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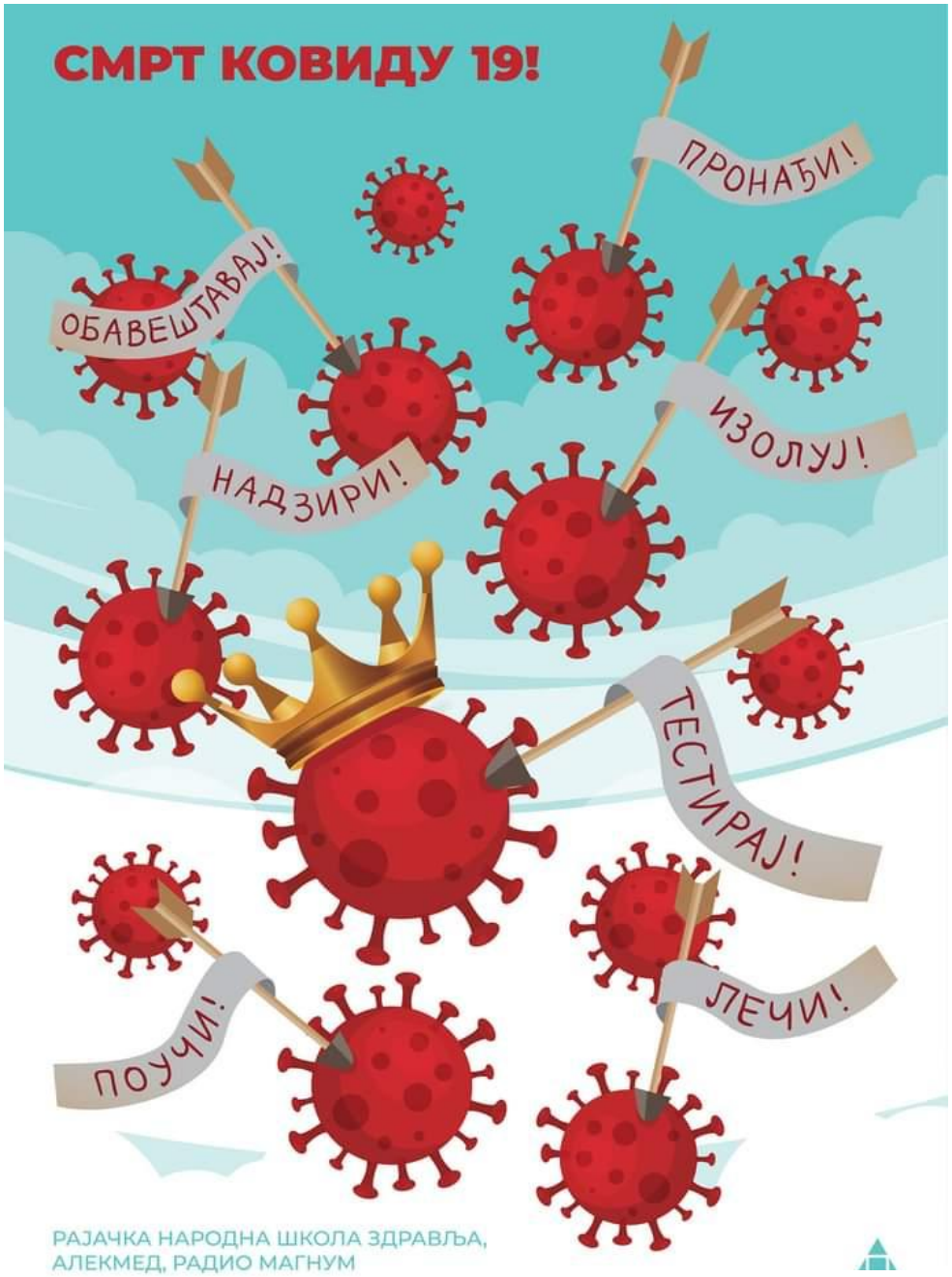

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TIMOČKI MEDICINSKI GLASNIK

REČ GLAVNOG UREDNIKA ČASOPISA TIMOČKI MEDICINSKI GLASNIK
A WORD FROM THE EDITOR-IN-CHIEF OF THE TIMOK MEDICAL GAZETTE

Naslovna strana je zdravstveni poster autora Prim Dr Sci Petra Paunovića i Pauline Aleksić. On je lep naučni i stručni sažetak sveobuhvatnog pristupa pandemiji infekcijom virusa korona SARS-COVID19. „Priča o korona virusu - Zdravstvene pouke" je **Prva knjiga** u Srbiji o korona epidemiji, koju je objavio, u ediciji Rajačka narodna škola zdravlja juna 2020, naš eminentni medicinski stručnjak Prim. Dr sci. Dr med. Petar Paunović, učitelj zdravlja, specijalista epidemiologije, socijalne medicine i zdravstvenog vaspitanja, neumorni borac za zdravstveno vaspitanje i prosvećivanje naroda.

Glavni urednik/Editor in chief Prim Dr Sc Dušan Bastać

REČ AUTORA PRIM. DR SCI. DR MED. PETAR PAUNOVIĆ, UČITELJA ZDRAVLJA

U „Priručniku o prevenciji i lečenju KOVID 19 infekcije", a Priručnik je napisan na osnovu kliničkog iskustva Liang Tingo-a, napisano je sledeće: „*Nalazimo se u globalnom ratu bez presedana! Čovečanstvo se suočava sa zajedničkim neprijateljem, novim korona virusom. Prvo bojno polje su upravo bolnice, gde su vojnici naši zdravstveni radnici. Da bi obezbedili pobedu u ovom ratu, moramo najpre da budemo sigurni da naše medicinsko osoblje ima dovoljno resursa, uključujući iskustvo i tehnologiju. Takođe, moramo da stvorimo uslove da bolnice budu bojno polje na kome ćemo eliminisati virus, umesto da virus pobedi nas. Ovaj rat je tek počeo*". U našu zemlju su došli kineski lekari. U sastavu njihove ekipe nije bilo epidemiologa. Iz prethodnih reči Liang-a se vidi strategija borbe sa KOVID-om u Srbiji 2020. godine. Ta strategija je primenjivana do kraja. Naša epidemiološka doktrina je bila izostavljena. Naša preventiva skoncentrisana u Istitutima i Zavodima za javno zdravlje zbog toga je imala sporednu ulogu u suzbijanju epidemije korona virusa u Srbiji. Ionako potpuno destruirana tokom poslednje dve decenije, ona je pretrpela još jedan udar od kojeg će se teško oporaviti.

U Rajcu, juna 2020. godine, Dr Petar Paunović, učitelj zdravlja

Iz predgovora Dr Sci Dr med Aleksandra Aleksića interniste - endokrinologa iznosimo najvažnije činjenice: Rukopis: „Priča o korona virusu - Zdravstvene pouke" napisan je u periodu od 3. marta do 20. maja 2020. godine, u vreme epidemije KOVID-a 19 u Srbiji i predstavlja neku vrstu dnevnika epidemije korona virusa u Srbiji, jer su zdravstvene pouke pisane svakodnevno, inspirisane epidemiološkim pojavama i merama, koje su preduzimane u borbi protiv epidemije.

U rukopisu postoji sedam poglavlja sačinjenih od niza priča koje opisuju virus i njegove osobine, kao i pouke o ponašanju u vreme epidemije korona virusa i merama koje treba preduzeti u cilju zaštite u svakodnevici. U pomenutom rukopisu nalazi se četrdesetak autorskih članaka o korona virusu i epidemiji KOVID-a 19 u Srbiji.

U jednom trenutku, suočen sa oklevanjem u primeni epidemioloških mera u prekidanju Vogralikovog lanca i korišćenja matematičkih modela u planiranju i vođenju borbe protiv KOVIDA-a 19, tj. u sučeljavanju epidemiološke teorije i realne situacije na terenu, autor piše izvestan broj pamfleta koji predstavljaju kritiku medicinske prakse na terenu u suzbijanju epidemije KOVID-a 19 u Srbiji.

U rukopisu pored ostalog, postoje članci o aktivnosti Svetske zdravstvene organizacije, koja je služila kao referentna institucija autoru. Kao izvor referenci i literature autor je još koristio: „Priručnik o prevenciji i suzbijanju KOVID 19 infekcije", kineskog autora Liang Tingo-a, udžbenike epidemiologije prof. dr Zorana Radovanovića i Zbornik radova Epidemiološkog insituta Medicinskog fakulteta u Beogradu. U pomenutom smislu, autor je koristio i časopise iz Francuske i Kanade: La sante publik, La sante publik d Kanada i listove: L figaro, L Parizjen. Zdravstvene pouke i druge članke u ovom rukopisu autor je slao na 30-ak mejl adresa, na portale Radio Magnuma, „Timočka" i „Tina", odmah posle pisanja, tako da ih je građanstvo moglo odmah čitati. Imajuću u vidu sve što je pomenuto, kao i povod za pisanje ovog rukopisa, te okolnosti u kojima je pisan, predlažem da obavezno i neizostavno pročitate ovaj tekst i priču širite i prenosite dalje.

Dr Aleksandar Aleksić iz Štipine

C O N T E N T S

ORIGINAL PAPERS

Slađana Pavić, Milica Jovanović, Miloš Božović, Aleksandra Pavić
ACUTE BACTERIAL MENINGITIS IN THE ZLATIBOR DISTRICT 91

Enes Slatina, Mirza Ibrahimpašić
FOOD ALLERGIES IN SARAJEVO CANTON 97

Vesna Petrović, Tanja Rožek Mitrović, Radmila Erceg-Javor
SCREEN TIME AND EXTRACURRICULAR SPORTS PARTICIPATION AMONG CHILDREN IN A LOCAL COMMUNITY IN SERBIA 109

CASE REPORT

Jasmina Mrgud, Ana Jevrić, Vlastimir Vlatković, Branislav Gašić
PARANEOPLASTIC SYNDROME AS A POSSIBLE CAUSE OF PULMONARY THROMBOEMBOLISM IN A FEMALE PATIENT WITH NEPHROTIC SYNDROME 114

HISTORY OF MEDICINE

Dušan Petar Kuljančić
ANDRIJA ŠTAMPAR - FOUNDER OF THE YUGOSLAV PUBLIC HEALTH SERVICE AND YUGOSLAV AMBASSADOR TO THE WHO 118

INSTRUCTION FOR CONTRIBUTORS 122

Vol. 45 (2020) No. 3 TIMOK MEDICAL GAZETTE Original papers

ACUTE BACTERIAL MENINGITIS IN THE ZLATIBOR DISTRICT

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SUMMARY: Introduction: Acute bacterial meningitis is present worldwide, with a lethality rate up to 50%. The most common causes are Streptococcus pneumoniae and Neisseria meningitidis. The aim of the research is to analyze acute bacterial meningitis in the Zlatibor district. **Material and methods:** Patients treated at the General Hospital in Uzice were examined retrogradely. Demographic data, risk factors, hematological and biochemical data from blood and cerebrospinal fluid and the findings of computed tomography scan of the endocranium were analyzed. All patients underwent lumbar puncture. The etiological diagnosis was made by identifying the pathogens from cerebrospinal fluid or blood culture. The clinical course was monitored, and the prognosis was determined according to the Glasgow coma scale. **Results:** We examined 148 patients with acute bacterial meningitis (92 men, 56 women), mean age 55.8 +/- 13.1. Half of the patients had comorbidities. In 42%, the possible focus of infection was sinusitis. Main symptoms were headache (100%), fever (97.2%), neck stiffness (95.9%). CSF analysis showed less than 100 polymorphonuclear leukocytes/mm3 in 65% of patients, and CSF protein elevation in 95.3%. 94.6% of patients had leukocytosis in the blood, and 86.5% had elevated C-reactive protein. The most commonly isolated bacterium was Streptococcus pneumoniae (40.5%). 74.3% of patients had a favorable disease outcome. One third of the patients showed epileptic seizures. In 16.2% of patients, the disease ended lethally. Risk factors for lethal outcome were the presence of comorbidities, Streptococcus pneumoniae as the pathogen, the occurrence of epileptic seizures, age over 50 years and male gender. **Conclusion:** The most common cause of acute bacterial meningitis in adult population of the Zlatibor district is Streptococcus pneumoniae, which is also the most common cause of adverse disease outcomes. Majority of patients are men over the age of 50 with comorbidities, which are also a risk group for an unfavorable disease outcome.

Key words:, Acute Meningitis - bacterial; Pneumococcal Meningitis; Acute Meningitis- clinical course; Acute Meningitis- risk factors; Acute Meningitis-disease outcome;

INTRODUCTION

Acute bacterial meningitis (ABM) is an infectious disease with significant morbidity and mortality worldwide. Mortality in untreated patients is up to 50%, in treated 8-15%. Having gone through the disease, 10-20% of patients remain with permanent neurological and mental disorders. [1]. Etiological agents depend on age and geographical area. Streptococcus pneumoniae and Neisseria meningitidis are the most common causes of ABM in adults [2]. Hemophilus influenzae is the cause of ABM at all ages, more common in the population of children up to 5 years of age before the mandatory vaccine [3]. The etiological diagnosis requries isolation of the causative agent from the cerebrospinal fluid (CSF), but meningism is possible with the presence of bacteria in the blood [4]. Predisposing factors for the development of ABM include head trauma, sinusitis, otitis, pharyngitis, pneumonia, but also other immunodeficient conditions such as alcoholism, splenectomy, neurological and hematological diseases.

THE AIM of this study was to analyze the epidemiological characteristics, etiology, risk factors, clinical course and prognosis of acute bacterial meningitis in the adult population in the Zlatibor district.

MATERIAL AND METHODS

The research included patients treated at the Department of Infectious Diseases and the Intensive Care Unit of the General Hospital Uzice, in the period from 1st. January 2009 to 31st

December 2019. Demographic data, risk factors, hematological and biochemical data from blood and CSF, cytological findings of CSF were collected retrospectively. The clinical course and outcome of the disease were analyzed, too.

Hematological and biochemical analyses from blood and CSF were performed by standard methods used in the Republic of Serbia. The etiological diagnosis was made by identifying the causative agent from CSF culture or blood, when CSF culture was negative or unavailable. Samples of CSF were cultured on blood agar plates containing 5% sheep blood and on chocolate agar, incubated in carbon dioxide for 24 - 48 h at 37° C. Isolates of Streptococcus pneumoniae and Neisseriae meningitidis were preliminarily identified based on typical colonial prospects, Gram staining and optochin test for Streptococcus pneumoniae. The Vitek system (bioMérieux, Marcy l'Etoile, France) was used for the final identification and testing of antibiotic susceptibility. The minimum inhibitory concentration test was performed by the E test, according to CLSI guidelines [5].

