

Stomatološka edukacija levorukih studenata

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Dental education of Left-handed students

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KRATAK SADRŽAJ

Uvod: Asimetrična aktivnost moždanih hemisfera se projektuje putem lateralnosti, tj. dominacijom jednog od parnih organa. Posebno značajan vid ispoljavanja lateralnosti je levorukost. Levoruki moraju da rešavaju razne konflikte sa okolinom, tako da slabo izražena levorukost obično u ranoj mladosti prelazi u izraženu desnorukost, na sreću bez poteškoća. **Cilj** ovog rada je bio da se utvrdi broj i distribucija levorukih studenata stomatologije, provere mogućnosti i predlože mere za prevazilaženje problema u njihovoj edukaciji. **Materijal i metod:** Istraživanja su obavljena na Klinici za bolesti zuba Stomatološkog fakulteta Univerziteta u Beogradu. Anketirano je ukupno 1385 pojedinaca u šest generacija završnih godina studija, na vežbama iz predmeta Bolesti zuba pretklinika i klinika. **Rezultati:** Ustanovljeno je da od ukupnog broja ispitanika 62 (4.48%) pripadaju levoruko orijentisanoj populaciji. Analizom je utvrđeno da su dobijene vrednosti relativno homogene i skoncentrisane u uskom opsegu od 4- 6 % ispitivanog uzorka. **Zaključak:** Kako je procenat levorukih mali, neophodno je promeniti odnos prema levorukim studentima stomatologije i omogućiti ovoj grupaciji da se pravilno razvija i usmerava.

Ključne reči: levorukost, stomatologija, edukacija ,praktičan rad.

SUMMARY

Introduction: Asymmetrical activity of brain hemispheres is projected through laterality e.g the dominance of one of the paired organs. A very important way of laterality manifestation is left-handedness. The left-handed must solve various conflicts with their environment, so mild left-handedness usually shifts into dominant right-handedness in the early childhood, fortunately with no difficulties. **Aim:** The purpose of this study was to determine the number and distribution of left-handed dental students, check the possibilities and propose measures for solving the problem in their education. **Material and methods:** The study was conducted at Belgrade University School of Dentistry, dept. of restorative dentistry and endodontics. During two academic years, six generations of senior dental students (III, IV and V year students) completed a questionnaire, i.e 1385 individuals were included in the survey. **Results:** The questionnaire revealed that out of the total number of students involved in the study 62 (4.48%) students were left-handed. The distribution of left-handed students is relatively uniform and concentrated between 4-6% of the sample. **Conclusion:** Even though the number of left-handed students is small, it is necessary to change conditions for their education and enable their proper development.

Keywords: left-handedness, dentistry, education, practical work

Asimetrična aktivnost moždanih hemisfera se projektuje putem lateralnosti, tj. dominacijom jednog od parnih organa. Levorukost ili desnorukost je karakterističan primer lateralnosti i ne može se smatrati prihvatljivom ili lošom navikom, jer je u stvari prirodna manifestacija dominacije određene hemisfere mozga. Dominacija je osobina jedne od hemisfera mozga da uprevlja razvojno najvišim radnjama čoveka. To je u osnovi duboko biološka pojava jer je urođena i nasledna.(1) U neurofizi-

Asymmetrical activity of brain hemispheres is projected through laterality, that is, domination of one pair of organs. Left-handedness or right-handedness is a characteristic example of laterality and it can't be considered as excepted or bad habit, because it is natural manifestation of particular brain hemisphere domination. Domination is a characteristic of one brain hemisphere to operate the highest development actions of a man. That is a deeply biological phenomenon because it is hereditary and innate.(1) In neurophysiology, but in cybernetics, too, at pair organs,

ologiji ali i u kibernetici, kod parnih organa koji su do tada mogli da rade paralelno, u najsloženijim situacijama, automatski dolazi do dominacije jedne polovine sa vodećom, dirigujućom ulogom. (1) Lateralnost se kod različitih ljudi različito i ispoljava. Kreće se od izrazite desnorukosti ili levorukosti do sasvim neznatnih razlika u dominaciji jedne od ruku. Bez obzira što je lateralizacija čisto biološka kategorija, njena manifestacija je proizvod bioloških i društvenih faktora. Broj rođenih levorukih je podjednak onima sa dominantnom desnom rukom.¹ Tokom života se taj odnos drastično menja. Posebno u tradicionalnim društvenim zajednicama.

