SEPTEMBER 2018 | VOL. 3 | NO. 3 ISSN 2451–4691

DISASTER AND EMERGENCY MEDICINE JOURNAL

VIA MEDICA

WWW.VIAMEDICA.PL

Konferencja pod patronatem
Łódzkiego Oddziału
Towarzystwa Internistów Polskich

ŁÓDŹ
13 kwietnia 2019 roku

FORUM INTERNISTÓW 2019

Szczegółowe informacje oraz rejestracja:

www.foruminternistow.viamedica.pl

ORGANIZATOR

VIA MEDICA

PATRONAT MEDIALNY

tvmed

PARTNER

ikamed.pl
internetowa księgarnia medyczna

18-0183.001.011

Konferencja jest skierowana do wszystkich osób zainteresowanych tematyką. Sesje satelitarne firm farmaceutycznych, sesje firm farmaceutycznych oraz wystawy firm farmaceutycznych są skierowane tylko do osób uprawnionych do wystawiania recept lub osób prowadzących obrót produktami leczniczymi — podstawa prawna: Ustawa z dnia 6 września 2001 r. Prawo farmaceutyczne (Dz.U. z 2008 r. nr 45, poz. 271).

DISASTER AND EMERGENCY MEDICINE JOURNAL

www.journals.viamedica.pl/disaster_and_emergency_medicine

■ **Disaster and Emergency Medicine Journal** (ISSN 2451–4691) is published by VM Media sp. z o.o. VM Group sp.k., Grupa Via Medica, ul. Swietokrzyska 73, 80–180 Gdansk, tel: (+48 58) 320 94 94, fax: (+48 58) 320 94 60, www.journals.viamedica.pl/disaster_and_emergency_medicine

■ **Editorial Address:** VM Media sp. z o.o. VM Group sp.k., Via Medica Group, ul. Swietokrzyska 73, 80–180 Gdansk, tel: (+48 58) 320 94 94, fax: (+48 58) 320 94 60, www.journals.viamedica.pl/disaster_and_emergency_medicine

■ **Advertising:** For details on media opportunities within this journal please contact the advertising sales department ul. Swietokrzyska 73, 80–180 Gdansk, tel: (+48 58) 320 94 57, e-mail: dsk@viamedica.pl
The Editors take no responsibility for the published advertisements.

Disaster and Emergency Medicine Journal is indexed in CrossRef, Polish Medical Bibliography (PBL), ROAD and Ulrich's Periodicals Directory.

Editorial policies and author guidelines are published on journal website: www.journals.viamedica.pl/disaster_and_emergency_medicine

Legal note: www.journals.viamedica.pl/disaster_and_emergency_medicine/about/legalNote

DISASTER AND EMERGENCY MEDICINE JOURNAL

www.journals.viamedica.pl/disaster_and_emergency_medicine

TABLE OF CONTENTS

VIA MEDICA

ORGINAL ARTICLE

Disaster and Emergency Medicine Journal
2018, Vol. 3, No. 3, 71–74
DOI: 10.5603/DEMJ.2018.0017

ISSN 2451–4691

THE INFLUENCE OF ALCOHOL RELATED ACCIDENTS ON HEALTH CARE COST

Bulut Demirel[1], Mehmet Ergin[2], Ayhan Özhasenekler[2], Cahit Teke[2], Fatih Tanrıverdi[2], Gülhan Kurtoğlu Çelik[2], Alp Şener[1], Gül Pamukçu Günaydın[1], Şervan Gökhan[2]

[1]Ankara Atatürk Education and Research Hospital, Department of Emergency Medicine, Ankara, Turkey
[2]Ankara Yıldırım Beyazıt University Atatürk Education and Research Hospital, Department of Emergency Medicine, Ankara, Turkey

ABSTRACT

INTRODUCTION: Road traffic accidents are globally leading causes of mortality and morbidity. Alcohol is among the most frequently used pleasure-inducing substances in the world. Use of motor vehicle under the influence of alcohol is completely illegal in some countries. However, it is allowed up to a certain level of ethanol in blood in other countries. Traffic accidents caused by alcohol consumption are known to cause more harm on health of individuals. The alcohol affects nervous system. Alcohol slows reflexes and impairs balance. In other words, alcohol intake reduces capability of individuals while using any motor vehicle. This study aims to search the health care cost of individuals who had traffic accidents under the influence of alcohol.

METHODS: This present study included 657 patients who were admitted to the E.R. resulting from traffic accidents between the dates 01.01.2017–01.06.2017. Demographic information of the patients, their time of hospital admission, medical analyses and examinations, the cost of those analyses and examinations, and their ethanol levels were recorded.

RESULTS: 657 patients were included in the study. 460 (68.1) of those patients were males. Their age average was 35.57 ± 15.18. 61 (9.0%) of the patients were seen to have ethanol positive blood. The health care expenditures of ethanol positive patients were found to be 374,75 ± 251,3 TL whereas the expenditures of ethanol free patients were identified to be 283,17 ± 222,72 TL. The health care expenditures of ethanol positive patients were seen to have substantially increased. (p = 0,003).

CONCLUSIONS: Alcohol intake is known to be a leading cause of traffic accidents that generally results in deaths and heavy injuries. This present study displays that traffic accidents caused by alcohol consumption increases the cost of health care as well.