All patients underwent ophthalmic examination of the fundus and/or computed tomography (CT) scan of the endocranium.

Patients with tuberculous meningitis were excluded from the study.

The outcome of the disease was assessed on the basis of the Glasgow Coma Scale with the following values:

score 1 - death; score 2 - inability of patients to interact with the environment; score 3 - inability of the patient to live independently, but there is an interaction with the environment; score 4 - ability to live independently with incapacity for work; score 5 - working ability. The favorable outcome of the disease was defined by a score of 5, while scores 1 to 4 were marked as an unfavorable outcome [6].

The Statistical Package for Social Sciences SPSS (version 16.0) was used for statistical analysis. A significant difference was represented by $P < 0.05$.

RESULTS

A total of 148 patients with ABM was examined, 92 men and 56 women, aged 22 to 84 years of age, averaged 55.8 +/- 13.1.

A significant number of patients had comorbidities. A third of patients had diabetes and heart disease, 22.3% consumed alcohol excessively. The origin of the infection could be assumed in 88.5% of the patients. Sinusitis was significantly the most common at 41.9%. In 19.6% of patients, ABM was preceded by ear inflammation, in 12.8% by pharyngitis. All patients experienced headache on admission, 97.2% had fever, and 95.9% had neck stiffness during head anteflexion. Vomiting and photophobia were present in 76.3% and 75.6%, respectively. There was no statistically significant difference between the presence of these symptoms.

All patients underwent ophthalmologic examination of the fundus. CT scan of the endocranium was performed in 82.4%. Pathological finding in the sinus cavities was significantly the most common in 41.9%.

Epidemiological characteristics, comorbidities, possible focus of infection, symptoms and findings of CT scan of the endocranium are shown in Table 1.

Table 1. Epidemiological parameters, comorbidities, focus of infection, symptoms and CT scan finding in patients with ABM

Characteristics		ABM No (%)	*P
Age	21-30	9 (6.1)	0.00
	31-40	13 (8.8)	
	41-50	27 (18.2)	
	51-60	49 (33.1)	
	61-70	32 (21.6)	
	71-80	14 (9.5)	
	> 80	4	
Gender	Male	92 (62.2)	0.003
	Female	56 (37.8)	
Comorbidities	Diabetes mellitus	48 (32.4)	0.00
	HTA/CMP	50 (33.8)	
	Asthma/COPD	22 (14.9)	
	Alcoholism	33(22.3)	

	Neurological diseases	27 (18.2)	
	Psychiatric diseases	9 (6.1)	
	Total	75 (50.7)	0.00
Probable focus of infection	Head trauma	7 (4.7)	0.00
	Otitis	29 (19.6)	
	Sinusitis	62 (41.9)	
	Dental infections	7 (4.7)	
	Pharyngitis	19 (12.8)	
	Pneumonia	9 (6.1)	
Symptoms on admission	Headache	148 (100)	0.06
	Vomiting	113 (76.3)	
	Photophobia	112 (75.6)	
	Neck stiffness	142 (95.9)	
	Fever > 38o	144 (97.2)	
CT scan of the endocranium	Cerebral edema	38 (21.6)	0.00
	Content in the sinuses	62 (41.9)	
	Mastoiditis	6 (4.1)	
	Hydrocephalus	2	
	Recent cerebral infarction	14 (9.5)	

*P - statistical significance for samples ≥ 5

All patients underwent lumbar puncture. The number of polymorphonuclear leukocytes was significantly up to 100/mm3. In a significant majority of patients (95.3%), CSF proteins were elevated, while CSF/blood glucose index was reduced in 40.5% of subjects. The value of protein in the CSF was from 0.22 - 6.1 g / L, on average 2.8 +/- 2.2 g / L.

The most common causes of ABM were Streptococcus pneumoniae and Neisseria meningitidis, in 40.5% and 26.3%, respectively. Other pathogens were significantly rarer.

Serum biochemical parameters of bacterial infection, leukocytosis and elevated C-reactive protein (CRP) level, were observed in a significant number of patients, 94.6% and 86.5%, respectively. The leukocyte count ranged from 5.6 to 16.2x109 / L, averaging 12.4x109/L. The CRP value range was 3.4 - 122 mg/L, averaging 34.1 +/- 45.2 mg / L.

Biochemical findings from blood and cerebrospinal fluid, cytological findings of cerebrospinal fluid and etiological causes of acute bacterial meningitis are shown in Table 2.

Table 2. Biochemical findings of blood and CSF, cytological findings of CSF and etiological agents of ABM

Laboratory parameters		ABM No (%)	P
WBC (x109 /L)	>10	140 (94.6)	0.00
C - reactive protein (mg/L)	>10	128 (86.5)	0.00
CSF polymorphonuclear/mm3	< 100	96 (64.9)	0.00
	100 - 1000	40 (27)	
	> 1000	12 (8.1)	
CSF protein (g/L)	> 0.47	141 (95.3)	0.00
CSF glucose/serum glucose (mmol/L)	< 1/3	60 (40.5)	0.06
CSF isolates	Streptococcus pneumoniae	60 (40.5)	0.00
	Neisseria meningitidis	39 (26.3)	
	Hemophilus influenzae	12 (8.1)	
	Staphylococcus aureus	10 (6.8)	
	Listeria monocytogenes	5 (3.4)	
	Escherichia coli	5 (3.4)	
Blood culture isolates		9 (6.1)	

The clinical course was favorable in a significant majority (74.3%) of the patients. One third of patients had epileptic seizures. In 24 (16.2%) patients the disease ended lethally (Table 3).

Table 3. Clinical course and outcome of patients with ABM

Clinical course of diseases		ABM No (%)	*P
Focal neurological changes		2	
Epileptic seizures		49 (33.1)	0.001
Cardiorespiratory changes		9 (6.1)	0.00
Changes in mental status		4	
Glasgow coma scale at discharge	1	24 (16.2)	0.00
	2	2	
	3	4	
	4	8 (5.4)	
	5	110 (74.3)	

*P - statistical significance for samples ≥ 5

Risk factors for unfavorable disease outcome were further examined (Table 4)

Table 4. Risk factors for unfavorable outcome of ABM

Risk factors	ABM favorable outcome N (%) 110 (74.3)	ABM unfavorable outcome No (%) 38 (25.6)	P
Age > 50	64 (56.4)	35 (86.8)	0.011
Male	80 (52.7)	12 (31.6)	0.020
Comorbidities	46 (41.8)	29 (76.3)	< 0.01
Sinusitis	48 (43.6)	14 (36.8)	0.458
Epileptic seizures	29 (26.4)	20 (52.6)	0.003
WBC (x109 /L) > 10	105 (95.5)	35 (92.1)	0.803
C - reactive protein (mg/L) >10	100 (90.9)	28 (73.7)	0.180
CSF polymorphonuclear/mm3 <100	68 (61.8)	28 (73.7)	0.306
CSF protein (g/L) > 0.47	105 (95.5)	36 (94.7)	0.956
Streptococcus pneumoniae	36 (32.7)	24 (63.2)	0.002

Significant factors for the unfavorable outcome of acute bacterial meningitis were the presence of comorbidities, Streptococcus pneumoniae as the cause of the disease, the occurrence of epileptic seizures, age over 50 and male gender.

DISCUSSION

Analysis of the causes of ABM has indicated differences depending on a wide range of examined age groups in recent years [7].The most common causes are Streptococcus pneumoniae and Neisseria meningitis in adult population, while in children the most common are Streptococcus agalactiae, Escherichia coli, Listeria monocytogenes [8]. Our study included adult population and the frequency of individual pathogens corresponds to the above conclusion of other researchers. Haemophilus influenzae is a childhood pathogen, significantly rarer after the vaccine became mandatory [8]. In our study, it was present in 8.1%, which is expected given that it is the most common colonizer of the respiratory tract mucosa, and especially common in persons with chronic obstructive pulmonary disease [9].

Demographic data showed that men got sick more often, which corresponds to the finding of Diaz and colleagues who proved that men with ABM have more frequent head trauma and excessive alcohol consumption as risk factors [10]. The main risk factor of our patients was hypertension/cardiomyopathy. This can be explained by older age of the patients. Diabetes mellitus was the second most important risk factor. Diabetes leads to changes in body's immune defenses. The function of polymorphonuclear leukocytes is reduced, especially when acidosis is also present. Leukocyte adhesion, chemotaxis, and phagocytosis were also altered and antioxidant bactericidal systems were weakened [11].

Inflammation of the sinuses and ear are more common possible sources of infection in our patients, unlike other studies [12]. This result can be explained by the proven high percentage of bacterial sinusitis in the adult population [13, 14]. This finding is supported by the finding of CT scan, which most often

indicated a pathological process in the sinuses. In addition to headache, neck stiffness and fever with a change in mental status were the most common symptoms of both our study and others. [12]. The clinical course of our patients was accompanied by the occurrence of epileptic seizures in one third of patients. CNS infections as a cause of epilepsy are present in a quarter of patients with ABM [15]. Epileptic seizures have been shown to correlate with lower sugar values and higher protein values in CSF [16]. Risk factors for subsequent unprovoked seizures include focal discharge, sharp electroencephalographic waves, and initial CSF glucose <20 mg / dl [17]. The cytological finding of CSF with pleocytosis with the dominance of polynuclear neutrophils is a standard finding in ABM, which corresponds to our results. Elevated protein values present in a significant majority of our patients are expected findings for bacterial meningitis, although there are data in literature that 1-10% of patients with ABM do not have elevated CSF protein [18]. The value of glucose in CSF was reduced in 40% of our patients. This is consistent with other data describing less than 50% of patients with similar findings. The results indicate the unreliability of this parameter in the diagnosis of bacterial meningitis [19].

The serum parameter of inflammation, C - reactive protein, was elevated in a large percentage of our patients. Browver and coauthors pointed out the unreliability of CRP values in the diagnosis of ABM [20].

The unfavorable clinical course in our patients is smaller than described [12]. The most common cause of death is Streptococcus pneumoniae. The most significant risk factors are advanced age and the presence of comorbidities, which corresponds to the findings of other authors [12]. Our finding is partly consistent with the findings of other authors who mention the most common age over 65 years [12]. Respondents from Nis authors were mostly of the same age group as ours, with researchers noting that older people often have more sparse symptoms at the beginning of the disease [21]. The authors explain the small percentage of bacterial isolates from CSTs by using antibiotic therapy before taking CSTs. This can delay the diagnosis and adversely affect the further clinical course and outcome of the disease. Interesting are the conclusions of the authors who examined the influence of climatic factors on the occurrence of bacterial meningitis and obtained a positive correlation with the occurrence of wind and fog, and a negative correlation with insolation [22]. It can be assumed that it would be useful to analyze climate data in our patients as well.

CONCLUSION

The expected causative agent of a disease in a patient population is of great importance for each geographical area. The most common cause of acute bacterial meningitis in the adult population of Zlatibor district is Streptococcus pneumoniae, in 40.5% of patients, which is also the most common cause of adverse disease outcomes. The second most common is Neisseria meningitidis (26.3%). ABM is most common in men in their sixth decade of life who have comorbidities. The occurrence of epileptic seizures during ABM is also a risk factor of unfavorable outcomes of disease. The sourse of ABM is most often in the sinuses or ear, so timely treatment of these infections is an important preventive measure. Since there is a vaccine prophylaxis for Streptococcus pneumoniae and Neisseria meningitidis, it is necessary to recommend this preventive measure to the elderly, especially those who have comorbidities.

REFERENCES

1. World Health Organization (WHO). Meningococcal meningitis: Fact sheet 2017 [updated December 2017; cited 2017 November 9]. Dostupno na: http://www.who.int/mediacentre/factsheets/fs141/en/.
2. Centers for Disease Control and Prevention (CDC). Bacterial Meningitis 2017 [updated January 25, 2017]. Dostupno na: https://www.cdc.gov/meningitis/bacterial.html.
3. World Health Organization (WHO). Haemophilus influenzae type b (Hib) Vaccination Position Paper July 2013. Releve epidemiologique hebdomadaire. 2013; 88 (Suppl 39): 413-26.
4. McGill F, Heyderman RS, Michael BD, et al. The UK joint specialist societies guideline on the diagnosis and management of acute meningitis and meningococcal sepsis in immunocompetent adults. J Infect. 2016; 72: 405–38.
5. European Committee on Antimicrobial Susceptibility Testing, Breakpoint tables for interpretation of MICs and zone diameters, 2011 EUCAST Version 1.3. Available from: http://www.eucast.org/clinical_breakpoints/
6. Jennett B, Teasdale G. Management of head injuries. 2nd ed. Philadelphia: F.A. Davis, 1981.
7. Oordt-Speets AM, Bolijn R, van Hoorn RC, Bhavsar A, Kyaw MH. Global etiology of bacterial meningitis: A systematic review and meta-analysis. PLoS ONE

2018;13(6):e0198772. Available from: https://doi.org/10.1371/journal.pone.0198772.
8. Brouwer MC, Tunkel AR, van de Beek D. Epidemiology, diagnosis, and antimicrobial treatment of acute bacterial meningitis. Clinical microbiology reviews. 2010; 23 (Suppl 3): 467-92.
9. Murphy TF, Brauer AL, Sethi S, Kilian M, Cai X, Lesse AJ. Haemophilus haemolyticus: a human respiratory tract commensal to be distinguished from Haemophilus influenzae. J Infect Dis. 2007; 195 (Suppl 1): 81-9.
10. Yerramilli A, Mangapati P, Prabhakar S, Sirimulla H, Shravani Vanam S, Voora Y. A study on the clinical outcomes and management of meningitis at a tertiary care centre. Neurol India. 2017; 65 (Suppl 5):1006-12.
11. Joshi N, Gregory M. Caputo, Michael R. Weitekamp, A.W. Karchmer. Infections in patients with diabetes mellitus.N Eng J Med. 1999; 341: 1906-12.
12. Beek D, Gans J, Spanjaard L, Weisfelt M, Reitsma JB, Vermeulen M. Clinical Features and Prognostic Factors in Adults with Bacterial Meningitis. N Engl J Med. 2004; 351: 1849-59.
13. Sami AS, Scadding GK, Howarth P. A UK Community-Based Survey on the Prevalence of Rhinosinusitis. Clin Otolaryngol. 2018;43 (Suppl 1): 76-89.
14. Bhattacharyya N, Gilani S. Prevalence of Potential Adult Chronic Rhinosinusitis Symptoms in the United States. Otolaryngol Head Neck Surg.2018; 159 (Suppl 3): 522-5.
15. Preux PM, Druet-Cabanac M. Epidemiology and etiology of epilepsy in sub-Saharan Africa. Lancet Neurol 2005; 4: 21-31.
16. Chang CJ, Chang HW, Chang WN, Huang LT, Huang SC, Chang YC, Hung PL, Chang CS, Chuang YC, Huang CR, Tsai NW, Tsui HW, Wang KW, Lu CH. Seizures complicating infantile and child-hood bacterial meningitis. Pediatr Neurol 2004; 31: 165-71.
17. Pomeroy SL, Holmes SJ, Dodge PR, Feigin RD. Seizures and other neurologic sequelae of bacterial meningitis in children. NEngJ Med. 1990; 323: 1651-7.
18. Viallon A, Botelho-Nevers E, Zeni F. Clinical decision rules for acute bacterial meningitis: current insights. Open Access Emergency Medicine 2016; 8: 7-16.
19. Durand ML, Calderwood SB, Weber DJ, et al. Acute bacterial meningitis in adults. A review of 493 episodes. N Engl J Med. 1993; 328 (Suppl 1): 21-8.
20. Brouwer MC, Thwaites GE, Tunkel AR, Van De Beek D. Dilemmas in the diagnosis of acute community-acquired bacterial meningitis. Lancet. 2012; 380 (9854): 1684-92.
21. Ranković A, Vrbić M, Jovanović M, Popović-Dragonjić L, Đorđević-Spasić M. Meningeal syndrome in the practice of Infectious diseases. Acta Medica Medianae 2017; 56(2): 32-7.
22. Janković Lj, Pantović V, Damjanov V. Korelacija između klime i bakterijskog meningitisa. Medicus 2006;7 (1):29-31.