Današnji svet je, pored svih promena, ipak svet desnorukih. Na ovom principu još uvek funkcioniše deo tehničko-tehnološke kulture. Rezultat toga stava je da se desnoruki u svom razvoju ne sreću sa teškoćama koje čekaju levoruke. Naime, levoruki moraju da rešavaju razne konflikte sa okolinom, tako da slabo izražena levorukost obično u ranoj mladosti prelazi u izraženu desnorukost, na sreću bez poteškoća. Već kod srednjeg stepena levorukosti, pri prelazu na desnorukost, može doći do otvorenog ili skrivenog oštećenje individue. (1) Levoruki sa jako izraženim stepenom dominacije nisu sposobni za konverziju dominantne hemisfere bez karakternog i intelektualnog oštećenja. (1) Prethodne činjenice su determinisale temu ovih istraživanja. Naime, predmet interesovanja u ovom radu su bili levoruki studenti osnovnih studija stomatologije i način njihovog školovanja kroz praktičan rad na obavezanim vežbama.

Kao što je poznato studije stomatologije su dugotrajne i naporne. (2) Traju deset do dvanaest semestara i zahtevaju veliko fizičko angažovanje. Na Stomatološkom fakultetu Univerziteta u Beogradu u petom semestru počinju ozbiljne muke levorukih, jer je kompletna koncepcija radnog mesta planirana za desnoruke. (2)

Medjutim, današnji nivo tehnološkog razvoja sasvim sigurno omogućava koncept radnog mesta za obe grupe studenata (desnoruke i levoruke) pod istim uslovima. U ovim činjenicama su generisani parametri za formiranje kvalitetnog stomatologa, ali i mogućnost za stvaranje velikih, ponekad nepremostivih problema sa nesagledivim psiho-fizičkim posledicama.

Cilj ovog rada je bio da se utvrdi stanje, broj i distribucija po godinama studija levorukih studenata stomatologije, provere mogućnosti i predlože mere za prevazilaženje problema u njihovoj edukaciji.

Materijal i metod

Istraživanja su obavljena na Klinici za bolesti zuba Stomatološkog fakulteta Univerziteta u Beogradu. Anketirano je ukupno 1385 pojedinaca u okviru dve školske

which could work, parallel till then, in the most complex situations, automatically lead to domination of one half with a leading, conductive role. (1) Laterality is differently demonstrated at different people. It ranges from outstanding right-handedness or left-handedness to the slight differences in one or another hand domination. No matter that laterality is clearly biological category; its manifestation is a product of biological and social factors. The number of left-handedly born people is the same as those with right-hand domination. During the life that relation drastically changes, especially in a traditional social communities.

Contemporary world stays, besides all the changes, the right-handed world. According to this principle the world of technology is functioning. The result of this attitude, the right-handed people don't have the difficulties as the left-handed. Namely, the left-handed have to solve different conflicts with their surroundings, so that weakly expressed the left-handedness usually in an early youth grown into predominant right-handedness, fortunately with no difficulties. But, at the middle level of the left-handedness when crossing to right-handedness, there could happen an open or covered "individual damage". The left-handed with strongly expressed level of domination are incapable of conversion of dominant hemisphere without character or intellectual damages. (1)

The previous facts determined the theme of those researches. Namely, the aim of interest in this work is the left-handed students of dentistry and their way of education through the practical work on their obligatory practice.

As it is known the dentistry studies are long lasting and strenuous. (2) They last for ten or twelve terms and involve great physical engagement. At the College of Dentistry of Belgrade University the serious problems of the left-handed students start on the fifth term, because, the whole conception of the working place is made for the right-handed.

