for improving the state of their child, degree of deformity's severity, formation of a rehabilitation team. On the other hand, a degree of a mental development of children with arthrogryposis has much better prognosis, because, according to statistical data, 90% of children with arthrogryposis has their intelligence preserved and if they are don't get to be uncared-for they can achieve significant results.

Rehabilitation process is to be started from getting acquainted with a structure of a person with a handicap. Sometimes, during the rehabilitation, it is necessary to make an impact on those elements of a personality which are alterable, and therefore to act upon a structure of a handicapped personality, in order to realize an adaptation on a handicap more effectively and to end an integration process more successfully. Educational aspect, meaning education, refers to acquiring knowledge, changing attitudes towards oneself and regarding social values, as well as to realizing education and professional capacitating programs. Speaking of handicapped persons, a continuous treatment of rehabilitation, starting from their birth, should be comprehensive and appropriate in order to make a contribution to an improvement of everyday life of handicapped persons up to maximum limits of their recovery. If a handicapped person is enabled to produce a capital gains, or to produce enough to keep it's needs catered, it is considered that the economical aspect is fully satisfied, because being that way, one becomes useful member of a community. Persons with disturbances in

their development, bearing in mind that this group is primarily consisted of children and young adults, should be included into school, work and wider social setting inside the frame of society. Throughout the world, as well by us, thanks to medical interventions and advanced scientific achievements, mortality is decreased, but the number of children born with anomalies and disturbances in development is still growing. Arthrogryposis is a very complex disease which brings out a whole scope of problems not only to a child who suffers from it but also to people in its surrounding. Nevertheless, from a humane point of view, we should never give up on persons such as these, but put an effort to help them, as much as possible, to integrate themselves into a society, as well as work on developing the rest of their functions, especially intellectual.

CONCLUSION

As it can be seen from the research on a display, continuous working with those children, even over the course of one month, could make a great contribution and have significant results regarding questions of muscle strength, range of movements, transfer, daily life activities, as well as communication and intellectual skills, especially when it concerns a child who hadn't got an opportunity to make an advancement in education. Working with children who suffer from arthrogryposis requires a lot of patience and love, but it must be pointed out that even small steps mean great success for them.

REFERENCES

1. Jovanović L, Kovačević R, Ereš S, Kljajić D. The fundamentals of kinesiotherapy. Belgrade: L. Jovanović, 2013. (in Serbian).
2. Roshal LM, Novoselova IN, Valiullina SA, Ponina IV, Machalov VA, Vasilieva MF, Lukjanov VI. The experience with the early rehabilitation of the children presenting with the vertebral cerebrospinal injury. *Vopr Kurortol Fizioter Lech Fiz Kult* 2016; 93: 41-50. (in Russian).
3. Jevtić MR. Physical medicine and rehabilitation. Kragujevac : Medicinski fakultet, 1999.
4. Veljković M. Medical rehabilitation of painful spinal column syndrome. Kragujevac: Medical Faculty, 2009.
5. Jevtić M, Marić V. Rehabilitation of post-traumatic and orthopedic diseases. Foča: Medical Faculty, 2009.
6. Baird HW. Neurological evaluation of infants and children Cambridge: Cambridge University Press, 2004.
7. Banaszek G. Vojta's method as the early neurodevelopmental diagnosis and therapy concept. *Przegl Lek* 2010; 67: 67-76. (in Polish).
8. Попадић-Гаћеша Ј, Барак О, Драпшин М, Караба-Јаковљевић Д, Клашња А, Галић В. The neurophysiology practice book. Novi Sad: Medical Faculty, 2014. (in Serbian).
9. Minden K. What are the costs of childhood-onset rheumatic disease? *Best Pract Res Clin Rheumatol* 2006; 20: 223-40.
10. Hogrel JY, Ollivier G, Desnuelle C. Manual and quantitative muscle testing in neuromuscular disorders. How to assess the consistency of strength measurements in clinical trials? *Rev Neurol (Paris)* 2006; 162: 427-36. (in French).
11. Bernstein RM. Arthrogryposis and amyoplasia. *J Am Acad Orthop Surg* 2002; 10: 417-24.
12. Van Heest A, James MA, Lewica A, Anderson KA. Posterior elbow capsulotomy with triceps lengthening for treatment of elbow extension contracture in children with arthrogryposis. *J Bone Joint Surg Am* 2008; 90: 1517-23.
13. Mennen U. Arthrogryposis multiplex congenita: functional classification and the AMC Disc-o-Gram. *J Hand Surg Br* 2004; 29: 363-7.
14. Vermaak DP. Arthrogryposis multiplex congenita of the upper limb. *SA orthop J* 2012; 11: 34-9.
15. Kalampokas E, Kalampokas T, Sofoudis C, Deligeorgoglou E, Botsis D. Diagnosing arthrogryposis multiplex congenita: a review. *ISRN Obstetrics and Gynecology* 2012; 2012: 264918. doi:10.5402/2012/264918.
16. Binkiewicz-Glinska A, Sobierajska-Rek A, Bakula S, Wierzba J, Drewek K, Kowalski I, Zaborowska-Sapeta K. Arthrogryposis in infancy, multidisciplinary approach: case report. *BMC Pediatr* 2013; 13: 184. doi: 10.1186/1471-2431-13-184.
17. Kimber E, Tajsharghi H, Kroksmark AK, Oldfors A, Tulinius M. Distal arthrogryposis: clinical and genetic findings. *Acta Paediatr* 2012; 101: 877-87.
18. Binkiewicz-Glińska A, Wierzba J, Szurowska E, Ruckeman-Dziurdzińska K, Bakuła S, Sokołów M, Reńska A. Arthrogryposis multiplex congenital - multidisciplinary care - including own experience. *Dev Period Med* 2016; 20: 191-6.
19. Mallikarjunappa B, Shruthi KM. Arthrogryposis: a case report. *JIMSA* 2013; 26: 221-2. <http://medind.nic.in/jav/t13/i4/javt13i4p221.pdf>
20. Oberg GK, Campbell SK, Girolami GL, Ustad T, Jørgensen L, Kaarensen PI. Study protocol: an early intervention program to improve motor outcome in preterm infants: a randomized controlled trial and a qualitative study of physiotherapy performance and parental experiences. *BMC Pediatrics* 2012; 12: 15. doi: 10.1186/1471-2431-12-15.