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FOOD ALLERGIES IN SARAJEVO CANTON

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SUMMARY: Introduction: Food allergies have been recognized as significant health issue in last two decades. Prevalence is from 3-38 % of self-reported cases, i.e. 1-7% of those that have been diagnosed as allergies. Numerous projects have been undertaken during last years in order to determine prevalence of food allergies, most frequent allergen types, cause of allergies, link with other health problems, methods of diagnosing, risk control management in food industry, adjustment of legislation in accordance to the needs of allergic persons etc. While some countries have done a lot when it comes to this issue, others even do not have yet data on food allergies in their area, and this is the situation in BiH too. RESEARCH GOALS: Establish food allergy prevalence from survey in Sarajevo Canton. Establish frequency of some other allergies in subjects. **Material and methods:** This is a cross-sectional study on allergies and it was conducted during March and April, 2017 amongst Sarajevo Canton population of both genders and all age groups by random sampling method. Specifically designed survey questionnaire consisting of 16 questions was filled in by 480 subjects. The research was conducted retrospectively. **Results:** Results of the survey conducted in Sarajevo Canton are: 51% of persons reporting to have some type of allergy, while 20% of that is reported food allergy cases, i.e. 11.67% of diagnosed food allergy cases, in relation to the total number of 480 subjects (100%) who participated in the survey. The most frequently reported allergens are: milk and dairy products, cereals, eggs, peanut, nuts, fish (including mollusks and crustaceans) and eggs. **Conclusion:** As per obtained results of food allergy prevalence in our research in total surveyed sample of 480 subjects, there are 96 (20%) of subjects, which indicates that the problem of allergies in Sarajevo Canton is significant, with frequency in values characteristic for other regions of Europe and the world. Legislation is harmonized at a regular basis with the EU Acquis communautaire, but there is lack of easily accessible information, that people with allergies could use to facilitate the process of diagnosing, preventing contact with allergens and coping with them in everyday life.
Keywords: Food allergies -prevalence; allergens in food ; Sarajevo Canton

INTRODUCTION

The allergy is a disorder of an individual's immune system, i.e. a negative reaction to external stimuli that are completely harmless to most people. The term allergy is of Greek origin and was formed by joining the word alos = altered and ergeia = reaction. The spectrum of allergy cause is very broad, ranging from substances in the environment (pollen, dust, sun etc.), animals, medicines, food etc. [1]. A special segment of this problem is reactions to food allergens. The food represents human's primary need, thus it is necessary for maintaining life and health of people. Also, food is a source of satisfaction, especially in richer societies with diversity of food offer. While for majority food is a source of pleasure, for individuals, food may represent a danger leading to unpleasant reactions, and even to death in the most extreme cases [2]. The allergic reaction to food is defined as a disorder that is a consequence of IgE-specific immune response that re-occurs after the exposure to a particular type of food [3]. Although food allergies have been known for a long time, this problem has attracted more attention in the last twenty years. It is interesting to note that Hippocrates, father of medicine, had already observed and described some allergic reactions to food 2000 years ago [4]. Food allergens are natural proteins that are resistant to effects of heat, proteolytic enzymes and pH change. An individual's immune system may react with a very small amount of allergens present [5]. Generally, allergies are looked upon as a major health problem, but there is also perception that prevalence and severity of symptoms are increasing. According to available data and studies, the prevalence ranges from 1-

3% in adults and even up to 8% in children of up to 3 years of age [6].

Food allergies represent disorder that is more and more talked about worldwide. The prevalence is generally from 1-7% of the total population. The importance of individual allergens depends on age, while prevalence of individual allergens depends on geographical area. The most common allergens in infants and children under 3 years of age are milk and eggs. In the USA, peanuts are very common cause of allergies in younger population, while this allergy is completely unknown in Greece. Fish allergies are common in Spain and Japan, while sesame allergy is common in Israel. In France, mustard is one of major allergens. Each geographical area has its own characteristics when it comes to frequency of allergies and prevalent type of allergen [7]. Generally, the incidence of allergies and types of allergens change over time. The problem of food allergies has evolved from being individual problem to becoming a significant healthcare problem. Although the incidence of allergies is very different (as is the type of allergen) by individual regions worldwide, it is estimated that about 25% of the population is already at risk [8]. Given that the only way to combat allergies is to avoid food allergens, it is clear that knowledge and information are of great importance to allergic persons. In this regard, legislation is of great importance for safety and health of these individuals. That is why the work is still ongoing to improve the laws governing this area.

For EU (European Union) Member States, the EC (European Commission) directives and regulations are binding, with the possibility for each country to amend its laws according to its specific needs. One of the ways is to adhere to the list of binding allergens on food product declarations [9].

OBJECTIVES OF THE PAPER

Establish whether there is a problem with food allergies in Sarajevo Canton.

Establish the frequency of some other allergies in subjects.

MATERIAL AND METHODS

This cross-sectional study of food allergies was conducted during March and April, 2017 among residents of Sarajevo Canton of all age groups and by random sampling method. Special survey questionnaire was designed, and it was filled in by 480 subjects. This research was conducted retrospectively. As previously mentioned, the research was conducted based on the survey questionnaire. The research was performed of the available data on studies conducted in BiH and the region, concerning the food allergy prevalence. “Food Allergy“survey questionnaire was prepared and it consisted of 16 questions answered by the subjects. So, the questionnaire had been created specifically for this research in Sarajevo Canton, i.e. all population categories were included. The survey of the subjects is conducted in the following ways: (1) Direct interview with a subject; (2)Contact with subjects vie e-mail; (3) Via social network (Google Disc). Direct interviewing of subjects was conducted in order that research would comprise all age-related and social groups of Sarajevo Canton population, as well as to obtain data for certain number of families with all their members. The research was conducted in the period March – April, 2017.

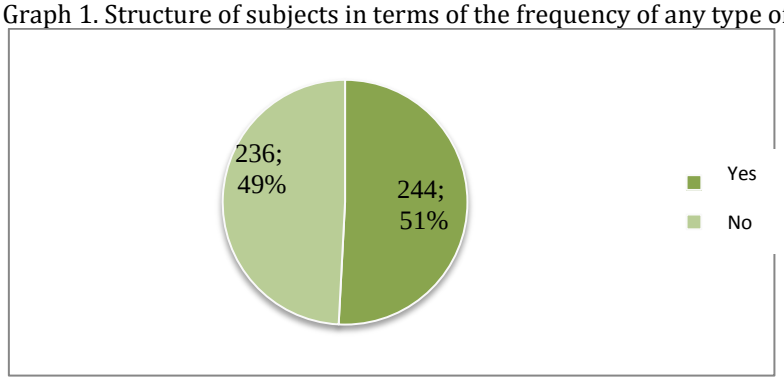
Statistical data processing : The research results are presented in accordance with the filled in questionnaire, in the form of absolute numbers (N) and percentage values (%). Statistical data processing was done using the statistical calculator “Social Science Statistic“. For the nominal variables, Chi-Square Test and ANOVA test were used. P value <0,05 was considered statistically significant.

RESULTS

The total number of subjects surveyed in Sarajevo Canton is 480. Of the total number of surveyed, 168 (35%) are male persons, and 312 (65%) are female persons. The number of female subjects is significantly higher than number of male subjects (Chi-Square Test, $\chi 2 = 22{,}0972$, $p = 0{,}00003$; for $p < 0{,}05$)

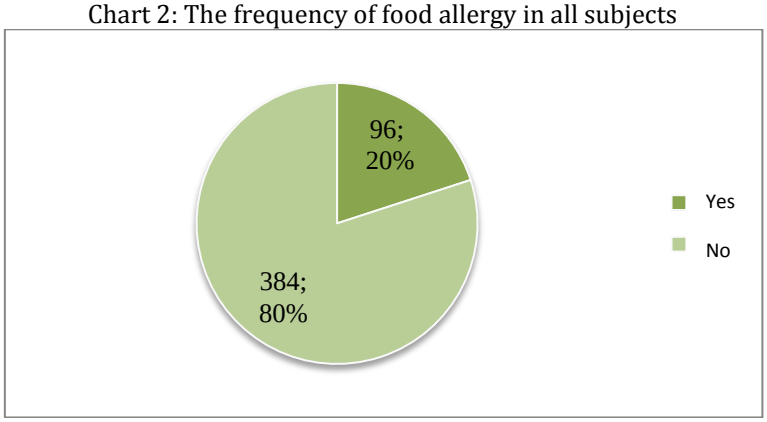
The number of subjects under 18 years of age was 37 (8%) and was significantly lower than the number of adults: 443 (92%) (Chi-Square Test $\chi 2 = 209{,}1042$, $p < 0{,}05$)

Chart 1: Graph 1. Structure of subjects in terms of the frequency of any type of allergy



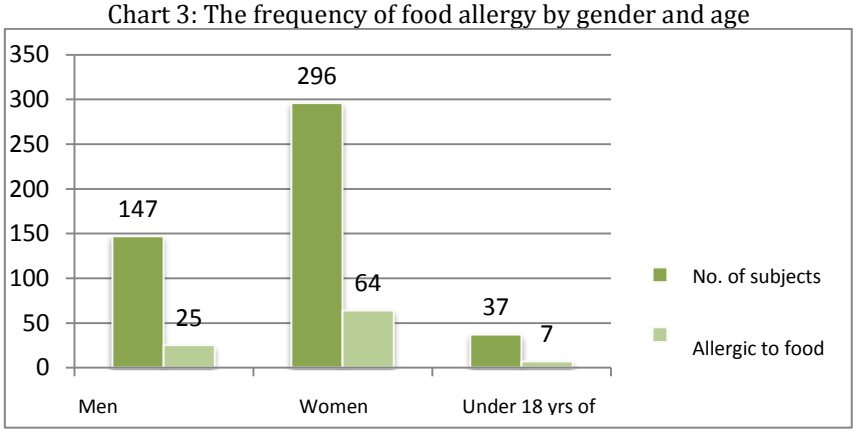
Of 480 subjects, 244 subjects (51%) gave a positive answer, while 236 (49%) subjects gave a negative answer, i.e. there is no significant difference between the group with allergy and the group without allergy (Chi-Square Test: $\chi 2 = 0{,}0667$; $p = 0{,}796246$, for $p < 0{,}05$)

Chart 2: The frequency of food allergy in all subjects



Of 480 subjects, 96 (20%) answered that they had a food allergy, i.e. 384 (80%) answered they did not have a food allergy, which represents significant difference between these two groups of subjects (Chi-Square Test: $\chi 2 = 94{,}9451$, $p < 0{,}05$).

Chart 3: The frequency of food allergy by gender and age



Of the total number of men (147), 122 (83%) of them are not allergic to food, while 25 (17%) of them are. Among women, the number of those allergic to food is 64 (22%), while among younger ones – under 18 years of age, the number of those allergic to food is 7 (19%). Percentage of men, women and children is not significantly different (Chi-Square Test: $\chi 2 = 1{,}3366$; $p = 0{,}512568$; $p < 0{,}05$). Of 480 subjects, 244 confirmed some form of allergy, and of those 244,96 (39%) also have a food allergy, while 148 (61%) have some other form of allergy. Subjects allergic to food (96 of them), in 49% of cases are allergic to other allergens, too.

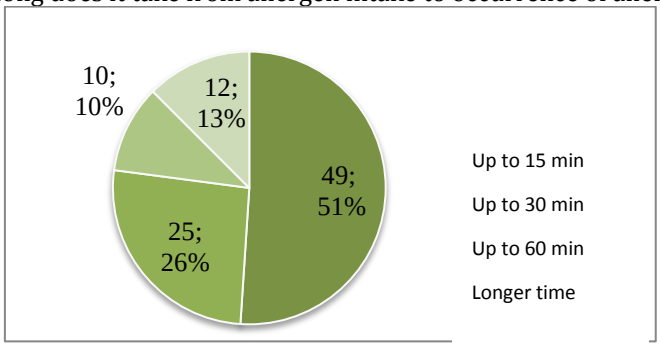
There is no significant statistical difference between these two subject groups (food allergies only and food allergies in combination with another form of allergy). (Results of Chi-Square test are: $\chi 2 = 0{,}0208$; $p = 0{,}885228$; $p > 0{,}05$)

Table 1. Presentation of foodstuff subjects are allergic to

Ordinal no.	Allergen	Number of subjects	% of number of subjects(480)	% of all food allergy subjects (96)
1	Dairy products	19	3,96	19,80
2	Eggs	6	1,25	6,25
3	Peanut	15	3,13	15,65
4	Cereals	16	3,33	16,65
5	Nuts	16	3,33	16,65
6	Fish, mollusks, crustaceans	13	2,71	13,55
7	Soy	4	0,83	4,15
8	Celery	1	0,21	1,05
9	Mustard	3	0,63	3,15
10	Sesame	1	0,21	1,05
11	Sulfur dioxide and sulfides	3	0,63	3,15
13	Fruit	6	1,25	6,25
14	Honey	1	0,21	1,05
15	Yeast	1	0,21	1,05
16	Food colors	1	0,21	1,05
17	Vinegar	1	0,21	1,05

Presentation of structure of frequency of allergens in food: most commonly allergies are reported to be to dairy products (3,96%), then to cereals and nuts (3,33% each).