However, modern level of technology development is clearly enables the concept of the working place for both groups of the students (the right-handed and the left-handed) under the same conditions. In those facts there are generated parameters for shaping the qualitative dentist, and also the possibilities for creating a big, sometimes insurmountable problems with unforeseeable psychophysical consequences.

The aim of this work is to establish the situation, the number and distribution according to the college year of the left-handed dentistry students, to check the possibilities and to propose the measures for overcoming the problems in their education.

Material and methods

The researches were done in the Clinic for conservative dentistry and endodontic at the College of Dentistry of Belgrade University. 1385 students took place in the poll conducted during the two school years, and the three gen-

godine, u po tri generacije završnih godina studija, koje su vežbale predmet Bolesti zuba pretklinika i klinika.

eration of the last year of study, who practised the subject "Tooth diseases – pre-clinic and clinic".

Rezultati

Dobijeni rezultati prikazani su u tabelama 1 i 2 i grafikonima 1 i 2.

Results

The results achieved are shown in the tables 1 and 2, and in graphics 1 and 2.

Tabela 1. Broj i distribucija levorukih studenata u tri generacije u školskoj 2003/4 godini:

Table 1. Number and distribution of left-handed students in three generations in academic year 2003/2004.

Grupe	br. Stud.	Levoruki	%
III godina	178	10	5,62 %
IV godina	204	5	2,45 %
V godina	236	14	5,93 %
Svega	613	29	4,73 %

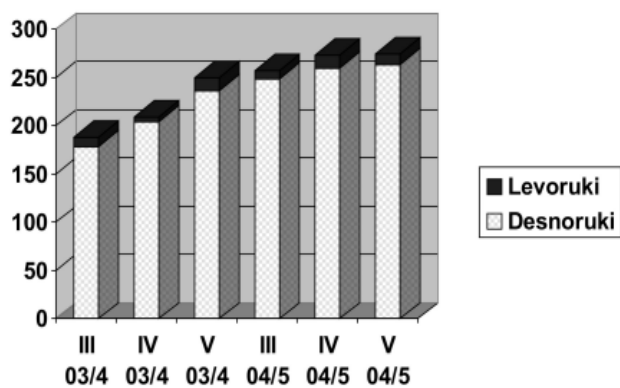
Tabela 2. Broj i distribucija levorukih studenata u tri generacije u školskoj 2004/2005 godini:

Table 2. Number and distribution of left-handed students in three generations in academic year 2004//2005.

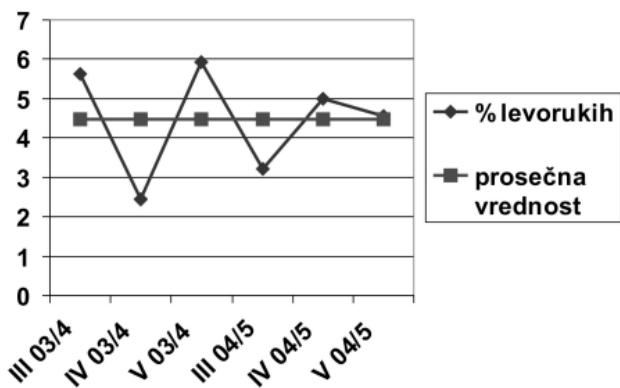
Grupe	br. Stud.	Levoruki	%
III godina	249	8	3,21 %
IV godina	260	13	5,00 %
V godina	263	12	4,56 %
Svega	772	33	4,27 %

Ustanovljeno je da od ukupnog broja ispitanika (1385) 62 pripadaju levoruko orijentisanoj populaciji, što iznosi 4,48 procenata. Distribucija po generacijskim grupama je predstavljena grafikonom 1.

It is established that, from the total number of tested students (1385) 62 of them belonged to the left-handed population, which is 4.48 %. The distribution according to their generation groups is presented in graphic 1.