Acute cardiac failure during influenza A (H1N1) treated with noninvasive ventilation

Primena neinvazivne ventilacije kod akutne srčane insuficijencije uzrokovane influencom A (H1N1)

Romana Susa¹, Vojislav Cupurdija^{1,2}, Ljiljana Novković^{1,2}, Zorica Lazić^{1,2}, Marina Petrović^{1,2}, Bojan Djokić², Anita Ivosević², Marko Vuleta² and Ivan Cekerevac^{1,2}

1. Clinical Centre Kragujevac, Clinic for Pulmonology, Kragujevac, Serbia

2. Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia

PRIMLJEN 05.02.2017.

PRIHVAĆEN 06.04.2017.

Romana Suša¹, Vojislav Čupurdija^{1,2}, Ljiljana Novković^{1,2}, Zorica Lazić^{1,2}, Marina Petrović^{1,2}, Bojan Đokić², Anita Ivošević², Marko Vuleta² and Ivan Čekerevac^{1,2}

1. Klinički centar "Kragujevac", Klinika za pulmologiju, Kragujevac

2. Fakultet medicinskih nauka, Univerzitet u Kragujevcu, Kragujevac

RECEIVED 05.02.2017.

ACCEPTED 06.04.2017.

ABSTRACT

The female patient, 64 year old, was hospitalized in the intensive care unit of Clinic for Pulmonology, Clinical Center Kragujevac, due to fever, dry cough, dyspnea, fatigue and swelling of lower limbs. The symptoms started abruptly, 4 days before the admittance to the hospital. Upon admission, somnolence and signs of central cyanosis were noted. Auscultatory finding on the lungs was characterized by bilateral inspiratory crackles, while cardiac sound was silent, HR=120/min, TA=110/60mmHg. Analysis of arterial blood gases registered acute respiratory failure: pO₂=5.1kPa, pCO₂= 9.2kPa, pH=7.45, SAT=62%. Chest X-ray showed bilateral condensations in the lung parenchyma, predominantly in parahilar area. Cardiac shadow was enlarged. Laboratory tests showed increased value of pro-BNP (4086 pg/mL) (reference values: < 125 pg/mL – negative; 125–400 pg/mL – intermediate; > 450 pg/mL – heart failure). Echocardiographic exam upon admittance showed dilated cardiac cavities, global hypokinesis and ejection fraction of 35%. Noninvasive ventilation (NIV) treatment was started (BiLEVEL, IPAP 26cmH₂O, EPAP 6cmH₂O) at first continuously and then only during the night, with intense cardio-diuretic therapy. On the fifth day of hospitalization, the results of virology analyses confirmed influenza A (H1N1) infection. On the 6th day, gas exchange was normalized, complete radiological regression occurred, as well as normalization of echocardiographic exam finding. Our case shows that influenza A (H1N1) virus infection may be complicated by acute cardiac failure. If started on time, NIV treatment with simultaneous cardio-diuretic therapy, could have a positive impact on the resolution of acute heart failure during H1N1 virus infection.

Key words: respiratory insufficiency; noninvasive ventilation; influenza A virus, H1N1 subtype; heart failure; echocardiography.

APSTRAKT

Bolesnica stara 64 godine hospitalizovana je u našoj klinici u jedinici intenzivne nege zbog visoke febrilnosti, suvog kašlja, gušenja, lakog zamaranja i otoka potkolenica. Navedeni simptomi počeli su naglo 4 dana pre prijema. Na prijemu pacijentkinja somnolentna sa znacima centralne cijanoze. Auskultatornim nalazom na plućima registruju se pukoti u inspirijumu obostrano, dok su srčani tonovi mukli HR=120/min, TA=110/60mmHg. Uzete gasne analize arterijske krvi pokazale su akutnu globalnu respiratornu insuficijenciju: pO₂=5.1kPa, pCO₂= 9,2 kPa, pH=7.45, SAT=62%. Radiološkim pregledom pluća registrovane su kondenzacije plućnog parenhima obostrano, levo i desno dominantno parahilarno, srčana senka uvećana. U laboratorijskim analizama registrovane su povišene vrednosti proBNP (4086) (referentne vrednosti negativan < 125; siva zona 125-400; sigurna insuficijencija > 450 pg/ml). Ehokardiografski nalaz na prijemu pokazao je dilatirane srčane šupljine, globalnu hipokineziju i EF od 35%. Započeli smo tretman NIV-om (BiLEVEL, IPAP 26, EPAP 6cmH₂O) kontinuirano a potom samo u toku noći uz intenzivnu kardio-diuretsku terapiju. Petog dana hospitalizacije, pristigao je virusološki rezultat, koji je potvrdio infekciju virusom gripa A (H1N1). Šestog dana dolazi do normalizacije gasne razmene, kompletne regresije na kontrolnoj radiografiji pluća i normalizacije ehokardiografskog nalaza. Naš prikaz pokazuje da infekcija virusom gripa A (H1N1) može biti komplikovana akutnom srčanom insuficijencijom. Ako se započne na vreme primena NIV-a, uz kardio-diuretsku terapiju, može imati pozitivan uticaj na rešavanje akutne srčane insuficijencije u toku H1N1 virusne infekcije.

Ključne reči: respiratorna insuficijencija; neinvazivna ventilacija; influenza A virus, H1N1 podtip; srčana insuficijencija; ehokardiografija.

CORRESPONDENCE / KORESPONDENCIJA

Romana Susa, MD, Clinical Centre Kragujevac, Clinic for Pulmonology, Kragujevac, Serbia, Phone: +381 64 312 44 02; E-mail: r.susa.86@gmail.com

Romana Suša, Klinički centar Kragujevac, Klinika za pulmologiju, Kragujevac, Tel. +381 64 312 44 02; E-mail: r.susa.86@gmail.com

INTRODUCTION

In the last decade viral pandemics had a significant impact on the health of populations worldwide. Pandemic influenza A (H1N1) virus, during 2009, caused more than 18 000 lethal outcomes within the first season.¹ The association of infection with influenza A (H1N1) virus and acute, reversible cardiac dysfunction was noticed during pandemic.^{2,3}

CASE REPORT

64 year old female patient was hospitalized in the intensive care unit of Clinic for Pulmonology, Clinical Center Kragujevac, in a serious general condition. The symptoms started abruptly, 4 days before the admittance to the hospital due to high fever (39°C), dry cough, dyspnea, weakness, fatigue and swelling of lower limbs. Previously, she was treated for hypertension. She is non-smoker. Upon admission, somnolence, high fever (38.4°C), tachycardia (100 bpm), tachypnea (rf: 30/min), with signs of central cyanosis were noted. Auscultatory finding on the lungs was characterized by impaired breathing sound, prolonged expirium, and the mass of bilateral late-inspiratory crackles, while cardiac sound was silent. Pretibial edemas were noted at lower extremities. Analysis of arterial blood gases on admittance registered acute respiratory failure: $pO_2=5.1\text{ kPa}$, $pCO_2=9.2\text{ kPa}$, $pH=7.45$, $SAT=62\%$. Electrocardiogram on admission showed sinus rhythm, with heart rate of 82/min, ST depression in D1, D2, incomplete right bundle branch block. Chest X-ray showed bilateral condensations in the lung parenchyma, diffuse in the left lung and predominantly in parahilar area in the right lung. Cardiac shadow was enlarged. Costophrenic angles were without fluid. (Figure 1).