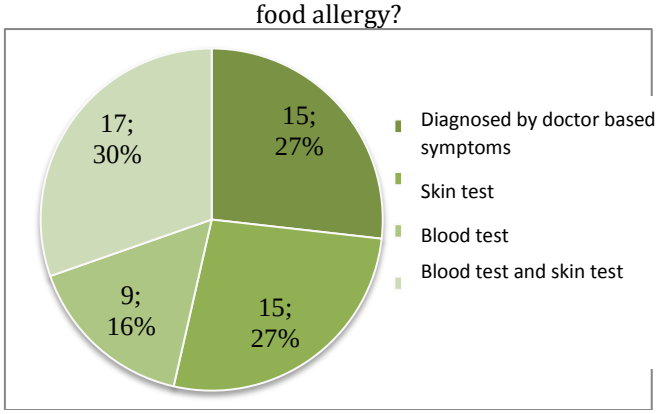
Chart 4.: How long does it take from allergen intake to occurrence of allergy symptoms?



According to presented chart, most commonly reactions occur immediately (within 15 minutes) in 51% of subjects, then after half an hour (25%). Of 96 subjects with food allergy, 29 of them (30%) were hospitalized due to allergy, while 67 (70%) were not. There is a significant statistical difference between these two groups of subjects (Chi-Square Test: $\chi 2 = 7{,}8274$, $p = 0{,}005146$, for $p < 0{,}05$).

Of the total number of subjects with food allergy, 56 (58%) of them were diagnosed, while 40 (42%) of them were not, which represents a significant statistical difference between these two groups (Chi-Square Test: $\chi 2 = 1{,}3427$, $p = 0{,}236566$, for $p < 0{,}05$).

Chart 5. Structure of subjects according to the answer to the question: In which way were you diagnosed a food allergy?



Out of the total of 56 subjects with accurate diagnosis, 15 (27%) of them did a skin test, 15 (27%) of them did a blood test, and 9 (16%) of them did both skin and blood test, while 17 (30%) of them were diagnosed based on symptoms without any additional tests. Types of test, i.e. way of diagnosing does not show any statistically significant difference (Chi-Square Test: $\chi 2 = 1{,}7629$, $p = 0{,}623037$; for $p < 0{,}05$).

In 55 cases (57%) the subjects allergic to food have family members with some allergy, which does not represent statistically significant difference in relation to the group of subjects whose family members do not have allergies (Chi-Square Test: $\chi 2 = 1{,}0263$, $p = 0{,}311032$, for $p < 0{,}05\%$).

The subjects gave the following answers to the question related to whether they check the contents on food articles:

Chart 6. Structure of subjects according to the answer to the question: if you are allergic to food, do you check contents on declaration?

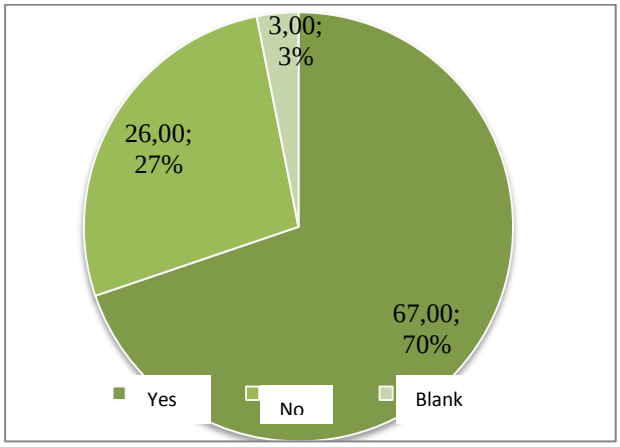
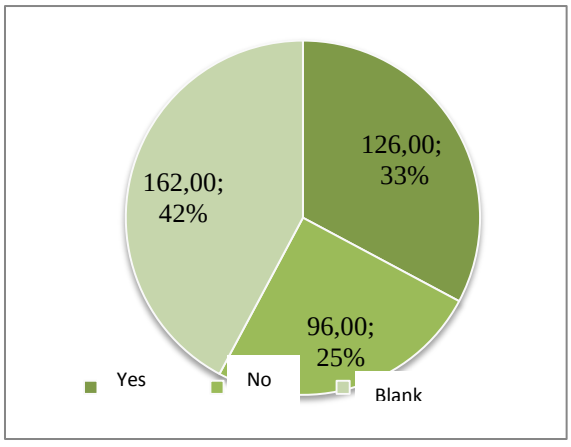


Chart 7. Structure of subjects according to the answer to the question: if you are not allergic to food, do you check contents on declaration?



Declarations, i.e. ingredients in food items are checked by 70% of persons with food allergies, while that percentage is only 33% in subjects without food allergies. From the above-mentioned, we conclude that there is statistically significant difference in habits of reading declarations in allergic persons and those who are not allergic (Chi-Square Test: $\chi 2 = 60{,}3412$, $p < 0{,}00001$, for $p < 0{,}05$). The subjects with food allergies are not generally satisfied with allergen labelling (70% of cases), while 21% of subjects are satisfied with current situation, and 9% of them did not answer this question.

Table 2: Impact of allergies on life quality

Impact on life quality	Number of answers	Percentage
Insignificant	23	23,96
Existing but I manage to cope with it	34	35,42
Existing	14	14,58
I often have problems	13	13,54
I am always worried	10	10,42
Blank	2	2,08
	96	100,00

Regarding the question of impact of allergies on life quality, significant difference exists between individual categories of answers. Majority of subjects have problems, but they manage to cope with it (34 subjects, or 35,4%), while smallest number of answers (10 subjects or 10,4%) is related to category "I am always worried" ($\chi 2$ = 40,915, $p<0,0001$, for $p \leq 0,05$).

DISCUSSION

The food allergy survey conducted in Sarajevo Canton comprised 480 subjects. Of the total number of subjects, 443 were adults or 92%, while those under the age of 18 were 37 or 8% (Chart 2). In the group of subjects, male persons were represented with 35% (168), and female persons with 65% (312) (Chart 1). Although there is significant difference in the number of females and males, this did not affect the survey results. There is no difference in the frequency of food allergies in terms of gender, and there is no significant allergic difference in gender in any of the studies available to us.

Out of 480 subjects, 244 (51%) of them reported having some form of allergy (pollen, house dust, hair, medicines, food, sun etc.), while 96 (20%) of them reported food allergies. Of the total number of allergy cases, the food appears as allergen to a significant extent in 39% of cases (Chart 6). Of the subjects allergic to food (total of 96), 49 (51%) of them have only food allergy, while the remaining 47 (49%) have also some other forms of allergies (Chart 7). In adults, the largest number of allergies is related to inhalation allergies and they develop as a consequence of IgE sensitivity to aeroallergens, with cross-reaction to food. Persons with allergy to pollen, latex, house dust and so on, have also cross-allergies to food of plant origin: fresh fruit, nuts and vegetable. Even 40% of adults allergic to pollen also have allergy to food of plant origin [6]. Some other studies state that prevalence of allergies to food samples is conditioned by geographical position, socio-economic conditions and eating habits. It has been known for a long time that food allergy affects children more than adults. Based on these researches, prevalence of allergic reaction to food is about 5% in adults and 8% in children, and these numbers are still increasing. As possible risk factor, they mention gender, vitamin D insufficiency, malnutrition and obesity, increased hygiene, genetics, atopic diseases, increased use of antacids, exposure time to allergen and so on. The most common allergens in child population are cow milk (2,2%), peanut (1,8%) and nuts (1,7%), while in adult population, these are mollusks (1,9%), fruit (1,6%) and vegetables (1,3%) [7].

The allergic reaction may be result of consumption of food with allergen, inhalation of vapors or contact with such food. Reactions vary from mild symptoms, such as rash and burning sensation to very difficult conditions such as anaphylactic shock [8].

Patients allergic to pollen often have cross allergy so they feel oral and pharyngeal allergic symptoms while eating fresh fruit and vegetables [10] .

In 2007, research of food allergies was conducted in children younger than 6 years of age in the area of city of Osijek, Republic of Croatia. The questionnaire was filled in by 810 parents, and the result obtained is that 5,4% of children are allergic to food. The most common causes of allergies are food additives, eggs, peanut and milk, and then honey, pesticides, fish and gluten. Conclusion of this research is that allergies develop in children in pre-school age (with high percentage of food additives as

allergy cause of nearly 41%), and that correct food labelling is of great importance due to a need to exclude dangerous foodstuff from nutrition [11]. Another research conducted in 2014 also in Republic of Croatia, Vukovar-Srijem Parish (General Parish Hospital) comprised infants 0-1 year and young children of 1-4 years. The research included 59 subjects suspected to have allergy to cow milk. After conducted testing, (determining specific IgE antibodies by standard immunofluorescent test), allergy was confirmed in 35,6% cases. Conclusion of the research is that allergy to cow milk is common in observed population, and that diagnosis is established relatively late. Higher percentage of allergy is established in boys of this age, as well as in children who live in villages [12].

In the Alergology Department of Clinic for Skin Diseases at University Clinical Center Tuzla, in 2009 and 2012, the patients (224 and 316 patients respectively) underwent intradermal testing. In the interval of just two years, significant increase of patients was observed and they were sensitized to specific allergens in food. As possible causes of increased number of cases of sensitivity, authors of the study mention changes of food allergenicity, lower standard of inhabitants and poor food quality, changes in eating habits and so on. In order to make more solid conclusions, it is necessary to conduct researches in longer period of time. According to data of this study, in the area of Tuzla Canton, in 2012, the most common positive food allergens were: vegetable (beans, peas and potatoes), mushrooms, flour, drinks (cocoa, coffee, green tea) and fruit [13].

Obtained results of food allergy prevalence in our research in the total number of subjects (20%) suggests that the problem of allergies in the Sarajevo Canton area is significant, and that the frequency is in the values which are characteristic also for other regions in Europe and the world. For example, in Great Britain, the percentage of persons (all ages) allergic to food is 20% (Young, 1994), in Germany, it is 34,9% (Zuberbier, 2004), in France, it is 3,24% (Kanny, 2001), in USA, it is 28% (Bock, 1987), in Holland, it is 12 % (Jansen, 1994), in Spain, it is 4,6 % (Woods, 2001), in Australia, it is 19,1% (Woods 2001), in Denmark, it is 13% (Osterballe 2005) etc. All presented data relate to self-reported cases, regardless of whether the subjects were diagnosed or not [7]. Research (Lee, 2017.) in Korea established that food allergy prevalence is very individual; it is a result of impact of culture, age, ethnicity and eating habits [14]. Generally accepted opinion is that food allergy prevalence has been on the increase in the last decades, in particular in western countries, but high quality evidence based on a diagnosis confirmed by testing regarding food allergy which would support this presumption is lacking, due to high cost and potential risks related to conducting a food test in broader population [15].

With regard to the issue of allergens in our research, the largest number of subjects, as in most researches available to us, was allergic to milk and dairy products (19 cases), cereals and nuts (16 cases each), followed by eggs, mollusks, fish, crustaceans, fruits and other. Of 14 allergens defined by statutory regulation as allergens that have to be labeled, the subjects reported allergies to everything on this list, except for lupine, while some others were added (Table 1).

Of the allergens that are not on the list - fruits, vinegar, honey, yeast and food coloring were reported. Nearly 3% of subjects answered they were allergic to other foods (which are not on the priority allergens list), without mentioning exactly the foods they were allergic to. Given that about 3% of subjects mentioned the foods not listed on the list prescribed by law, there is a need to conduct research in the area of BiH which will provide more data on these allergens. The tests conducted in Europe show that the most commonly reported allergens (not listed) are as follows: vegetables and mostly peas, tomato, spinach, eggplants and carrots, followed by chocolate, garlic, honey, pork, black pepper, pickled cucumbers, cocoa, potato, sugar, chicken and beef. So, Zuberbier (Germany, 2004) reports on prevalence of 1,8% for vegetables, while other studies (Gelincik 2008, Turkey; Mustafayev 2012, Turkey; Osterballe 2005, Denmark; Venter 2008, Great Britain) show prevalence of less than 0,5% when it comes to other allergens [16].

The percentage of allergens reported by subjects in our survey is in the range which is defined as the average by individual studies. The European Academy of Allergy and Clinical Immunology (EAACI) Project: in 2014, the results of the study on the prevalence of food allergies in Europe by the EAACI expert group for food allergies, were published, and based on reviews of available studies conducted in the period from 2000-2012. Although the researchers dealt with very

heterogeneous studies, an overview of frequency of basic allergens was made. The most common allergy is to cow's milk, wheat, eggs, followed by nut products, according to subjects' statements, and confirmed by oral food test [17].

Studies conducted in Great Britain relate to different age groups of children younger than 15 years of age. Prevalence for self-reported cases is from 11-33%, while percentage of allergies confirmed by the test is significantly lower (1-5 %). The most common allergens are eggs, milk, wheat and peanut [18], [19]. There is a lot of data suggesting that food allergies are common (comprising up to 10% of population), and prevalence has increased during the last three decades, but it seems that it disproportionately comprises persons in industrialized/western regions. They are more common in children in comparison to adults [20].

Our survey showed that of 96 food allergy cases, 56 (58%) were diagnosed, while 40 (42%) were not diagnosed, which did not represent significant statistical difference.

According to the answers of subjects, allergic reactions occur most commonly within 15 minutes after consumption (or contact, i.e. inhalation of the smell) of food, and this happens in as many as 51% of cases; within 30 minutes it happens in 26% of cases. Of 96 subjects, who report food allergy, 29 (30%) stayed in hospital due to the allergy. Of 56 subjects who were diagnosed with allergy, 15 did skin test, 9 did blood test, 17 did both tests (skin and blood test), and 15 were diagnosed by a doctor based on the symptoms.

Based on the answers by subjects, it was concluded that all mentioned diagnostic methods were used, and statistically, there was no significant difference in listed tests regarding their use. Percentage of diagnosed allergies is 11,67% in relation to the total number of subjects (480).

Taking into consideration that allergy cases often occur in several family members, this survey shows the datum that in 55 cases persons with food allergy also have some other family members with some allergy, which does not represent significant statistical difference.

Persons with food allergy apply elimination diets, i.e. they avoid taking food items they are allergic to. That is why clear and easily legible labelings are much more important to them. The survey showed that. When asked whether they read labeling on products, nearly 70% of subjects answered YES, while 33% of subjects without allergy gave that answer. Only 3 persons with allergy did not give answer to this question, nor 162 persons without allergy. When asked whether they are satisfied with allergen labeling on food products, of 96 persons with allergies, only 20 (21%) were satisfied, while 67 (70%) were not satisfied. Reasons of customers' dissatisfaction were not examined in this survey.