Grafikon 1. Distribucija levorukih studenata stomatologije po generacijskim grupama
Graph 1. The distribution of left-handed dental students in generations



Grafikon 2. Disperzija levorukih studenata po generacijskim grupama u odnosu na prosečnu vrednost ispitivanog uzorka
Graph 2. Dispersion of left-handed dental students in generations in relation to the average number of the analyzed sample

Tabele 1 i 2 generišu dobijene podatke i determinišu karakter uzorka. Njihovom analizom utvrđeno je da su dobijene vrednosti relativno homogene i skoncentrisane u uskom opsegu od 4- 6 % ispitivanog uzorka. Granične maksimalne vrednosti, što može dodatno da komplikuje rešavanje problema, neznatno su iznad proseka i ne prelaze 6 %.(grafikon2) U ovakvoj vrsti analize važno je da se sagledaju i maksimalne pojedinačne vrednosti po godini studija. Najviša utvrđena cifra je 14 studenata.

Diskusija

Stomatološka edukacija je vrlo značajan segment medicinskog obrazovanja, a jedan od problema u njenoj realizaciji je levorukost.

Brojni stručni radovi ukazuju da se u procesu edukacije i profesionalnog angažmana moraju poštovati biološka prava pojedinca i da se prirodna opredeljenja ličnosti ne smeju nasilno menjati. (3-5)

Sovak i sar. su na uzorku od 134 preorijentisane levoruke individue konstatovali čak 17 vrsta poremećaja. Ti poremećaji su se kretali od motoričkog nemira (55,5%), promena u ponašanju (50,2%), poteškoća u pisanju desnom rukom, neuroza, mucanja, otpora prema školi, pogoršanja uspeha, kolebanja u uspehu, disleksije, disgrafije, kolebanja u pažnji, nespretnosti, poteškoća u pisanju levom rukom do enureze, tika, epilepsije i razročnosti. Istraživanja su rađena na grupi dece predškolskog i školskog uzrasta. Veoma je zanimljivo autorovo zapažanje da, kad se gleda individualno, najmanje poremećaja ima u predškolskom uzrastu (po jednom detetu dolazi svega 2,8% promena), dok se taj broj drastično povećava za školski uzrast (5,2 poremećaja po osobi).(1)

Posledice preorijentacije se ispoljavaju kod dece u motoričkoj i govornoj oblasti, intelektualnom razvoju i karakteru.(6)

Naravno i studenti koji se opredele za studiranje stomatologije imaju pravo na različitost jer se osporavanje obično vraća kao bumerang sa kumulativnim efekatom, i to u godinama kada su oni već uveliko prepoznatljive ličnosti sa svojom kompletno formiranom motorikom.

Danas, međjutim, u većini visokoškolskih ustanova, taj problem uglavnom ne postoji. Zanimljiva je ipak polemika koja se razvila na inicijativu R. Graham-a u British Dental Journal-u.(7-9) Niko od učesnika u toj polemici ne negira potrebu afirmacije levorukih stomatologa, ali neki od njih, sasvim opravdano, postavljaju praktično pitanje o daljoj profesionalnoj sudbini levoruko edukovanih stomatologa u svetu dominantno desnoruko koncipirane stomatološke prakse.

Neka ustaljena i prevaziđena pravila se moraju menjati jer je nesporno da se najbolji rezultati postižu kada postoji ambijent u kome je moguće slobodno razvijanje prirodnih sposobnosti bez nasilnog nametanja krutih,

Tables 1 and 2 are generating received information and determine the character of the sample. It is established, by analysing them that the received values are relatively homogenous and concentrated in the narrow scope of 4-6% of tested sample. The maximal border values, that could additionally complicate the solution of the problem, are slightly above the average and they don't go over 6% (graphic 2). In this kind of analyses the important thing is to observe maximal individual values according to the academic year. The highest estimated number was 14 students.

Discussion

Dentist education is very important segment of medical education, and one of the problems in its realisation is left-handedness.