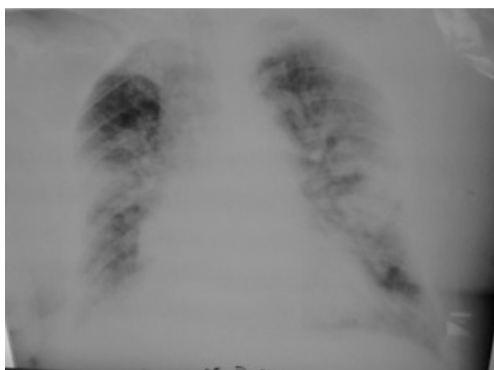


Figure 1. Chest radiography at hospital admission

Laboratory tests on admission showed: WBC within reference value ranges, slightly increased CRP value (25.6 mg/L) (reference value < 5.0 mg/L), cardiospecific markers of myocardial damage within reference value ranges, increased value of pro-BNP (4086 pg/mL). Echocardi-

graphic exam upon admittance showed dilated cardiac cavities, global hypokinesis and ejection fraction of 35%. (EDD 64mm, ESD 23mm, VS 10mm, PW 10mm, EF 35% Simpson, Ao 34mm, LA 42mm, RV 31mm, PA 25mm, MR mild to moderate, TR moderate, SRVP 49mmHg) (Figure 2).

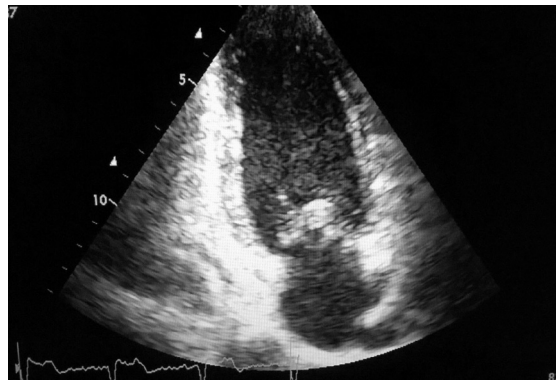


Figure 2. Echocardiography on admission

Suspecting the infection with influenza A (H1N1) virus, throat swab was taken, which was sent to the tertiary institution for definitive confirmation of the diagnosis.

Two hours after the admission, as there was no improvement in oxygenation with strictly controlled oxygen therapy, NIV treatment was started (BiLEVEL, bilevel positive pressure support ventilation. IPAP 26cm H₂O, EPAP 6cm H₂O, back-up rate 24) continuously and then only during the night, with intense cardio-diuretic therapy. During hospitalization, because of the occurrence of moderate hemoptysis and high value of D-dimer (1.77 µg/ml) (reference values: negative < 0,50 5 µg/ml FEU), due to suspicion of pulmonary thromboembolism, MSCT pulmonary angiography was performed, thereby excluding the existence of significant pulmonary embolism, but confirming the hyperintense fluid condensation of the type of ground glass, on both sides in the upper lobes predominantly on left side, which could be attributed to lung congestion (Figure 3)



Figure 3. Pulmonary angiography

On the fifth day of hospitalization, the results of virology analyses confirmed influenza A (H1N1) infection. (Figure 4)



Figure 4. H1N1 confirmation

On the 6th day of hospitalization, gas exchange was normalized (PaO_2 9,4Kpa, PaCO_2 5,7Kpa), as well as echocardiographic exam finding. (EDD 55mm, ESD 35mm, VS 10mm, PW 10mm, EF 50% Simpson, Ao 34mm, LA 39mm, RV 26mm, PA 21mm, MR mild, Tr mild, SRVP 31mmHg). (Figure 5)

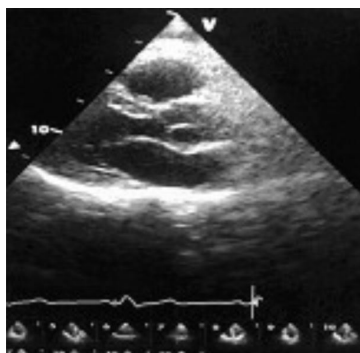


Figure 5. Echocardiography on the 6-th day of hospitalization

Control chest X-ray showed complete regression of previously noted changes (Figure 6).



Figure 6. Chest radiography on hospital discharge

DISCUSSION

Our case report describes the patient with Influenza A (H1N1) virus infection complicated by acute myocardial dysfunction, even though the patient had no prior history of heart failure. Systolic dysfunction that occurs in the acute viral syndrome and passes away after resolution of the viral illness, supports the concept that influenza A (H1N1) is the reason of acute heart failure caused by virus toxic effects on the myocardium².

Reviewing the literature, acute heart failure, in most of the cases, is developing during the first week of illness (3). In the patient that we presented, clinical, laboratory, radiographic and echocardiographic signs of heart failure were registered on admission. Acute heart failure in patients with influenza A (H1N1) infection is usually manifested by viral myocarditis, previous coronary disease exacerbation or worsening of congestive heart failure³.

Although influenza A (H1N1) virus infection is not displayed with signs of heart failure, literature review suggests that the infection with this virus may be associated with cardiac failure and the cardiac arrest as the primary clinical manifestation. In cases, when presented with respiratory tract infections, alongside which there are signs of heart failure, it is necessary to test patients for influenza A (H1N1) virus infection⁵.