Also an online survey conducted in Great Britain (Anaphylaxis Campaign, 2005 and 2006) with a similar question (the question was: How good or bad do you assess the current system of labeling for allergic persons?") showed the following similar results: very good 0,8%, pretty good 32,5%, fairly bad 39,1%, very bad 26,3% and I do not know 1,3%. The answers fairly bad and very bad together make up 65,4%, while in our survey this percentage is 70%. One of the conclusions of this research is that it would be much easier for consumers to make a decision if preventive warning was defined, as well as the way of preventive warning that all the manufacturers would use in the same way.

One of the most important projects implemented in order to collect the data on food allergies in Europe is the EuroPrevall (The Prevalence, Cost and Basis of Food Allergy across Europe) project. It was financed by EU, project implementation started in 2005, and it lasted nearly 5 years. 63 partners from 23 countries were involved in the project, as well as collaborators from North America, Australia, New Zealand and Africa. The researches were carried out in accordance with legally adopted list of allergens in that period, as well as with some new foods that proved to be important allergens in some European regions. Priority no. 1 was: eggs, milk, nuts (hazelnut), fish, mollusks, peanut, apple, peach and celery, while priority no. 2 was: kiwi, mustard, sesame, soy, walnut and wheat.

The results of the studies are highly dependent on the geographical area in which the research is conducted. Common allergens across Europe are: apples and hazelnuts, then peanut, peach, celery, fish and shrimps. The listed foods are the priority no. 1 in Europe. Milk and egg allergies occur exclusively in children. Priority no. 2 is: kiwi and nuts, with kiwi as a significant allergen in entire Europe. The food of 3rd priority includes: carrot (important allergen in Lithuania), tomato, water-melon and banana. There are also some new allergens on the list

that have not been considered a priority until now [21].

Prevalence of food allergies in Europe - European Food Safety Authority (EFSA) 2011, this project was conducted with similar goal in Europe; the goal was "Gathering references and overview of frequency of food allergy in Europe". The project done by EFSA in 2011 directed its activities to the following: 1. Overview of available scientific data on frequency of food allergies; 2. Determination of concentration threshold for each allergen (where possible); 3. Overview of available analytical methods for determination of food allergens.

A total of 7333 articles were gathered, and 92 of them were taken into consideration. Of that number, 52 are related to European countries: Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Sweden, Italy, Holland, Norway, Portugal, Spain, Turkey and Great Britain. The studies comprised different age groups in the population, different allergens, as well as various data gathering and diagnosing methods. Some allergens were examined in detail (for example: milk, peanut and fish), while for others very little information exist (lupine and celery). When it comes to research of individual allergens, many studies exist, but as far as frequency of allergies is concerned, very small number of studies is selected in which control diagnosing is conducted. By examination of gathered studies, 27 studies were observed which gathered data on other food allergens (which are not usual). Other reported allergens in Europe are mainly: vegetables such as peas, tomatoes, spinach, eggplants and carrots, then chocolate, garlic, honey, pork, black pepper, pickles, cocoa, potato, sugar, chicken and beef. There has also been reported certain number of allergens as a general term: colors, additives and juices. In other regions in the world, the following are reported as allergens: cassava, buckwheat, duck, monosodium glutamate etc. [22]. In the research by Corinnne A. et al. 2018, authors recommend to avoid food containing allergens, although clinical practice changed in this view [23].

Since food allergies have a significant impact on the quality of life of an individual, as well as of his/her family, the last question of this survey was for the subjects to evaluate the impact of allergy on the quality of their lives. The subjects could evaluate the impact by means of 5 proposed answers, where the impact is graded from "insignificant", then "it exists, but I manage to cope with it", "it exists", "I have problems often", to the worst scenario "I am always worried". The largest number of subjects evaluated that "the problem exists, but they manage to cope with it" (34 answers, i.e. 35,4%), and the smallest number of subjects answered "I am always worried" (10, i.e. 10,4%) (Table 2).

The concept of the quality of life may have different meanings and generally it encompasses many factors: freedom, security, financial opportunities, spiritual pleasure, health, quality of environment etc. The quality of life related to health (QLRH) was defined by the WHO in 1993 in the following way: QLRH is the individual perception of our life in the context of culture and value system in which we live, and in relation to our goals". QLRH may be defined in a variety of ways, and basically implies personal perception of health, including physical shape, psychological status, social and professional possibilities etc. [24].

The existing Food Allergen Labeling Guide is also being further worked on within European Commission, and it relates to allergen list in Annex II of Regulation on Provision of Food Information to Consumers [25].

Considering that BiH imports food, most frequently from EU countries or regional countries, it is important for consumers that Republic of Croatia and Republic of Slovenia, as EU Members, had to harmonize their legislation with EU regulations and directives. We are also interested in the legislation of Republic of Serbia, which, even though it is not in EU, like BiH, is trying to harmonize its legislation with EU regulations and directives on a regular basis. In Serbia is in force the Rulebook on "Declaration, Labeling and Marketing of Food" ("Official Gazette" RS No. 85/2013) which has introduced, since 2014, mandatory labeling of 14 allergens, so they are clearly distinguished from other ingredients [26].

CONCLUSION

Results obtained on food allergy prevalence in our research in total number of subjects, i.e. of 480 subjects, 96 (20%) of them indicate that problem of allergy in the area of Sarajevo Canton is significant, and frequency is within the values which are characteristic for other regions in Europe and worldwide.

List of reported allergens mainly corresponds to the list of obligatory allergens defined by law.

The most common allergens are dairy products (3,96%), cereals (3,33%), peanut (3,13%), nuts (3,33%), fish with mollusks and crustaceans (2,71%), then eggs (1,25%), soy (0,83%), mustard (0,63%), sulfur dioxide and sulfides (0,63%), celery (0,21%) and sesame (0,21%). The only allergen not mentioned by the subjects is lupine, the use of which is not traditional in BiH, but may be expected in imported products.

70% of persons allergic to food showed dissatisfaction by food labeling This high percentage of dissatisfied consumers (who also have significant health problems) indicates the need to examine reasons for dissatisfaction, and to start initiatives for positive changes in accordance with consumer needs.

Considering that food allergies significantly impact life quality of individual as well as his entire family, and adequate treatment is non-existent, generally, this problem has to be solved in a way to provide, for the population, the best possible conditions in which they will be able to control themselves the type of food they consume.

EU and BiH food regulations have been analyzed, and in relation to food allergens. It is concluded that food regulations in BiH are harmonized with EU regulations on a regular basis, which is of great importance for persons allergic to food.

For food allergy related disorders there is no adequate therapy yet, so the only way is prevention, i.e. avoidance of allergens we are sensitive to.

REFERENCES:

1. Kizis D, Siragakis G., Introduction, Food Allergen Testing, Wiley Blackwell, 2014; 286.
2. Taylor SL, The Basic of Food Allergy, Detecting allergens in food, Woodhead Publishing Limited 2006; 292-322.
3. Sihrer SH, Sampson HA., Food allergy. Journal of Allergy and Clinical Immunology 2010;125: 116-25.
4. Sampson SH, Sampson HA., Food allergy. Journal of Allergy and Clinical Immunology 2004;113: 805-19.
5. Grujić R, Alergeni u hrani, prisustvo, rizici i upravljanje u prehrambenoj industriji, Journal of Engineering & Processing Management, 2015; 7 (1): 7-25
6. Fernández-Rivas M, Ballmer-Weber B., Food allergy: current diagnosis and management, Managing allergens in food, Woodhead Publishing Limited, 2007; 25-43.
7. Sihrer SH, Sampson HA., Food allergy: Epidemiology, pathogenesis, diagnosis and treatment, Journal of Allergy Clin Immunology 2014;133: 291-307.
8. Antonis Lampidonis and George Siragakis, Allergens in the food industry: customer and legislation demands, Food Allergen Testing Molecular, Immunochemical and Chromatographic Techniques, John Wiley & Sons, Ltd, 2014;224.
9. Kerbach S., Alldrick A.J., Crevel RW.R, Domotor L., Dunn Galvin A., Mills E.N. C., Pfaff S., Poms R.E., Tomoskozi S and Popping B., Protecting food allergic consumers: managing allergens across the food supply chain, Allergen Management in the Food Industry, John Wiley & Sons, Inc., Hoboken 2010; 33-52.
10. Brandtzaeg P. The gut as communicator between environment and host: Immunological consequences. European Journal of Pharmacology 2011; 668(Suppl 1):S16-32. doi: 10.1016/j.ejphar.2011.07.006. Epub 2011 Jul 28.
11. Pavlović N, Vlahović J, Miškulin M, Pojavnost alergija na hranu u populaciji djece predškolske dobi s područja grada Osijeka, Zavod za javno zdravstvo Osječko-baranjske županije, Sveučilište u Osijeku, Medicinski fakultet, Simpozij „Hranom do zdravlja“ 2014.
12. Vrdoljak D, Miškulin M, Vlahović J, Pavlović N, Diagnostic approach to cows milk allergy in the population of infants and early preschoolers from the Vukovar-Srijem county. Food in health and disease, 2014; 3(2):84-89.
13. Šadić S., Maletz Čatić Z, Nutritivne alergije, Hrana u zdravlju i bolesti, znanstveno stručni časopis za nutricionizam i dijetetiku, 2013; 2(1): 28-35.
14. Lee S., IgE-mediated food allergies in children: prevalence, triggers, and management. Korean J. Pediatr. 2017; 60: 99-105.
15. Mimi L. K. Tang, Raymond J, Mullins., Food Allergy: is prevalence increasing? Internal Medicine Journal, 2017; 47(3): 256-261.
16. Joshi P, Mofidi S, Sicherer S H. Interpretation of commercial food ingredient labels by parents of food-allergic children. Journal of Allergy and Clinical Immunology, 2002; 109(6): 1019–21.
17. Nwaru BI1, Hickstein L, Panesar SS, Roberts G, Muraro A, Sheikh A; EAACI Food Allergy and Anaphylaxis Guidelines Group, Prevalence of common food allergies in Europe: a systematic review and meta-analysis, 2014; 69(8):992-1007.
18. Crevel RWR., Risk Assessment for Food Allergy, Allergen Management in the Food Industry, John Wiley & Sons, Inc., Hoboken, New Jersey, 2010; 421-51.
19. Prevalence of Food Allergy in Europe, EFSA supporting publication 2013:EN-506, University of Portsmouth, 2013.
20. Scot H, Sicherer, MD, and Hugh A. Sampson, MD., Food allergy: A review and update on epidemiology, pathogenesis, diagnosis, prevention and management. Journal of Allergy and Clinical Immunology, 2018; 141(1): 41–58.
21. Pereira B, Venter C, Grundy J, Clayton C B, Arshad S H, Dean T. Prevalence of sensitization to food allergens, reported adverse reactions to foods, food avoidance, and food hypersensitivity among teenagers. J Allergy Clin Immunol, 2005; 116(4): 884–92.
22. The Consumer, Health and Food Executive Agency, TNS European Behavior Studies Consortium,

ec.europa.eu/food/.../labelling_legislation_study_food-info-vs-cons-decision_2014.

23. Corrine A. Keet, MD, MS, PhD, and Katrina J, Allen, MD, PhD., Advances in food allergy in 2017, 2018; 142(6): 1719-1729.
24. De Blok B.M,J., Dubois A.E.J,, Groningen, Hourihane J.O' B. Impact of food allergies on quality of life, Managing allergens in food, Woodhead Publishing Limited, 2007; 733-737.
25. Guidelines relating to the provision of information on substances or products causing allergies or intolerances as listed in Annex II of Regulation (EU) No 1169/2011 on the provision of food information to consumers
26. Zrnić M, Stanković I, Đorđević B, Zakonska regulisanost deklarisanja i označavanja hrane u zemljama EU i Srbiji, Univerzitet u Beogradu, Farmaceutski fakultet, Katedra za bromatologiju, Simpozij „ Hranom do zdravlja“ 2014.

Enclosure 1: QUESTIONNAIRE – FOOD ALLERGENS

Remark: Please put X next to selected answers.
Please feel free to write at the end of questionnaire all that you consider to be important for your allergy.
The goal of survey is to determine frequency of food allergy in Sarajevo Canton. The data from survey are anonymous and will not be used for any other purposes.

1	Name and surname:		
2	Gender:	M F	
3	Year of birth:		
4	Do you have any allergy?	Yes No	
5	You are allergic to:	Food Medicines Pollen Sun Other _____	
6	Are you allergic to food?	Yes No	
7	Which foodstuff are you allergic to?	Cereals containing gluten Dairy products Eggs Peanut Nuts Fish Mollusks Crustaceans	Soy Sesame seed Mustard Celery Lupine Sulfur dioxide and sulphites Other, mention _____
8	How long does it take from allergen intake to occurrence of allergy symptoms?	Up to 15 min Up to 30 min Up to 60 min Longer _____	
9	Have you been in hospital due to food allergy?	Yes No	
10	Have you been diagnosed allergy to some food by any method?	Yes No	
11	In which way were you diagnosed food allergy?	Skin test Blood test Diagnosis by doctor based on your symptoms	
12	Do other members of your family have any type of allergy?	Yes No	
13	If you are allergic to food, do you check contents on food articles?	Yes No	
14	If you are not allergic, do you check contents on food articles?	Yes No	
15	Are you satisfied with allergen labeling on declaration?	Yes No	
16	Using scale 1-5, please describe to which extent allergy impacts quality of your life	Insignificant; Existing but I manage to cope with it; Existing; Often I have problems; I am always worried because of it	
Other remarks:			

Vol. 45 (2020) No. 3 TIMOK MEDICAL GAZETTE Original papers

SCREEN TIME AND EXTRACURRICULAR SPORTS PARTICIPATION AMONG CHILDREN IN A LOCAL COMMUNITY IN SERBIA

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SUMMARY: **Introduction:** There is evidence that higher levels of screen time are associated with various negative effects on children's health. On the other hand, amounts of physical activity greater than 60 minutes provide additional health benefits. The aim of our study was to compare screen time and participation in extracurricular sports activities between two groups of adolescents in Inđija. **Materials and methods:** A cross-sectional study was conducted in a Primary Healthcare Center Inđija. 200 students participated, of which 100 fifth grade elementary schoolstudents and 100 first grade secondary school students. Data were collected by means of a questionnaire, which was designed for this study. **Results:** In our study 200 of students participated, of which 41% were boys. Secondary school students ignored the recommendations for daily screen time significantly more than elementary school students, on workdays (χ^2=28.06, p<0.01), and at weekends (χ^2=40.996, p<0.01). Elementary school students participated in extracurricular sports significantly more than secondary school students (χ^2=5.225, p<0.05). High school boys participated in extracurricular sports considerably more than high school girls (χ^2=16.234, p<0.01), and elementary school girls also participated more than high school girls (χ^2=7.966, p<0.05). **Conclusion:** This research showed that more than half of the students in Inđija ignored the recommendations for screen time on workdays and at weekends, high school students considerably more than elementary school students. Approximately forty percents of the students did not participate in extracurricular sports. Elementary school students participate in extracurricular activities significantly more than secondary school students, with significant decline in high school girls.