The numerous expert works show that in the process of education and professional engagement have to be respected the individual biological rights and that the natural personal choices mustn't be changed by force.(3-5)

Sovak and associates concluded from the sample of 134 re-oriented left hands, even 17 kinds of disorders. Those disorder were from mobility disturbance (55.5%) to, behaviour changes (50.2%), difficulties in writing, neuroses, stammer, resistance to school, decrease of the marks, hesitation in a success, dyslexia, disgraphy, hesitation in the attention, clumsiness, difficulties in left hand writing to enuresis, tic, epilepsy and squint. The researches were done in a group of pre-school and school children. The very interesting thing is the author's observation than, when watching individually, the least disorders were noticed in pre-school age (there was 2.8% of changes per a child), while the number was drastically growing with school age children (5.2% disorders per a child). (1)

The consequences are demonstrating in children's mobility and speech skills, intellectual development and character.

Students who choose to study Dentistry have their right to be different, because the denial is usually has a boomerang cumulative effect, and it happens in the age when they are complete persons with formed mobility.

Nowadays, however, in the most of High education institutions, that problem doesn't exist. The interesting is a polemic that was developed on the initiative of R. Graham in the British Dental Journal.(7-9) No one a the polemic doesn't deny the need to affirm the left-handed dentists, but some of them, understandably, ask the practical questions about the further professional destiny of the left-handed dentists in the world of dominate right-handedly conceived dental practice.

Some of the usual and exceeded rules have to be changed, for it is clear that the best results are made when there is an ambient in which the development of the natu-

štetnih i prevaziđenih normi.(6) Drugo, važno pitanje je da li se i kako to može ostvariti na praktičnim vežbama studenata stomatologije.

Letimična analiza pokazuje da se već sada može na pretkliničkim vežbama, u zatečenim uslovima, bez većih dodatnih ulaganja, obaviti kvalitetna obuka levorukih studenata. Ne izvodi se, jer je beskorisna zbog situacije na kliničkim vežbama. Tamo tih uslova još uvek nema, i zato se ova tzv. « šok terapija promene ruke (da li samo to?) » odvija u pretkliničkim uslovima, da bi se pre rada u kliničkim uslovima na pacijentima, kod ovih mladih ljudi uspostavile neke nove relacije. O efektima edukacije i rada u ovakvim uslovima i posledicama koje proizvode mora se ozbiljnije razmišljati i svakako argumentovano govoriti. To je način da se problemi reše, jer po tvrdnjama istraživača neoreorijentisana i vaspitno stimulisana levoruka individua je povoljniji tip od desnoruke.^{1,6} Najmanje povoljan tip je reorijentisana levoruka individua. Postoje tvrdnje da su najveći geniji čovečanstva, bili neoreorijentisani levoruki. Za Leonarda da Vinčija postoje dokazi da je bio univerzalac koji se podjednako služio obema rukama i u tome nije bio sputavan. (10)

Iako su radna mesta prilagođena desnorukim, postoji mogućnost njihove adaptacije potrebama levorukih studenata, kasnije stomatologa. Za razvijeni svet - čist tehnički problem, doduše, skopčan sa nešto finansijskog ulaganja. Stav je promenjen i u našem društvu, tako da učenici sve do upisa pojedinih fakulteta, znači u nižem i srednjem obrazovanju, mogu da se opredeljuju po biološkim principima sopstvenog bića. Kada tome dodamo samo letimičan pogled na ergonomsku i antropometrijska ispitivanja koja se ozbiljno sprovode, radi preciznog definisanja zahteva, pre svih arhitekta, ali i ostalim strukama da se životni i radni prostor prilagodi individualnim potrebama korisnika, apsurd u kome se krećemo i na kome istrajavamo je još veći. (3,11)

U analiziranom skupu velikih brojeva, bar što se tiče studija stomatologije, broj od 14 levorukih studenata po jednoj generaciji ne predstavlja nerešivu prepreku. Incident sa naglim skokom broja levorukih u nekoj od sledećih studentskih generacija uvek ostaje kao mogućnost, jer prezentovani podaci pružaju realne mogućnosti u planiranju praktične nastave. Tim pre jer je praktičan rad tokom studija jedan od osnovnih postulata bolonjskog procesa, na kome dosledno istrajava kompletna evropska univerzitetska javnost. (12-14)