According to literature data, independent factors associated with the success of the application of NIV in acute heart insufficiency and influenza A (H1N1) virus infection are hemodynamic stability and presentation of changes (opacification) on radiological examinations of the lungs in less than two quadrants of the lung parenchyma⁶. In our patient, the significant changes were seen in at least three quadrants. Patients treated with NIV had a lower incidence of new infectious complications and an increase in in-hospital survival when compared to those not treated with NIV^{4,7}. Early use of NIV is associated with rapid improvement of gas exchange in the first few hours from the beginning of the application, as it is in our patient⁶. Studies have shown that NIV is efficient in preventing endotracheal intubation in 48% of patients with acute cardio- respiratory insufficiency during the H1N1 infection⁴. In acute heart failure NIV improves cardiac performance by reducing the "preload" and "afterload", improves respiratory function by reducing the work of breathing musculature which, in overall, leads to an improvement in oxygenation⁸.

CONCLUSION

It could be concluded that our case shows that influenza A (H1N1) virus infection may be complicated by acute cardiac failure. If started on time, NIV treatment with simultaneous cardio-diuretic therapy, could have a positive impact on the resolution of acute heart failure during H1N1 virus infection.

REFERENCES

1. Masclans JR, Pérez M, Almirall J, et al.; H1N1 GTEI/SEMICYUC Investigators. Early non-invasive ventilation treatment for severe influenza pneumonia. *Clin Microbiol Infect* 2013; 19: 249-56.
2. Barbandi M, Cordero-Reyes A, Orrego C, Torre-Amione G, Seethamraju H, Estep J. A case series of reversible acute cardiomyopathy associated with H1N1 influenza infection. *MDCVJ* 2012; 8: 42-5.
3. Martin S, Hollingsworth C, Norfolk S, Wolfe C, Hollingsworth J. Reversible cardiac dysfunction associated with pandemic 2009 Influenza A(H1N1). *Chest* 2010; 137: 1195-7.
4. Nicolini A, Tonveronachi E, Navalesi P, et al. Effectiveness and predictors of success of noninvasive ventilation during H1N1 pandemics: a multicenter study. *Minerva Anestesiol* 2012; 78: 1333-40.
5. Wiegand JA, Torgersen C, Bloechlinger S, Takala J, Dunser M. Influenza A(H1N1) infection and severe cardiac dysfunction in adults: A case series. *Wien KlinWochenschr* 2011; 123: 120-3.
6. Moretti M, Cilione C, Tampieri A, Fracchia C, Marchioni A, Nava S. Incidence and causes of non-invasive mechanical ventilation failure after initial success. *Thorax* 2000; 55: 819-25.
7. Brink M, Hagberg L, Larsson A, Gedeberg R. Respiratory support during the influenza A(H1N1) pandemic flu in Sweden. *Acta Anaesthesiol Scand* 2012; 56: 976-86.
8. Contou D, Fragnoli C, Izquierdo AC, Boisser F, Buisson CB, Thille AW. Severe but not mild hypercapnia affect the outcome in patients with severe cardiogenic pulmonary edema treated by non-invasive ventilation. *Ann Intensive Care* 2015; 5: 14. (doi: 10.1186/s13613-015-0055-y).

8. Svetski kongres medicinske mikologije 6 - 9. oktobra 2017. godine, Sava centar i Hotel "Crowne Plaza" u Beogradu

8th Trends in Medical Mycology 6 - 9. October 2017. Sava Centre & Hotel " Crowne Plaza " Belgrade, Serbia

U okviru sve većih potreba za lečenjem gljivičnih infekcija, neinvazivnih, ali u kliničkim uslovima sve više, i invazivnih, dogodila se neočekivana okolnost da 6-9. oktobra 2017. godine Beograd bude domaćin svetskog kongresa medicinske mikologije u Sava centru i hotelu "Crowne Plaza". Organizatori Evropska konfederacija medicinskih mikologa (ECMM) i Grupa za infektivne bolesti Evropske organizacije za istraživanje i lečenje raka (EORTC-IDC) su pripremili čitav niz sadržaja koji bi u stručnom i naučnom smislu pratili aktuelne mikološke trendove, uz ostavljanje mogućnosti ličnog nagoveštaja svakom posetiocu u kom će se pravcu razvijati mikologija. Ovom prilikom ugošćeno je više od hiljadu učesnika iz celog sveta, od Čilea do Japana, od Kanade do Australije. Poseban kvalitet ovom velikom naučnom i stručnom skupu dala je mogućnost interaktivnog glasanja putem „televoting sistema“ (Audience Response Sistem), čime su obezbeđene relevantne povratne informacije od prisutnih slušalaca, a sama izlaganja predavača imala su dvosmerni karakter.

Osmi svetski kongrestrendova u medicinskoj mikologiji je obuhvatio sve aspekte mikologije sa posebnim fokusom na dokazima zasnovan i personalizovani pristup medicinskoj mikologiji, kao i dijagnostičko-terapeutske

integrisanim naporima u potrazi za poboljšanjem postojećih znanja o epidemiologiji, dijagnozi, kliničkom toku i patofiziološkim mehanizmima gljivičnih bolesti. To je bilo mesto za prezentaciju inovacija i komercijalnih alata u medicinskoj mikologiji. Kongres je posebno bio koristan za mlade naučnike da prošire svoja znanja i dobiju nove ideje - od fundamentalnih naučnih pristupa do realizacije kliničke i laboratorijske prakse. Sastanak je predviđao teme koje su od posebnog interesa za medicinske mikrobiologe, mikrobiologe, hematologe, onkologe, lekare koji se bave transplantacijom, intenziviste, imunologe, dermatologe, pedijatre, farmakologe, biologe, molekularne biologe, biohemičare i sve one koji imaju profesionalna i lična interesovanja vezana za medicinsku mikologiju.

Važno je istaći i da su farmaceutske kompanije, Merck Sharp Dohme, Pfizer i Astelas, organizovanjem okruglih stolova sa značajnim temama za svakodnevnu kliničku praksu, uveliko doprinele sveukupnom kvalitetu ovogodišnjeg kongresa. Na osnovu analize ocena učesnika ovaj stručni i naučni skup je veoma uspešno organizovan i realizovan, čime su stvorene realne osnove za dalje poboljšanje kvaliteta upotrebe dijagnostičkih i terapijskih postupaka kod pacijenata.

dr Nikola Rosić

Služba za kliničku farmakologiju
Klinički centar Kragujevac

3. Симпозијум ринолога Србије са међународним учешћем:

„Акутни и хронични риносинуситис – нови трендови у дијагностици и лечењу“, Београд, 16. Март 2018.