Keywords: adolescents; sedentary habits; digital media; screen time; extracurricular sports activities; physical activity

INTRODUCTION

Independent of physical activity levels, sedentary habits are associated with increased risk of cardio-metabolic disease, all-cause mortality, and a variety of physiological and psychological problems [1]. The issue of screen time for children being online, while still debated, is out-of-date. This is because there is no clear agreement on when the time spent on digital technology goes from moderate to excessive; 'how much is too much' is highly individual, depends on the child's age, individual characteristics and broader life context [2]. The American Academy of Pediatrics has recommended no more than two hours of screen time for children and teenagers for extracurricular activities [3]. But children and youth spend more than 7 h per day using media; the vast majority of them have access to television in the bedroom, access to a computer, the Internet, a video-game console, and a cell phone [4]. There is evidence that higher levels of screen time are associated with various negative effects on the health of children and youth, with the evidence for adiposity, unhealthy diet, depressive symptoms and quality of life being the strongest [5]. Recent evidence raises concerns about media's effects on aggression, sexual behavior, substance use, disordered eating, and academic difficulties [3]. In order to improve cardiorespiratory and muscular fitness, bone health, and cardiovascular and metabolic health biomarkers of children, those aged 5–17 should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily [6]. One of the voluntary global targets for prevention and control of non-infectious diseases to be attained by 2025 is 10% relative reduction in prevalence of insufficient physical activity [7].

The aim of our study was to compare screen time and participation in sports activities between two groups of adolescents in Inđija.

METHODS

Study design and setting: A cross-sectional study was conducted in Primary Healthcare Center "Dr Milorad Mika Pavlovic", Inđija in the period September 2018-September 2019. Inđija is a town and a municipality located in the Srem District of the autonomous province of Vojvodina, Serbia. Per 2011 census, the town has the total population of 26,025, while the municipality has 47,433 inhabitants [8]. Primary HealthcCare Centers' Pediatric Department had approximately 6870 medical records of children aged 1-18 in the study period.

Data collection and variables. Participation in the study was voluntary. 200 students participated, of which 100 fifth grade elementary school students and 100 first grade secondary school students. Data were collected by means of a questionnaire, which was designed for this study. Participants filled the questionnaire when they were at the pediatrician examination. Fifth grade children (younger than fifteen) were with their parents who had given their consent for participation. First grade secondary school children consented to participate in the study. Daily screen time for extracurricular activities longer than 2 hours was considered ignoring the recommendations. Students who went in for extracurricular sport trainings for more than six months before the study started were considered sports participants.

Statistical methods. The results are presented by the method of descriptive statistics and the differences between the groups were calculated by chi-square test. P-value of <0.05 was considered significant.

RESULTS

Out of all 200 participants, 118 (59%) were girls, and 82 (41%) were boys. In the elementary school students group 56% were girls, and in the secondary school students group 62% were girls. There were not significant gender differences between these two groups.Mean age in the group of elementary school students was 10,64, and in the group of secondary school students 14.76.

115 (57.5%) of all children on workdays and 111 (55.5%) at weekends ignored the recommendations for screen time. Daily screen time among secondary school and elementary school students is presented in Table 1 and Table 2. Gender differences and differences between screen time on workdays and at weekends in both groups individually did not reach statistical significance. Secondary school students spent significantly more time in front of screens (> 2h daily) for extracurricular activities both on workdays (χ^2=28.06, p<0.01), and at weekends (χ^2=40.996, p<0.01) than elementary school students. Secondary school girls spent more time in front of screens than elementary school girls both on workdays (χ^2=15.246, p<0.01), and at weekends (χ^2=10.384, p<0.01). Secondary school boys spent more time in front of screens than elementary school boys both on workdays (χ^2=15.5, p<0.01), and at weekends (χ^2=21.5, p<0.01)

Table 1. Screentime daily – secondary school students

Screen time secondary school	< 2h		> 2h		Total N
	N	%	N	%	
Workdays	24	24.0	76	76.0	100
Weekends	22	22.0	78	78.0	100
Workdays girls	16	28.6	40	71.4	56
Workdaysboys	8	18.2	36	81.8	44
Weekends girls	16	28.6	40	71.4	56
Weekends boys	6	13.6	38	86.4	44

Table 2. Screentime daily - elementary school students

Screen time elementary school	< 2h		> 2h		Total N
	N	%	N	%	
Workdays	61	61.0	39	39.0	100
Weekends	67	67.0	33	33.0	100
Workdays girls	40	64.5	22	35.5	62
Workdays boys	23	60.5	15	39.5	38
Weekends girls	36	58.0	26	42.0	62
Weekends boys	24	63.2	14	36.8	38

Out of all participants, 84 (42%), 50 (50%) of secondary school students and 34 (34%) of elementary school students did not participate in extracurricular sports activities (Table 3 and Table 4). Secondary school boys participated in extracurricular sports considerably more than secondary school girls (χ^2=16.234, p<0.01). Gender differences for extracurricular sports participation between elementary school students did not reach statistical significance. Elementary school students participated significantly more in extracurricular sports than secondary school students (χ^2=5.225, p<0.05). Elementary school girls participated in extracurricular sports considerably more than secondary school girls (χ^2=7.966, p<0.05). There was no significant difference in sports participation between boys .

Table 3. Extracurricular sports participation - secondary school students

Sports- secondary school	Yes		No		Total (N)
	N	%	N	%	
All	50	50.0	50	50.0	100
Girls	18	32.1	38	67.9	56
Boys	32	72.7	12	27.3	44

Table 4. Extracurricular sports participation - elementary school students

Sports- elementary school	Yes		No		Total (N)
	N	%	N	%	
All	66	66.0	34	34.0	100
Girls	36	58.0	26	42.0	62
Boys	28	73.7	10	26.3	38

DISCUSSION

Computer use, video games and ownership of devices, such as tablets and smart phones, occurs at an increasingly young age. Screen time, television viewing, in particular, has been negatively associated with the development of physical and cognitive abilities, and positively associated with obesity, sleeping problems, depression and anxiety [9]. Recent research by the Institute of Public Health of Serbia shows that 57.8% of students in the 5th, 7th grade of elementary school and the 1st grade of secondary school spend more than two hours a day watching television on weekdays. There is a significantly higher percentage of boys of the same age, who play games for more than two hours a day during workdays and at weekends [10]. In our study no significant gender

differences were present in both groups individually, 5th grade of elementary school and the 1st grade of secondary school children, across screen time per day. But secondary school students ignored the recommendations for daily screen time significantly more than elementary school students, gender differences between elementary and secondary school students did reach statistical significance.

Physical activity and body mass index are strongly linked from childhood to adulthood, the relationship between these gets increasingly higher with age and therefore it is important to establish healthy habits early to prevent obesity in later life. Studies have shown that physical activity, sports and participation in sports competitions decline during adolescence, especially in girls [11]. While physical activity levels decline drastically during adolescence, levels of screen time increase considerably [12]. Our research shows that in our two groups elementary school students participate in extracurricular sports activities significantly more than secondary school students, with a significant decline in secondary school girls.

Promoting physical activity and a healthy diet might prove a better strategy than merely reducing screen time to decrease harmful effects of screen time on the health of children and youth. Some studies have shown that parental rules regarding screen time and participation in physical activity play a role in the amount of screen time among children and adolescents, concluding that programs that encourage limit-setting by parents and promote physical activity may reduce screen time among youth [13]. Screen time was also associated with poor attachment to parents and peers in adolescents [14]. Therefore, anticipatory guidance for healthy behavioral changes should be focused on the family. Parents should recognize and understand their own roles in modeling appropriate media use and balance between media time and other activities [15]. To maximize health benefits, approaches to resolve the inactivity crisis should attempt to both increase deliberate physical activity and decrease sedentary behaviours, especially in the pediatric population [16].

There were several limitations that need to be considered in interpreting these results. We collected our data by means of a questionnare which was designed for this study, but our results were easy to interpret and to compare with other studies. We also have a moderate sample of this two uniform groups of students.At first, the strenght of our study could be considered through the research work in primary healthcare. The method of this study could be the basis for larger studies with more participants included.

CONCLUSIONS

This research showed that more than half of the students in Inđija ignored the recommendations for screen time on workdays and at weekends, secondary school students considerably more than elementary school students. Approximately forty percents of the pupils did not participate in extracurricular sports. Elementary school students participate significantly more than secondary school students, with significant decline in secondary school girls. In the future some public programs should be focused on students of these two groups (5th - 8th grade of elementary school) to prevent decline in sports activities among high school students resulting in screen time increase.

Conflict of interest: None declared.

REFERENCES

1. Katzmarzyk PT, Church TS, Craig CL, Bouchard C. Sitting time and mortality from all causes, cardiovascular disease, and cancer. Med Sci Sports Exerc. 2009; 41(5): 998-1005. doi:10.1249/MSS.0b013e3181930355
2. UNICEF. The State of the world's children 2017. Children in a Digital World. 2017.
3. Strasburger VC, Hogan MJ, Mulligan DA, Ameenuddin N, Christakis DA, Cross C, et al. Children, adolescents, and the media. Pediatrics. 2013; 132(5): 958–61.
4. Strasburger VC, Jordan AB, Donnerstein E. Health effects of media on children and adolescents. Pediatrics. 2010; 125(4): 756-767. doi:10.1542/peds.2009-2563
5. Stiglic N, Viner RM. Effects of screentime on the health and well-being of children and adolescents: a systematic review of reviews. BMJ Open. 2019;9(1):e023191. doi:10.1136/bmjopen-2018-023191)
6. WHO. Global Strategy on Diet, Physical Activity and Health [Cited 2020. June 7th]. Available from: https://www.who.int/dietphysicalactivity/factsheet_young_people/en/
7. World Health Organization. Global Status Report on Noncommunicable Diseases. WHO. 2014. [cited 2020/06/07]; Available from:

http://www.who.int/nmh/publications/ncdstatus-report-2014/en/

8. 2011 Census of Population, Households and Dwellings in the Republic of Serbia: Comparative Overview of the Number of Population in 1948, 1953, 1961, 1971, 1981, 1991, 2002 and 2011, Data by settlements. Statistical Office of Republic Of Serbia, Belgrade.2014. Available from: http://pod2.stat.gov.rs/ObjavljenePublikacije/Popis2011/Knjiga20.pdf
9. Domingues-Montanari S. Clinical and psychological effects of excessive screen time on children. J Paediatr Child Health. 2017; 53(4): 333-338. doi:10.1111/jpc.13462
10. IZJZ Srbije „ Dr Milan Jovanović Batut". Rezultati istraživanja ponašanja u vezi sa zdravljem dece školskog uzrasta u Republici Srbiji 2018.godine. Beograd; 2019.
11. Alberga AS, Sigal RJ, Goldfield G, Prud'homme D, Kenny GP. Overweight and obese teenagers: why is adolescence a critical period? Pediatr Obes. 2012; 7(4): 261–73.
12. Currie C, Zanotti C, Morgan A, et al. (2012) Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: International report from the 2009/2010 survey. Available at: http://www.euro.who.int/en/health-topics/Life-stages/child-and-adolescent-health/publications/2012/social-determinants-of-healthand-well-being-among-young-people.-healthbehaviour-in-school-aged-children-hbsc-study
13. Carlson SA, Fulton JE, Lee SM, Foley JT, Heitzler C, Huhman M. Influence of limit-setting and participation in physical activity on youth screen time. Pediatrics. 2010; 126(1): e89-e96. doi:10.1542/peds.2009-3374
14. Richards R, McGee R, Williams SM, Welch D, Hancox RJ. Adolescent screen time and attachment to parents and peers. Arch Pediatr Adolesc Med. 2010; 164(3): 258-262. doi:10.1001/archpediatrics.2009.280)
15. Reid Chassiakos YL, Radesky J, Christakis D, Moreno MA, Cross C; COUNCIL ON COMMUNICATIONS AND MEDIA. Children and Adolescents and Digital Media. Pediatrics. 2016;138(5):e20162593. doi:10.1542/peds.2016-2593
16. Tremblay MS, LeBlanc AG, Kho ME, et al. Systematic review of sedentary behaviour and health indicators in school-aged children and youth. Int J Behav Nutr Phys Act. 2011; 8: 98. doi:10.1186/1479-5868-8-98

Vol. 45 (2020) No. 3 TIMOK MEDICAL GAZETTE Case report

PARANEOPLASTIC SYNDROME AS A POSSIBLE CAUSE OF PULMONARY THROMBOEMBOLISM IN A FEMALE PATIENT WITH NEPHROTIC SYNDROME -CASE REPORT

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SUMMARY: A 59-year-old female patient was admitted to the hospital due to suffocation, lower leg swelling, and general weakness. She had been treated previously with immunosuppressive therapy for several years because of focal segmental glomerulosclerosis with nephrotic syndrome. The expected therapeutic response was not accomplished. Upon admission, the following were determined in the laboratory: hypoalbuminemia, hyperlipidemia and nephrotic range proteinuria. X-ray of the lungs showed bilateral pleural effusion, because of which a pleural puncture was performed and which drained 800 mL of fluid. Tumor markers test, breast echosonography and mammography were performed, along with bone scintigraphy, which was done upon the recommendation of an oncologist. Mammography described microcalcifications bilaterally while bone scintigraphy showed pathological accumulation of radiopharmaceuticals in the V thoracic vertebra and sternum corpus, and III and IV ribs on the left. On the fifth day of hospitalization, there was a deterioration of patient's general condition with hypotension, tachycardia and angina, as well as an increase in D-dimer. On the ECG sinus rhythm, f 80 / min, low voltage in standard and unipolar leads. Upon the recommendation of a cardiologist, CT was performed according to the program for pulmonary thromboembolism (PTE), which showed submassive PTE. Low molecular weight heparin therapy was used, along with oxygen therapy with dopaminergics, bronchodilators, human albumin and plasma infusions, statins and transient treatment of hypervolemia by means of hemodialysis. The patient was hospitalized for 61 days due to multiorgan dysfunction. Breast magnetic resonance imaging was not performed due to the poor general condition of the patient. Most likely it was breast cancer with secondary deposits, which was recognized late. PTE, as a probable consequence of paraneoplastic nephrotic syndrome, was diagnosed and treated in a timely manner.