Problem je jednostavan i rešiv, ali za to je pre svega potrebna svest o njegovom postojanju i čvrsta odluka da se to može i mora rešiti. Ako se u tom domenu otklone sve dileme, ostalo je zaista stvar tehnike i nešto finansijskog ulaganja. Proizvođači opreme već imaju gotove programe, gde se u rekordno kratkom vremenskom roku radna mesta mogu prilagoditi desnorukim, odnosno levorukim studentima. Takvi uslovi se mogu replicirati i u svakodnevnom profesionalnom angažmanu.

ral abilities is possible, without unwilling imposition of severe, harmful and exceeded standards. (6)

The other important question is how and if it is possible to achieve it in dentistry students' practice sessions.

Rough analyse shows that even now, on the pre clinical practice sessions, and without additional investments, the qualitative training of left-handed student could be done. It is not carried out for it is useless because of the situation on the clinical sessions. There no such conditions, and therefore this, so to say "shock therapy of hand change (if it is the only thing that happens)", takes place in pre-clinical conditions, so that before work in clinical conditions on patients, this young people can establish some new relations. The educational effects in those conditions and consequences they produce have to be seriously considered and argumentatively discussed. That is the way to solve the problems, for according to the researchers' statements, un- pre oriented and educationally stimulated left-handed individual is more favourable person than the right-handed one. 1,6 The least favourable type is pre oriented left-handed individual. There are claims that the greatest geniuses of the mankind were un- pre oriented left-handed people. There are proofs that Leonard Da Vinci was universal man who used his both hands with the same skill and he wasn't restricted. (10)

Although, the working places are adapted for the right-handed students there are way of their adaptation for the left-handed students, later dentists. For the developed countries - it is merely technical problem, connected with the financial investment. The attitude is changed in our country, so that the pupils until their enrolment to the University, which means in pre and elementary schools, could decide according to the principles of their own biological being. Superficial look to ergonomic and anthropometrical researches which are seriously conducted, for the precise definition of the demands, especially for the architects, and than for all other professions the their life and working place should be adopted to their needs, the absurd we are keeping and hanging on is bigger. (3,11)

In analysing the set of large numbers, at least in the Dentistry study, the number of 14 left-handed students per a generation is still the possibility, because the presented data give the real possibility for planning the practical sessions. In the end, practical work during the study is one of the base postulates of Bologna process, on which the whole European University public is very persistent. (12-14)

The problem is simple and solvable, but above all, the sense of its existence is suppose to exist, and the strong decision that here is and must be a solution. If the dilemmas are solved in that domain, the other is technical and financial matter. The producers of the equipment have already had finished programs, when in a very short time the working places could be adopted to the right-handed or left-handed students. Those conditions could be replicated in everyday professional engagement.

Zaključak

Analiza dobijenih rezultata pokazuje da problem u edukaciji levorukih studenata postoji i da su navedeni razlozi opravdani i dovoljni da se postojeći odnos prema levorukim studentima stomatologije promeni i obezbede za njih optimalni uslovi. Ona proizilazi iz tvrdnje psihologa da je najpovoljniji tip lateralnosti levorukost, pod uslovom da je prirodna. Sprovedena istraživanja sadrže argumente koji se ne mogu zanemarivati, posebno ako postoji spremnost da stvari menjamo na bolje, uz odlučnost da u te promene uključimo sebe zbog dobrobiti drugih.

Conclusion

The analyse of the results achieved show that the problem in left-handed students education exists, and that the induced statements are justified and enough to change the existing relation towards the left-handed students of Dentistry, and to provide better conditions of work for them. It originated from the psychologies statement the best type of laterality is left-handedness, under conditions that it is natural. The conducted researches contains the arguments which couldn't be neglected, especially if there is readiness to change the things for the better, with the decisiveness to include ourselves in those changes for the best of the others.

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