The 3rd Symposium of rhinologists of Serbia with international participation: "Acute and chronic rhinosinusitis – new trends in diagnosis and treatment", Belgrade, Serbia, 16th March 2018

Акутни риносинуситис (АРС) је запаљење слузнице носа и параназалних синуса код кога су присутни симптоми отежаног дисања на нос, појачане секреције из носа и постназалне дренаже, бола и притиска у пределу лица и чела и ослабљеног чула мириса (најмање два од наведених симптома) у периоду краћем од 12 недеља. Барем једна епизода АРС се јавља током године у око 10-15% популације. У великој већини случајева АРС је примарно последица вирусних инфекција горњег дисајног пута, док се у малом проценту случајева на вирусну болест надовезује бактеријска инфекција. Компликације акутног бактеријског риносинуситиса су ретке, али могу угрозити живот, те је њихова дијагностика и лечење, конзервативно и/или хируршко, неопходно у најранијем периоду. Хронични риносинуситис (ХРС) се дефинише као запаљење слузнице носа и параназалних синуса, у коме је присутно два или више симптома, међу којима су осећај запушености носа, појачана секреција из носа/постназална дренажа, осећај бола и притиска у пределу лица и чела, ослабљено чуло мириса, са или без ендоскопског налаза полипа у носу и/или слузаво-гнојавог секрета у средњем носном ходнику и/или отока слузнице примарно у средњем носном ходнику и/или налаза на снимцима компјутеризоване томографије (КТ) параназалних синуса који показују оток слузнице остиомеаталног комплекса и/или засенчења шупљина параназалних синуса, у периоду дужем од 12 недеља. Због велике учесталости и честе удружености са другим патолошким стањима (алергијски и неалергијски ринитис, астма, секреторно запаљење

средњег ува), представља велики дијагностички и терапијски проблем.

Планирано је да на овом научном и стручном скупу учествује велики број угледних предавача из Србије и иностранства. На симпозијуму ће бити приказани сви модалитети конзервативног и хируршког лечења акутног и хроничног риносинуситиса, са посебним освртом на примену кортикостероида, антибиотика, сланих раствора за испирање носне шупљине и стандардизованих препарата лековитих биљака. Након тога, програм ће бити настављен слободним темама, чији ће број бити ограничен, а предност ће имати оригинални научни радови. Програм Симпозијума подразумева и електронске постер-презентације. Слободне теме и електронске постер-презентације ће обухватати све области ринологије: алергијски и неалергијски ринитис, акутни и хронични риносинуситис, носна полипоза, анатомске варијације носне шупљине/параназалних синуса, бенигне и малигне болести носа/параназалних синуса, ендоскопска синусна хирургија, септопластика, ринопластика, хирургија носних шкољки.

Симпозијум је акредитован у Здравственом савету Србије као Национални симпозијум са међународним учешћем. У току је припрема сајта Ринолошко-алерголошке асоцијације Србије, преко које ће бити могуће регистровати се за учешће на овом скупу. Очекује се да ће сајт бити у функцији пре краја 2017. године. Заинтересовани се до тада могу пријављивати преко званичне e-mail адресе Ринолошко-алерголошке асоцијације Србије: rinoaktiv@gmail.com

Доц. др Александар Перић

Председник Ринолошко-алерголошког актива Секције за Оториноларингологију Српског лекарског друштва

Gotovi lekovi: Priručnik za farmakoterapiju . XV izdanje.

Approved drugs: The manual for pharmacotherapy. 15th ed.

Kažić T, Gojković Bukarica Lj, Dobrić S, Tasić N,
Radulović S, Mitrović M, Đokić V.

Beograd: Integra, 2016: 1073.

ISBN 978-86-87907-17-1.

UDK 615.2(083.81).

COBISS.SR-ID 224403468.

Kazic T, Gojkovic Bukarica Lj, Dobric S, Tasic N,
Radulovic S, Mitrovic M, Djokić V.

Belgrade: Integra, 2016: 1073.

ISBN 978-86-87907-17-1.

UDK 615.2(083.81).

COBISS.SR-ID 224403468.

Medicinska edukacija je proces koji se stalno unapređuje i razvija a brojni udžbenici i priručnici prof. dr Tomislava Kažića (1937-2011) godinama su omogućavali lekarima i studentima biomedicinskih disciplina da dolaze do najnovijih naučnih i praktičnih saznanja koja su neophodna za bolje i sigurnije lečenje. Pored prethodnih izdanja ove knjige, vredni još pomenuti bar četiri njegova najvrednija dela: Klinička farmakologija-farmakoterapija, Antibiotici za kliničku praksu, Kradiovaskularni lekovi i kapitalnu knjigu, Klinička kardiovaskularna farmakologija, čije je izlaženje pokrenuo i zajedno sa saradnicima, uređivao i mnoga poglavlja pisao. U ovom, 15. izdanju knjige „Gotovi lekovi“ tim farmakologa je zadržao i stil i entuzijazam koji je prisutan u prethodnim izdanjima. Urađene su, međutim, nužne dopune i izmene u spisku lekova koje su se u periodu od prethodnog izdanja dogodile.

Uvodne teme knjige ističu važnost randomiziranih kliničkih studija lekova u procenjivanju efikasnosti i bezbednosti lekova ali takođe ukazuju na neke seriozne probleme medicine zasnovane na dokazima. Lekari u praksi neredovno prihvataju preporuke raznih medicinskih profesionalnih udruženja iako bi one trebalo da stimulišu lekare „da brže prihvataju novine u terapiji i bolje leče svoje bolesnike“. Potencijalni konflikt interesa istraživača i komiteta za pisanje preopruga značajno remete poverenje lekara koji propisuju lekove. Bolesnicima nikad nije bilo lako, govorio je prof. Kažić, ali sada ni lekarima nije lako. Ovaj, uvodni deo knjige, takođe je uključio racionalnu terapiju, propisivanje lekova uopšte i u rizičnim grupama, neželjena dejstva i neželjene interakcije lekova. U sledećem delu, posvećenom farmakologiji terapijskih grupa, opisani su lekovi prema sistemima i organima, sledeći Anatomsko-hemijsku terapijsku klasifikaciju. Spisak preparata čini treći deo knjige i sadrži pojedinačne lekove sa opisom esencijalnih informacija o sastavu, dejstvu, indikaciji, doziranju, neželjenim dejstvima, kontraindikacijama, upozorenjima, pakovanju i paralelama.