Key words: nephrotic syndrome; pulmonary thromboembolism; paraneoplastic syndrome

INTRODUCTION

Pulmonary thromboembolism is a vascular disease that occurs as a complication of venous thrombosis and a thrombus breaking loose and reaching the lungs through circulation. The clinical picture also depends on the degree of occlusion and the number of affected pulmonary arteries (massiveness of the embolism). Annual frequency is 2-3 / 1000 inhabitants. The most common embolizations are proximal DVT 40%, VCS - 10-20%, distal DVT - 20-30%, upper extremities (CVC). Risk factors: trauma, orthopedic surgery (particularly hip and knee), major abdominal, thoracic, gynecological surgeries, vein surgery, cardiovascular diseases accompanied by cardiac decompensation and arrhythmias, septic conditions, long-term immobilization, childbirth, autoimmune diseases, as well as malignant diseases (pancreatic, breast, prostate and bronchus cancer).

CASE REPORT

Material used from the patient's medical history, medical data from the hospital information system KIS-UCC of Republika Srpska, patient's letter of discharge from UCC of Republika Srpska.

Results: The patient had a positive family history of malignant diseases and a significant weight loss. Objectively of cachectic appearance. Cor: Heart action rhythmic, fast, tones quieter, no noise, TA 120 / 70mmHg. Pulmo: Ausculatory over the lungs bilaterally diminished respiratory murmur. DE: Mutual pretibial edema.

Laboratory findings:

- Haematologic parameters: Leukocytes $14{,}3x10^9$/L0; Erythrocytes $4{,}43x10^{12}$/L;

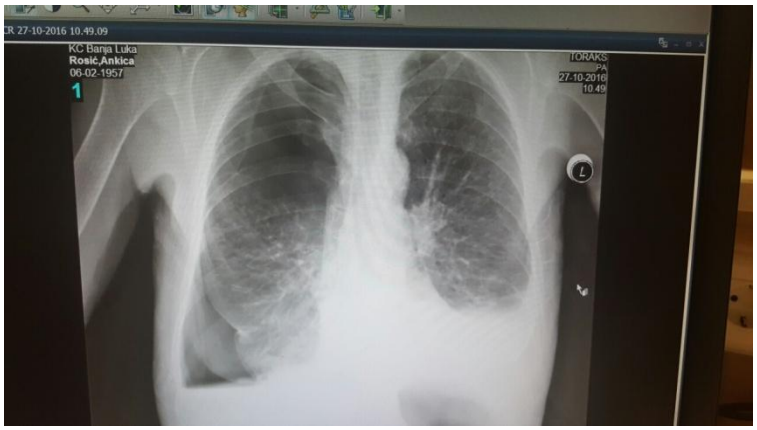
Haemoglobin 137 g/L, Thrombocytes 528 x 10^9/L;

- Byochemical basic parameter: AST 38 U/L, ALT 26 U/L, LDH 300 U/L;, total serum proteins 41 g/L, albumins 21 g/l, cholesterol 4,6 mmol/l, triglycerids 3,9mmol//L,
- Cardio-byomarkers: CK 84 U/L; CK-MB 19 U/L; TnT 69,7; D-dimer 8,93;
- Blood Nitrogen substances and creatinine clearance: urea 11,9mmol/L, creatinin 101 ɥmol/l (eGFR by formula Cockcroft: 41,7ml/min, MDRD 51,7 ml/1,73m^2/min), uric acid 317 ɥmol/l,
- Serum electrolytes and acid-base status parameters: K 3,7, Ca 2,12, Na 140, Cl 100, P 0,94, ASTRUP: pH 7,482, cHCO3 26,8, ABE 3,6.
- Urine analysis: albumin+++, erythrocytes. 3-4; leukocytes: 6-10; BIURET 4,3 g/24h
- Tumor markers: CA 125: 586, CA 15-3: 98, CA 19-9: 1,2, CYFRA 21-1 2,8, CEA: 9,4, NSE: 9,4, HE4 241,5: , ROMA 90,7%.
- Hormone status: TSH 2,75; FT4 17,75; Thyroglobulin: 41,91; calcitonin 0,694;

We conclude that the patient had thrombocytosis, grade III renal insufficiency, normal mineral status, hypoproteinemia and hyperlipidemia, nephrotic range proteinuria, metabolic alkalosis, and elevated tumor markers for the breast and genital tract. Gynaecology ultrasound findings were normal. On the fifth day of hospitalization, the patient's clinical condition sharply deteriorated. as problems, she reported suffocation, chest tightness and dry cough. Objectively dyspnoeic at rest with central cyanosis present, tachycardic heartbeat, quieter tones, no murmur, TA 80 / 60mmHg. ECG showed sinus rhythm, f 80 / min, low voltage in standard and unipolar leads. Oxygen therapy was administered, Dobutamine 5mcg / kg / min (250mg Dobutamine in 250mL 0.9% NaCl), Clexane 0.6 ml 1x1 s.c; blood was taken for D dimer and cardiospecific enzymes.

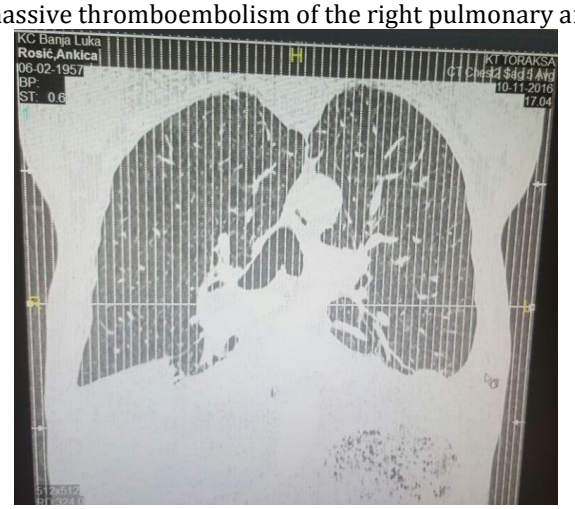
Chest X-ray reveals bilateral pleural effusion (pleural effusion) to the level of the V rib as well as an encapsulated effusion in the projection of the lower lung field to the right (Figure 1).

Figure 1. Chest X-ray (X-ray of the heart and lungs) shows bilateral pleural effusion up to V rib as well as encapsulated effusion in the projection of the lower lung area to the right

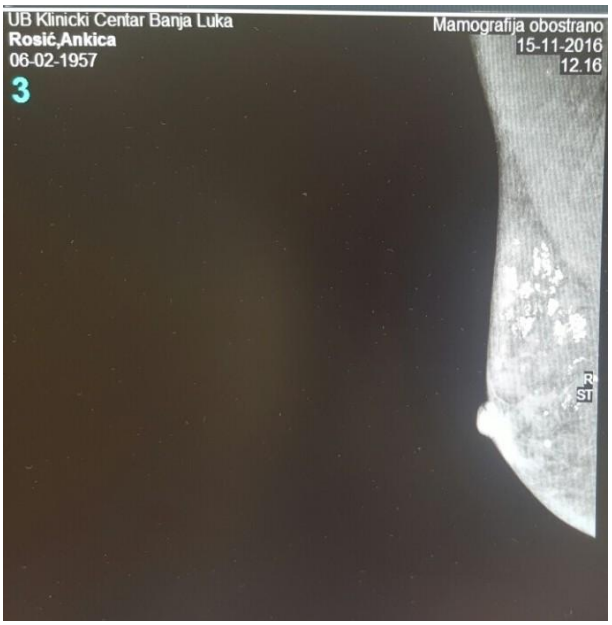


Computed tomography of the thorax (CT) according to the PTE program showed submassive thromboembolism of the right pulmonary artery (Figure 2). The defect in the lumen is differentiated - thromboembolism of the branch of the right pulmonary artery for the upper lung lobus with extension into segmental branches for the anterior segment as well as incomplete thrombosis of the intermediate branch of the right pulmonary artery. Pulmonary artery tree width 23mm, right pulmonary artery 21mm, left pulmonary artery 18mm. There is no consolidation or infiltration in the parenchyma shown. Posterobasal pleural effusion right about 5 cm wide, left up to 6 cm with consequent compressive atelectasis of the basal segments of the lower lung lobes.

Figure 2. Chest CT according to the PTE protocol:
submassive thromboembolism of the right pulmonary artery



Figures 3. and 4. Native mammography of both breasts and the axillary region: Bilaterally prepectoral and more pronounced in the right breast, multiple intraductal segmental calcifications are observed, completely filling the ducts. Among these amorphous calcifications, multiple individual microcalcifications of suspected malignant characteristics are observed



DISCUSSION:

Malignant tumors affect the body locally: by their mass, by infiltrative growth, by destruction of local tissue, by compression, through necrosis, bleeding, secondary infections. By systemically secreting hormones and other substances, they affect distant organs and systems or consume building material and energy. Paraneoplastic syndrome is a group of clinical disorders associated with a malignant disease and which are not a result of direct physical effects of the primary tumor or a metastatic disease [1]. It exists in 10-20% of patients, primarily in small cell lung, breast, ovarian cancer, and in malignant lymphomas; clinical manifestations differ. It is not related to the size of the primary tumor, it may occur late in the evolution of the disease or it may be the first sign of disease

recurrence. The exact mechanism of occurrence of paraneoplastic syndrome is not clear, it is assumed to be related to the production of biologically active substances by tumors (polypeptide hormones and cytokines) or the production of antibodies. Paraneoplastic syndrome includes nonspecific metabolic and endocrine manifestations of a tumor.

Symptoms and signs of paraneoplastic syndrome may be:

- **Systemic**: anorexia, cachexia, weight loss, fever, orthostatic hypotension.
- **Dermal**: acquired palmoplantar keratoderma, pemphigus vulgaris, pruritus.
- **Neurological**: peripheral neuropathy, encephalopathy, necrotizing myelopathy, cancer-associated retinopathy, vision loss, visceral neuropathy.
- **Endocrinal and metabolic**: nonmetastatic hypercalcemia, secretion of parathyroid-like hormone (more common in squamous cell carcinoma, microcellular carcinoma 10%), Sy. Cushing, hypercorticism (microcellular carcinoma 1.6-4.5%), the syndrome of inappropriate secretion of antidiuretic hormone, gynecomastia and galactorrhea, excessive secretion of gonadotropic hormone, carcinoid syndrome, hyperthyroidism, hyper and hypoglycemia, hypophosphatemia, hypouricemia.
- **Renal**: glomerulonephritis, tubulointerstitial disease.
- **Haematological**: anemia, leukocytosis and eosinophilia, leukemoid reaction, thrombocytosis and thrombocytopenic purpura.
- **Coagulopathies**: hypercoagulability, Troussean syndrome (more common in adenocarcinoma), thrombophlebitis, disseminated intravascular coagulopathy.
- **Collagen vascular**: dermatomyositis, polymyositis, vasculitis, systemic lupus erythematosus.
- **Bone and joint**: digiti hyppocratic, pulmonary hypertrophic osteoarthropathy (more common in adenocarcinoma).

The literature gives the nephrotic syndrome as a direct cause of thromboembolism due to loss of antithrombotic factors through urine and increased production of prothrombotic factor in the liver [2].

Hemodialysis patients have twice the incidence of pulmonary thromboembolism than patients without renal disease, and hemodialysis patients have a higher incidence of PTE than patients on peritoneal dialysis [3]. Vascular access infection, septic condition and use of temporary and permanent central venous catheters for hemodialysis contribute to this.

CONCLUSION:

The incidence of pulmonary thromboembolism has been underestimated due to unreliable clinical picture, diagnosis, and insufficiently accurate tests which would confirm clinically suspected PTE. What is required here is a multidisciplinary approach to the treatment because the real incidence is ten times higher than estimated. The patient most likely had breast cancer with secondary deposits but one which was detected late. PTE as a probable consequence of paraneoplastic nephrotic syndrome was timely diagnosed and treated.

Timely detection of the underlying disease, better survival and patients' better quality of life are possible through good cooperation of cardiologists, nephrologists, oncologists and pulmonologists.

REFERENCE:

1. Bilynsky BT, Dzhus MB, Litvinyak RI. The conceptual and clinical problems of paraneoplastic syndrome in oncology and internal medicine. Exp Oncol: 2015; 37 (2): 82-88.
2. Al-Azzawi HF, Obi OC, Safi J, Song M:Nephrotic syndrome-induced thromboembolism in adults. Int J Crit Illn Inj Sci. 2016; 6(2): 85–88.
3. Wang IK, Shen TC, Muo CH, Yen TH, Sung FC: Risk of pulmonary embolism in patients with end-stage renal disease receiving long-term dialysis, Nephrol Dial Transplant. 2017; 32(8): 1386-1393. Available from: https://doi.org/10.1093/ndt/gfw272

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ANDRIJA ŠTAMPAR - FOUNDER OF THE YUGOSLAV PUBLIC HEALTH SERVICE AND YUGOSLAV AMBASSADOR TO THE WHO

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SUMMARY: Andrija Štampar was born in 1888 in the village of Brodski Drenovac in Slavonia, and died in 1958 in Zagreb. He was a Yugoslav and Croatian doctor and scientist most deserving of founding public health and social medicine in the Balkans in the first half of the 20th century. He graduated from the Medical Faculty in Vienna in 1911 with a doctorate in general medicine. Even as a medical student, he wrote articles and pamphlets with the goal of educating and enlightening people about prevention and maintaining health. He began his professional career working as a municipal doctor in Nova Gradiška, and from 1919 to 1930 he worked as the head of the hygiene department of the Ministry of Public Health in Belgrade, and in that period he worked on founding a health service in the former Yugoslavia. He organized more than 250 public institutions important for health work. With his dedicated and tireless work, he tried to establish a doctor as a public and social worker and a national teacher and educator, who is economically independent and equally accessible to all strata of society. He emphasized the importance of preventive medical work. From 1930, his more significant engagement at the international level began. He works as a hygiene expert at the League of Nations in many European countries, in the USA and in China, where he is credited with the reform of the health service. He spent the years of World War II as a detainee in a prison in Graz. After his release, he continued to work in the field of public health and science, as the director of the School of Public Health, dean of the Faculty of Medicine, rector of the University of Zagreb, memeber and president of the Yugoslav Academy of Sciences and Arts JANU (1947-1958). Along with a rich professional career in the country, he achieves notable successes in the organization of the public health service and in the world. He has been working on the founding of the World Health Organization since 1946, and after writing its constitution in the summer of 1948, he chaired the first Assembly of this highest health body in the world in Geneva.