Imajući u vidu kvalitet rukopisa koji je pripremio šestočlani tim farmakologa i činjenicu da su glavne opšte preporuke izvornih izdanja ostale intaktne knjiga će biti značajan vodič lekarima, farmaceutskim i ostalim biomedicinskim stručnjacima, ali i studentima medicine. „Gotovi lekovi“ će doprineti boljem poznavanju lekova i lekovitih preparata, a time omogućiti i bolju terapiju i izbegavanje pojave nekih štetnih efekata pri nepravilnoj upotrebi medikamenata.

Prof. dr Rajko Igić

Uputstvo autorima za pripremu rukopisa

Instructions for authors for the preparation of manuscripts

PONS Medicinski časopis objavljuje originalne rezultate eksperimentalnih i kliničkih istraživanja, preglede, stručne radove, prikaze slučajeva, razrade naučnih metoda, prikaze knjiga, izveštaje sa naučnih i stručnih skupova, novosti u ekonomici zdravstva, informatici i menadžmenta u zdravstvu, radove iz istorije medicine, analize društvenih aspekata zdravstvene zaštite, radove medicinske etike, pisma uredniku kao i druge prikladne sadržaje iz oblasti medicine i srodnih grana. Podneti rukopisi podležu prethodnoj oceni od strane nezavisnih recenzentata. PONS Medicinski časopis objavljuje radove napisane na srpskom ili engleskom jeziku.

Dostavljanje rukopisa i dalji postupak. Rukopisi se dostavljaju u papirnoj (tri primerka) i elektronskoj formi (CD, DVD) na adresu uredništva: ZAVOD ZA JAVNO ZDRAVLJE "POMORAVLJE" ČUPRIJA, 35230 ČUPRIJA, MIODRAGA NOVAKOVIĆA 78 sa naznakom "ZA PONS MEDICINSKI ČASOPIS". Rukopisi se podnose u elektronskoj formi putem ASEESTANT (SouthEast European Journals Production Assistant) pristupom na link <http://aseestant.ceon.rs/index.php/pomc/userasamoizuzetnonae-mail> adresu casopisa: redakcija@ponsjournal.info. Uz rad priložiti izjavu s potpisima svih autora da članak nije objavljivao, kao i da nije u toku razmatranje za njegovo objavljivanje. U slučaju aplikacije elektronskim putem izjavu sa potpisima skenirati u pdf ili jpg formatu i poslati zajedno sa rukopisom. Objavljeni radovi se ne honorarišu a podnet materijal se ne vraća autorima. Autorska prava intelektualne svojine publikovanih sadržaja se prenose na izdavača, pri čemu autori zadržavaju pravo nekomercijalnog korišćenja na fer način u naučno-stručne svrhe i to: edukacije, istraživanja, kritike i pregleda.

Kategorizacija rukopisa. Prema preporukama UNESCO-a, a shodno JUS/ISO propisima i Zakonu o standardizaciji, kategorizacija članaka koje se objavljuju u časopisima je sledeća: a) originalni naučni rad (sadrži rezultate izvornih istraživanja, informacije u radu moraju biti obrađene i izložene tako da se eksperimenti mogu ponoviti, a analize i zaključci, na kojima se rezultati zasnivaju, proveriti), b) predhodno sopštenje (sadrži naučne rezultate čiji karakter zahteva hitno objavljivanje, ali ne mora da omogućiti proveru i ponavljanje iznesenih rezultata), c) pregledni članak (predstavlja celovit pregled nekog problema na osnovu već publikovanog materijala koji je u pregledu sakupljen, analiziran i komentaran), d) stručni članak (predstavlja koristan prilog iz područja struke čija problematika nije vezana za izvorna istraživanja i primarno odnosi na proveru ili reprodukciju u svetlu poznatih istraživanja radi širenja znanja i prilagođavanja izvornih istraživanja potrebama nauke i prakse). Kategorizaciju podnetih rukopisa vrši glavni i odgovorni urednik.

Tehnička priprema. Rukopis se priprema na računaru u MS Office Word-u ili ekvivalentnom tekstualnom editoru. Format stranice je A4, sa svim marginama 2.5 cm. Koristiti font Times New Roman, veličina 12 ("points"), sa izborom tastature srpska latinica ili engleski ("keyboard language"), dvostruki prored ("double space"),

PONS Medical Journal publishes original results of experimental and clinical researches, examinations, specialized researches, case reports, elaborations of scientific methods, book reviews, reports of scientific and specialized meetings, the health economy news, health informatics and management, medical history researches, analyses of social aspects of health care, medical ethics researches, letter to the editor, together with other appropriate contents in medical domain and other related fields. Submitted manuscripts are peer-reviewed by independent expert reviewers. PONS Medical Journal publishes researches written in Serbian or English language.

Submission of manuscripts and further action. The manuscripts are submitted in paper form (three copies) and in electronic form (CD, DVD) at the editorial office address: INSTITUTE OF PUBLIC HEALTH "POMORAVLJE" CUPRIJA, 35230 CUPRIJA, 78 MIODRAGA NOVAKOVICA STREET, with a note "FOR PONS MEDICAL JOURNAL". Manuscripts are submitted electronically through the ASEESTANT (SouthEast European Journals Production Assistant) system approaching it by the link <http://aseestant.ceon.rs/index.php/pomc/user> and only exceptionally by e-mail address of the journal: redakcija@ponsjournal.info. With the article, you are due to contribute a statement with signatures of all the authors that the article was not published and that it is not being considered to be published elsewhere. In case of the electronic application, you are to scan the statement with the signatures in pdf or jpg format and send it along with the manuscript. Published papers are not a subject of paying and the submitted material is not returned to the authors. Intellectual Property Copyright of published contents is transferred to the publishers, whereby authors retain the rights of non-commercial fair use for scientific and technical purposes: education, research, criticism and review.

Categorization of the manuscript. According to the recommendations of UNESCO, and in accordance with JUS/ISO regulations and laws on standardization, categorization of articles published in journals is the following: a) the original scientific paper (includes results of original research, information in the papers must be elaborated and exposed so that the experiments can be repeated, and the analyses and conclusions, on which the results are based, can be checked), b) preliminary reports (includes scientific results whose character requires urgent publication, but does not have to allow checking and repeating of certain results), c) review article (represents a complete review of a certain problem on the basis of already published material that is collected, analyzed and commented in the review), d) professional article (represents a useful contribution from the field of the profession whose problem is not related to the original research and is primarily related to the review or play in the light of known research in order to spread knowledge and adaptation of original research needed by science and practice). The categorization of submitted manuscripts is done by the editor in chief.

Technical preparations. The manuscript is prepared on a PC in MS Office Word or similar text editor. The page format is A4 with all margins size 2.5 cm. Use font Times New Roman, size 12 ("points"), with Serbian Latin or English keyboard language, double space, justify, tabs (size) 1.27 cm. In the entire manuscript use the same style, for the separation and the display of content

obostrano ravnanje ("justify"), pasus 1.27 cm uvučen ("tabs"). U čitavom rukopisu koristiti jednobrazan stil, za razdvajanje i isticanje sadržaja koristiti se samo velika slova i/ili numeraciju bez korišćenja stilova kao što su "Bold", "Underline", "Italic". Pridržavati se pravila kucanja, iza znaka interpunkcije ostaviti jedno prazno mesto, a za veće praznine koristiti tabulator. U tabelama koristiti samo mrežu („grid“) bez upotrebe isprekidanih, punih ili duplih linija. Slike (fotografije i grafikoni) se pripremaju u odgovarajućem aplikativnom softveru (npr. MS Office Excell ili Adobe Photoshop), u crno-belom varijanti („grayscale“), u rezoluciji 300 dpi i konvertuju u format jpg, tiff ili bmp.

Struktura rukopisa. Podneti rukopis treba da bude pripremljen i strukturisan prema uputstvima Međunarodnog komiteta urednika medicinskih časopisa ("Uniform Requirements for Manuscripts Submitted to Biomedical Journals") a prema poslednjoj verziji uputstva objavljenoj na internet stranici www.icmje.org. Opšta struktura originalnog rukopisa sastoji se i sledećih delova: naslovna stranica, sažetak, uvod, metod, rezultati, diskusija, izjava o konfliktu interesa sa ili bez izjave zahvalnosti, literatura, tabele, slike, legende za slike i spisak skraćenica. Struktura ostalih radova prilagođava se vrsti sadržaja. Maksimalni ukupni obim rukopisa orijentaciono treba da bude sledeći: originalni rad 12-15 strana, pregledni članak 15-20 strana, stručni članak 10-12 strana, rad iz istorije medicine 8-10 strana, predhodno saopštenje 6-8 strana, izveštaj i novosti 2-4 strane, prikaz knjige i pismo uredniku 1-2 strane.

NASLOV. Naslovna stranica sadrži naslov rada, imena autora, institucije autora, kontakt adresa autora za korespondenciju, kratki naslov, broj reči, broj tabela i slika.

APSTRAKT. Sažetak treba da je strukturisan (cilj, metod, rezultati, zaključak), sadrži do 250 reči i najmanje 5 ključnih reči prema MESH odrednicama.

Za rukopise napisane na srpskom jeziku naslovnu stranicu i sažetak dostaviti i na engleskom jeziku.

UVOD. U uvodu originalnih radova naznačiti značaj problema koji se ispituje, teorijske osnove na kojima je zasnovano istraživanje i ciljeve studije.

METOD. U delu ispitanici i metod/materijal i metod opisati opšti dizajn istraživanja, mesto i vreme istraživanja, studijsku populaciju/uzorak, načine objektivizacije praćenih ishoda i tehničke informacije, etičke aspekte i statističku analizu.

REZULTATI. Rezultate strukturisati shodno logičnom toku istraživanja. Navesti najznačajnije karakteristike studijske populacije ili uzorka, priložiti precizne i što detaljnije podatke sa merama centralne tendencije (aritmetička sredina, mod, medijana) i varijabiliteta (standardna devijacija, standardna greška, interval poverenja), shodno njihovom tipu i prirodi. U rezultatima ne ponavljati podatke koji su već prezentovani u prilogima (tabele i slike).

DISKUSIJA. U delu diskusija prezentovati najznačajnije zaključke studije u svetlu dosadašnjih saznanja, naznačiti moguća metodološka i druga ograničenja i dati završni zaključak uzimajući u obzir uži i širi naučno-stručni okvir.

LITERATURA. Vrsta i broj referenci se prilagođavaju tipu

use only capital letters and / or numbering without using styles such as "Bold", "Underline", "Italic". Stick to the rules of typing, after the punctuation mark leave a space, and for larger gaps use the tab. In the tables use only the web ("grid") without the use of punctuated, full or double lines. Images (photos and charts) are prepared in the appropriate applicative software (e.g. MS Office Excel, or Adobe Photoshop), in black and white versions ("grayscale"), resolution of 300 dpi and converted to JPG, TIFF or BMP.

The structure of the manuscript. Submitted manuscript should be prepared and structured according to the guidelines of the International Committee of Medical Journal editors ("Uniform Requirements for Manuscripts Submitted to Biomedical Journals") according to the latest version of the instructions published on the website www.icmje.org. The general structure of the original manuscripts consists of the following components: title page, abstract, introduction, method, results, discussion, statements about the conflict of interest with or without a statement of acknowledgement, bibliography, tables, figures, figure legends and a list of abbreviations. The structure of the other papers is tailored to the type of content. The maximum total volume of manuscripts should be approximately as follows: the original work of 12-15 pages, review article 15-20 pages, professional papers 10-12 pages, the work history of medicine from 8-10 pages, previous statements 6-8 pages, reports and news 2-4 pages, book reviews and letters to the editor 1-2 pages.

TITLE. Home page contains the title of the paper, author names, institutions of the authors, contact address for correspondence author, a short title, word count, a number of tables and images.

ABSTRACT. Abstract should be structured (objective, method, results and conclusion), contains up to 250 words and at least 5 keywords according to the MESH headings. For the manuscripts written in Serbian language title page and abstract should be submitted also in English.

INTRODUCTION. In the introduction of the original papers indicate the importance of the problems that are examined, the theoretical foundations on which the research and study goals are based.

METHOD. In subjects and methods / materials and methods describe the general design of the research, place and time of the research, study population / sample, ways of objectively tracked outcomes and technical information, ethical aspects and statistical analysis.

RESULTS. Structure the results according to the logical course of the research. Indicate the most important characteristics of the study population or sample, submit accurate and detailed information with the measures of the central tendency (arithmetic mean, mode, median) and variability (standard deviation, standard error, confidence interval), according to their type and nature. In the results do not repeat information already presented in the attachments (tables and figures).

DISCUSSION. In the discussion part present the most important conclusions of the study in the light of previous findings, indicate possible methodological and other limitations and give a final conclusion, taking into account a narrower and broader scientific framework.