Keywords: History of medicine; Faculty of Medicine-Zagreb; Faculty of Medicine-Belgrade; Yugoslavia; public health; social medicine

Andrija Štampar was born more than 130 years ago in a small Slavonian village (Croatia) in the area of the Austro-Hungarian monarchy. His father was a teacher, and because of his service, the family often moved. So Stampar had a lot of time to observe the everyday life of ordinary people. At that time, there were no doctors or medical services in the villages in the Balkans. We are talking about the backward society of peasants immersed in ignorance, which had great negative consequences for the health of the people. From 1898 to 1906 he attended the Gymnasium in Vinkovci, which he finished as an excellent student. He began his medical studies in 1906 in Vienna, then the most important medical center in the world [1]. He completed them in just 5 years and 2 months, on December 23, 1911. While a student, he published over 70 articles and brochures, mostly aimed at health education, and gave a series of public lectures in Vienna and his homeland. Most importantly, however, it was during this period that he formed his clear views on social medicine. He was simply a man who knew exactly what he wanted, and at the same time energetic, persistent, uncompromising, self-confident [2]. In 1909, in Nova Gradiška, he founded his own journal called the Public Health Library, in which he wrote articles on numerous topics on health and disease prevention. After finishing his studies, Dr. Štampar was first employed in Karlovac, and then he was transferred to Nova Gradiška and promoted to municipal doctor [3]. During World War I, he worked as a doctor in a prison camp in Mathausen, Austria [2]. After the

end of the war, as one of the few highly educated people in the newly formed state of the Kingdom of Serbs, Croats and Slovenes, he was appointed a health advisor in the Social Welfare Commission of the National Council in Zagreb [4]. In 1919, he gave a lecture on children's health at the Congress of Allied Countries on Social Hygiene in Paris. Even then, he clearly showed that he has a clear concept of organizing a public health service [3].

As a man of such a rich reputation, even then, in May 1919, he began his career in Belgrade. Dr. Milan Jovanović Batut, then an old renowned doctor in Belgrade, recognized the talent and interest in social medicine and hygiene in the young Štampar. That is why, at the age of only 31, Štampar manages to get a job in the Ministry of Public Health, and that would not be any job, but an assistant minister, that is. Head of the Department of Racial, Public and Social Hygiene. His quote with which he appeared before Batutum is well-known: "I have no personal acquaintances or friends here, I make no oral or written recommendations." But Batut won with his mature thinking and deep conviction about the values of health for the human community [2].

With the limited material and logistical resources at his disposal, in a newly formed country, poor, backward, composed of various peoples and nationalities and different geographical areas, devastated after the recently ended wars (Balkan and World War I), with a population tormented by hunger and diseases, burdened with social problems, and with insufficient doctors and medical staff, Štampar took on the task of organizing a health service. It was just a challenge for him [2].

However, with great personal commitment and enthusiasm, he managed in the first 5 years in the position of the Ministry of Public Health until 1924 to establish as many as 250 social and medical institutions throughout the then Kingdom of Serbs, Croats and Slovenes: from public health homes and health stations, through bacteriological and antimalarial stations, tuberculosis dispensaries, sexually transmitted diseases clinics, school polyclinics, institutions for infants and young children, all the way to the Central Hygiene Institute in Belgrade and the Hygiene Institute with the School of Public Health in Zagreb. At the same time, he worked on training the missing health staff - schools for nurses were established in Zagreb, Belgrade, Ljubljana and Skopje. The program of the Medical Faculty in Belgrade and Zagreb includes classes in social medicine and hygiene. Guided by his ideal of public enlightenment, Štampar, within the School of Public Health, organized an innovative so-called "Peasant University", within which multi-month seminars on health issues in rural areas are held [1,2,4].

Following his ideal, prof. Dr. Andrija Štampar created advanced medicine, based on evidence whose only purpose was to serve the people. However, as his ideals at the time were characterized as social democratic and leftist in the early 1930's he came into conflict with the government. In 1931, therefore, he failed to obtain the consent of the authorities for the election to the title of full professor of hygiene and social medicine at the Medical Faculty in Zagreb [2].

Therefore disappointed, he turns to the fight for public health at the international level. From 1931 to 1933 he worked as a full-time member of the Health Organization of the League of Nations. He is engaged in a completely new, but also close to him job, education of health personnel. Traveling through Europe, as a visiting professor, he lectures at medical faculties and schools in the Netherlands, Spain, Greece, Poland, Hungary, and Germany. He also visits the United States and Canada as a guest of the Rockefeller Federation. In 1938, he gave numerous lectures at renowned medical schools throughout the United States, such as Harvard and the University of California, where he worked as a professor during 1938/39. He also visited China, where from 1933 to 1936 he remained as an advisor to the Chinese government and worked on organizing health services after the catastrophic floods of 1931 [1,2,3,4,5].

Picture number 1. Andrija Štampar (on the right) in Lanchow, China, in 1930's [6]

After the political changes in the then Kingdom of Yugoslavia, Štampar returned to Zagreb in 1939, where his election as a full professor of hygiene and social medicine was finally confirmed. As the most mature and most experienced teacher, he was elected dean of the Medical Faculty in Zagreb the following year, and thus dedicated himself to reforming teaching within the medical profession. This fruitful work was soon interrupted again by the German invasion of Yugoslavia in 1941. Immediately after the establishment of the Ustasha regime, Štampar was arrested and once again, as politically unfit, was interned in a camp in Graz, where he was liberated in 1945 [2].

After returning to his homeland, in May 1945, he again took over the professorship, the Faculty of Medicine, the University of Zagreb and the administration of the School of Public Health. Then the successes in his professional career in the newly formed communist Yugoslavia are reduced. In 1947, he became an academician and a regular member of the Yugoslav Academy of Sciences and Arts, whose president he would be until his death in 1958 [2].

As well as at home, Štampar is also successful at the international health level in the world after World War II. What is perhaps the most important achievement of Andrija Štampar is his key role in the formation of the World Health Organization [1]. In 1946, the development of an international health organization within the United Nations began. In 1946, he was elected the first vice-president of the UN Economic and Social Council and the president of the Provisional (Interim) Commission, which performed the duty of that organization until the ratification of the constitution of the World Health Organization [3]. Within this commission, Štampar himself has the task of preparing a constitutional act of the future World Health Organization, known as the "Magna Carta of Health" and famous for its idealistic definition of health. "Health is a state of complete physical, mental and social well-being illness and exhaustion. " [1]. In the period from 1945 to 1948, he chaired all the sessions of this international health body. Then, at a session from June 24 to July 24, 1948 in Geneva, chaired by Stampar, as an anonymously elected president, the Constitution was adopted, which was drafted by a commission under his leadership, and the World Health Organization was established [3]. The printer remained active in the World Health Organization, dedicated to promoting and advancing the health of the world's population until his death on June 26, 1958 [1].

Picture number 2. The Interim Commission met in Geneva in 1946. From left, Dr Štampar, a president to the commission [6]

At the eighth regular session of the World Health Organization in 1955 in Mexico City, Andrija Štampar was awarded the recognition of the Leon Bernard Foundation for all work and achievements in the field of public health and social medicine [3].

Today, the work of prof. Dr. Andrija Štampara has not been forgotten both in his homeland and in the world. In the Republic of Croatia, the University of Zagreb awards an annual prize to individuals and organizations for their scientific results, promotion of science and profession, and transfer of knowledge and education of young experts in the field of biomedical sciences named after this famous professor [7]. Every year, the European Association of Schools of Public Health awards a prestigious recognition at a regular meeting, which is also named after Andrija Štampar for his achievements in the field of public health [8].

SUMMARY

Life and work of prof. Dr. Andrija Štampara are extremely important for the young generations of doctors and scientists from this area. Despite various economic and political turmoils and obstacles in the hilly Balkans, his diligent work, perseverance and dedication led Dr. Stampar to unprecedented successes in the international health field. Dr. Štampar even twice created a health service in his homeland out of nothing. His ideology was a belief in the primary social role of health and in the possibility of improving it with social and medical measures, because, as he said more than once, "everyone has the right to health" [2].

Conflict of interest: Dušan Kuljancic- None.

LITERATURE:

1. Brown TM, Fee E. Andrija Stampar: charismatic leader of social medicine and international health. Am J Public Health. 2006;96(8):1383. doi:10.2105/ AJPH.2006.090084
2. Dugački V., Žižak M., 2020. Medicinski fakultet Zagreb | Andrija Stampar - STUDMEF. [online] stariweb.mef.hr. Available:http://stariweb.mef.hr/studmef/znanost/ucimo-znanost/andrija-stampar-2.html [Accessed 25.10.2020.].
3. En.wikipedia.org. 2020. Andrija Štampar. [online] Available from:https://en.wikipedia.org/wiki/Andrija_%C5%A0tampar#cite_ref-HE_1-3 [Accessed 25.10.2020.]
4. Štampar, Andrija. Hrvatska enciklopedija, mrežno izdanje. Leksikografski zavod Miroslav Krleža, 2020. Available from:http://www.enciklopedija.hr/Natuknica.aspx?ID=59892 [Accessed 25.10.2020.].
5. Grmek MD, ed. Serving the Cause of Public Health: Selected Papers of Andrija Stampar. Zagreb, Yugoslavia: Medical Faculty of the University of Zagreb; 1966:16.
6. Croatia.org. Zagreb, 2020. Andrija Stampar, Croatian Scientist, Father Of The World Health Organization. [online] Available from:http://www.croatia.org/crown/articles/9595/1/Andrija-Stampar-is-the-father-of-the-World-Health-Organization.html [Pristupljeno 25.10.2020.].
7. Konecki, M., 2020. Nagrada Andrija Štampar. [online] Unizg.hr. Available from:http://www.unizg.hr/istrazivanje/istrazivanje-i-inovacije/nagrade-za-posebna-postignuca/nagrada-andrija-stampar/ [Accessed 25.10.2020.].
8. Aspher.org. 2020. ASPHER - ANDRIJA STAMPAR MEDAL. [online] Available from:https://www.aspher.org/andrija-stampar-medal.html [Accessed 25.10.2020.].

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The text of the paper contains first and foremost the title of the paper, in the following lines: full names of the authors and all co-authors; the name, place and address of the institutions from which the author and co-authors come (in parentheses, associate the names of the authors); possibleacknowledgementfor help with elaborationofthe paper;

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Show the **results** (with the subtitle of the same name in BOLD) clearly and concisely. You should not display the same data both in tables and charts.

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Organization as author:

WHO collaborative study team on the role of breastfeeding on the prevention of infant mortality. Effect of breastfeeding on infant and child mortality due to infectious diseases in less developed countries: a pooled analysis. Lancet. 2000; 355: 451–5.

No authors listed:
Coffe drinking and cancer of the pancreas [editorial]. BMJ. 1981; 283 628.

A volume with a supplement:
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Books and other monographs

The author is a person (s):
Carlson BM. Human embryology and developmental biology. 3rd ed. St. Louis: Mosby; 2004.

Editor (s) as authors:
Brown AM, Stubbs DW, editors. Medical physiology. New York: Wiley; 1983.

Chapter in a book:
Blaxter PS, Farnsworth TP. Social health and class inequalities. In: Carter C, Peel JR, editors. Equalities and inequalities in health. 2nd ed. London: Academic Press; 1976. p. 165–78.

Meeting announcements: Harris AH, editor. Economics and Health: 1997: Proceedings of the 19th Australian Conference of Health Economists; 1997 Sep 13-14; Sydney, Australia. Kensington, N.S.W.: School of Health Services Management, University of New South Wales; 1998.

Conference Articles:
Anderson JC. Current status of chorion villus biopsy. In: Tudenhope D, Chenoweth J, editors. Proceedings of the 4th Congress of the Australian Perinatal Society; 1986: Brisbane, Queensland: Australian Perinatal Society; 1987. p. 190-6.

Dissertation:
Cairns RB. Infrared spectroscopy studies of solid oxygen. Dissertation. Berkley, California: University of California, 1965.

Electronic material

Article in aninternetmagazine:
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Article published electronically before the printed version:
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CD-ROM:
Anderson SC, Poulsen KB. Anderson's Electronic Atlas of Hematology [CD-ROM]. Philadelphia: Lippincott Williams & Wilkins; 2002.

Online monograph:
Foley KM, Gelband H, editors. Improving palliative care for cancer [monograph on the Internet]. Washington: National Academy Press; 2001 [cited 2002 Jul 9]. Available from: http://www.nap.edu/books/0309074029/html/.

Website:
Cancer-Pain.org [homepage on the Internet]. New York: Association of Cancer Online Resources, Inc.; c2000-01 [updated 2002 May 16; cited 2002 Jul 9]. Available from: http://www.cancer-pain.org/.

Part of awebsite:
American Medical Association [homepage on the Internet]. Chicago: The Association; c1995-2002 [updated 2001 Aug 23; cited 2002 Aug 12]. AMA Office of Group Practice Liaison; [about 2screens]. Available from: http: //www.ama-assn.org/ama/pub/category/1736.html

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TIMOČKI MEDICINSKI GLASNIK

TIMOK MEDICAL GAZETTE

REČ AUTORA

Prim Dr Sci Petra Paunovića, epidemiolog, spec. socijalne medicine i zdravstvenog vaspitanja, učitelj zdravlja

U „Priručniku o prevenciji i lečenju KOVID 19 infekcije“, a Priručnik je napisan na osnovu kliničkog iskustva Liang Tingo-a, napisano je sledeće:

„Nalazimo se u globalnom ratu bez presedana! Čovečanstvo se suočava sa zajedničkim neprijateljem, novim korona virusom. Prvo bojno polje su upravo bolnice, gde su vojnici naši zdravstveni radnici.

Da bi obezbedili pobedu u ovom ratu, moramo najpre da budemo sigurni da naše medicinsko osoblje ima dovoljno resursa, uključujući iskustvo i tehnologiju. Takođe, moramo da stvorimo uslove da bolnice budu bojno polje na kome ćemo eliminisati virus, umesto da virus pobedi nas.

Ovaj rat je tek počeo“.

U našu zemlju su došli kineski lekari. U sastavu njihove ekipe nije bilo epidemiologa. Iz prethodnih reči Liang-a se vidi strategija borbe sa KOVID-om u Srbiji 2020. godine. Ta strategija je primenjivana do kraja. Naša epidemiološka doktrina je bila izostavljena. Naša preventiva skoncentrisana u Istitutima i Zavodima za javno zdravlje zbog toga je imala sporednu ulogu u suzbijanju epidemije korona virusa u Srbiji. Ionako potpuno destruirana tokom poslednje dve decenije, ona je pretrpela još jedan udar od kojeg će se teško oporaviti.

U Rajcu, juna 2020. godine,
Dr Petar Paunović, učitelj zdravlja