REFERENCES. The type and number of references are adapted to the type and structure of the manuscript. Generally, you should

i strukturi rukopisa. Uopšte uzev, treba da se koristi najmanji mogući broj citata a prednost u navodjenju treba da imaju radovi publikovani u celini, po mogućstvu u što renomiranijim časopisima sa recenzijom. Knjige, monografije i sadržaje publikovane na internetu koristiti izuzetno. Ukoliko nije neophodno izbegavati navodjenje radova u štampi („in press“), radova publikovanih u sažetoj formi („abstracts“), nepublikovane rezultate („unpublished observations“), informacije ličnih kontakata („personal communication“). U tekstu, literatura se citira arapskim bojovima u superskriptu, iza znaka interpunkcije, prema redosledu pojavljivanja. U spisku literature reference se označavaju odgovarajućim brojevima i sortiraju u rastućem redosledu. Navodi se do šest autora a ukoliko ih je više onda se navode prva tri uz dodatak „et al.“ ili „i ost.“. Reference se navode na srpskom ili engleskom jeziku, a u ostalim slučajevima (sem citata na grčkom i latinskom) naslovi se prevode na engleski, sa naznakom izvornog jezika u uglastoj zagradi. Nazive časopisa navoditi u skraćenoj formi prema MEDLINE bazi podataka. Literaturu navoditi na osnovu sledećih primera:

o Connolly SJ, Ezekowitz MD, Yusuf S, et al. Dabigatran versus warfarin in patients with atrial fibrillation. *N Engl J Med* 2009; 361(12): 1139-51.

o McPhee SJ, Papadakis M. Current medical diagnosis and treatment 2009. 48th ed. New York: McGraw-Hill Professional, 2008.

o Mark DB. Decision making in clinical medicine. In: Fauci SA, Eugene Braunwald E, Kasper DL, et al., eds. *Harrison's principles of internal medicine*, 17th ed. New York: McGraw-Hill Professional, 2008: 16-23.

Za ostale tipove referenci konsultovati skorašnje sveske PONS Medicinskog časopisa ili odgovarajuće preporuke Nacionalne biblioteke za medicinu (NLM).

PRILOZI. Tabele i slike citirati u tekstu na odgovarajućem mestu u zagradi i podneti ih i numerisati na odgovarajući način arapskim brojevima, prema redosledu pojavljivanja. Iznad tabele postaviti naslov a ispod dodatne informacije korišćenjem simbola po sledećem redosledu: *, †, ‡, §, ||, ¶, **, ††, ‡‡. Legende za slike treba da se dostave na posebnoj stranici. Za mere treba da se koristi Međunarodni sistem jedinica ("International System of Units"-SI) a u posebnim slučajevima alternativne jedinice shodno naučnoj disciplini i oblasti.

Reprint. Autori besplatno dobijaju po 10 primeraka reprinted publikovanog rada. U ostalim slučajevima, autori i druga zainteresovana lica treba da kontaktiraju izdavača putem adrese uredništva.

Napomena. Uredjivanje naučno-stručnih sadržaja časopisa je potpuno nezavisno. Odgovornost za tačnost prezentovanih informacija i originalnost autorskih sadržaja u sopstvenim radovima snose sami autori. Sva autorska prava publikovanih sadržaja preuzima vlasnik časopisa. Uz citiranje izvora, dozvoljeno je nekomercijalno korišćenje publikovanih sadržaja na fer način u naučno-stručne svrhe i to: edukacije, istraživanja, kritike i pregleda. Vlasnik, izdavači i saradnici PONS Medicinskog časopisa odriču svaku odgovornost za bilo kakvu štetu koja može da nastane korišćenjem bilo koje informacije publikovane u časopisu.

use the smallest possible number of citations and give priority to works published in extenso, preferably in the most ranked, reviewed journals. Books, monographs and Internet-published contents use in exceptional cases. If it is not necessary, avoid specifying the works in press, papers published in very concisely ("abstracts"), unpublished results (unpublished observations), personal contact information ("personal communication"). In the text, literature is cited in Arab numerals in superscript, after punctuation marks, in order of appearance. In the bibliography list, the references are marked with appropriate numbers and sorted in ascending order. Cite up to six authors and if there are more of them the first three are placed with the addition of "et al." or "I ost.". References are listed in Serbian or English, and in other cases (except for quotations in Greek and Latin) titles are translated into English, indicating the original language in square brackets. Cite names of journals in the shortened form according to the MEDLINE database. References lead to the following examples:

o Connolly SJ, Ezekowitz MD, Yusuf S, et al. Dabigatran versus warfarin in patients with atrial fibrillation. *N Engl J Med* 2009; 361(12): 1139-51.

o McPhee SJ, Papadakis M. Current medical diagnosis and treatment 2009. 48th ed. New York: McGraw-Hill Professional, 2008.

o Mark DB. Decision making in clinical medicine. In: Fauci SA, Eugene Braunwald E, Kasper DL, et al., eds. *Harrison's principles of internal medicine*, 17th ed. New York: McGraw-Hill Professional, 2008: 16-23.

For other types of references, consult recent issue of PONS Medical Journal or the relevant recommendations of the National Library of Medicine (NLM).

ATTACHMENTS. Tables and figures should be cited in the text in appropriate place in brackets and apply them appropriately numbered in Arabic numbers, in order of appearance. Above a table place a title and below an additional information using the symbols in the following order: *, †, ‡, §, ||, ¶, **, ††, ‡‡. Legends of the images should be submitted at a separate page. The measures should be used for the International System of Units (International System of Units-SI) in special cases, alternative units according to scientific discipline and field.

Reprint. Authors receive 10 free reprints copies of the published work. In other cases, authors and other interested parties should contact the publisher via the editorial office.

Additional Notes. Editorial management of the professional and scientific journal content is completely independent. Responsibility for the accuracy of the presented information and original copyright content in their own works bear the authors themselves. All copyrights of the published contents are taken over by the owner of the journal. With the citation of sources, non-commercial fair use for scientific and technical purposes is allowed: education, research, criticism and review. The owner, publishers and associates of PONS Medical Journal disclaim any responsibility for any damage that may occur using any information published in the journal.

CIP - Katalogizacija u publikaciji
Narodna biblioteka Srbije, Beograd,
UDK 61

Štampano izdanje / Print issue: ISSN 1820- 2411
Online : ISSN 2406- 1352
COBISS.SR/ID 115713804

Izlazi polugodišnje, nulti broj izašao 3. Juna 2004.
Issued semiannually, the no.0 came 3rd June 2004.

Tiraž 200 primeraka



MEDICINSKI ČASOPIS
PONS
MEDICAL JOURNAL

WWW.PONSJOURNAL.INFO