KEY WORDS: alcohol, traffic, accident, health care, cost

Disaster Emerg Med J 2018; 3(3): 71–74

INTRODUCTION

Traffic accidents are one of the biggest public health care problems in the world [1]. Every year, traffic accidents cause death of 1.24 million people. The number of injured people is approximately 40–50 million. Traffic accidents account for the eighth cause of mortality of individuals aged between 15 and 29 [2]. The injuries caused by traffic accidents constitute a lifelong burden on the health care system [3]. Consumption of alcohol and psychoactive substances and non-use of protective equipment (head guard, seat belt etc.) are factors that increase fatal-

ADDRESS FOR CORRESPONDENCE:
Bulut Demirel; e-mail: bulutdemirel@gmail.com, tel: +905313013169

ity of traffic accidents, duration of hospitalization and health care expenditures. Among the pleasure inducing substances, alcohol is the major cause of severe and fatal traffic accidents. Previous studies showed that blood alcohol level between 0.5 g/L and 0.7 g/L (a little more of legal limit in Turkey) caused traffic accidents more than 4–10 times. The same study displayed that blood alcohol level between 0.2 g/L and 0.4 g/L caused traffic accidents more than 2–5 times. It is obvious that even little changes of alcohol levels in blood cause traffic accidents at increasing levels [4, 5]. For that reason, low alcohol level in blood is recommended [6].

According to the 2016 data, more than 1 million 182 thousand traffic accidents took place in Turkey. Although most of those accidents had financial loss, 7300 people lost their lives (3800 people died after hospitalization) and nearly 304 000 people got injured [7]. However, the literature has the limited knowledge of accidents resulted from alcohol intake and the health care cost of those accidents. This present study aims to evaluate patients/injured people who were admitted to E.R. because of traffic accidents in terms of their ethanol levels, demographic features and cost on health care system. It is a fact that the risk of accident occurrence while using motor vehicle after alcohol consumption is much higher than usually. This condition is important not only for motor vehicle users, but also for those who use any vehicle in traffic. Alcohol related accidents have more severe and heavier results than accidents caused by other factors. For that reason, those accidents necessitate hospital interventions that will cover both trauma and the effects of alcohol on body. We investigated the effect of alcohol consumption on the health care cost.

METHODS

The study included over 18 patients after traffic accidents who were admitted to the E.R. of a tertiary healthcare service between the dates 01.01.2017––01.06.2017. Patients' blood ethanol level, demographic features, admission time and health care cost were recorded. The parameters were analyzed with SPSS for Windows 15.0 version. In descriptive statistics of continuous variables, average was stated with standard deviation; categorical variables were stated with numbers and percentages. For categorical variables, significance of difference between the groups was evaluated with Q-Square Test. In the analysis of normally distributed parameters, parametric tests were used. Non-parametric tests were used in not normally distributed parameters. In comparison of binary groups, Mann Whitney U test was used. $P < 0.05$ value was accepted to be statistically significant.

RESULTS

657 patients were included in the study. 460 (68.1) of those patients were male. Their age average was 35.57 ± 15.18. 61 (9.0%) of the patients had ethanol positive blood. 47 (77.0%) of the ethanol positive patients were male. 413 (67.3%) of the ethanol free patients were male. Ethanol level status was similar in both genders ($p = 0.118$). Age range was also similar in both genders ($p = 0,198$). The health care cost of the ethanol positive patients was 374,75 ± 251,3 TL whereas the cost of ethanol free patients was 283,17 ± 222,72 TL. The cost of ethanol positive patients was seen to increase substantially ($p = 0,003$). Table 1 shows patients' demographic parameters, admission time and health care cost.

Age groups of the patients are displayed in the Table 1 as well. The expenditures are seen to increase with age ($p < 0,001$). There was a weak positive correlation between the cost and the age ($p < 0,001$, $r = 0,163$).

DISCUSSION

Global struggle of World Health Organization (WHO) with alcohol addiction has not been as successful as their struggle with tobacco. Both alcohol and tobacco consumptions are still global health problems [8]. According to the WHO data, alcohol is associated with homicide, violence, theft, rape and traffic accidents [9]. Use of motor vehicle under the influence of alcohol and other psychoactive substances is the most frequently seen human cause of traffic accidents [10]. Alcohol and psychoactive substances reduce capability of using any motor vehicle [11, 12]. Although it is tried to be hindered with a certain legal limits, some problems associated with measurements and individual differences are confronted [13]. The use of alcohol with other addictive substances causes worse results [14]. Reduced capability of using a motor vehicle due to those substances and non-use of protective equipment result in traffic accidents with high mortality rates and heavy injuries [15–17].

Table 1. Demographic parameters, health care cost and admission time of patients					
		All Patients	Ethanol (+)	Ethanol (-)	p
Cost; avg. ± s.d.		291,45 ± 226,78	374,75 ± 251,30	283,17 ± 222,72	0,003
Age; avg. ± s.d.		35,57 ± 15,18	33,18 ± 12,02	33,18 ± 12,02	0,198
Age Groups; n (%)					
	0–18 age	25 (%3,7)	–	25 (%4,1)	
	19–25 age	193 (%28,5)	21 (%34,4)	172 (%28)	
	26–45 age	306 (%45,3)	32 (%52,5)	274 (%44,6)	
	46–65 age	116 (%17,1)	6 (%9,8)	110 (%17,9)	
	Over 65	35 (%5,1)	2 (%3,3)	33 (%5,4)	
Gender; n (%)					0,118
	Female	215 (%31,8)	14 (%23)	201 (%32,7)	
	Male	460 (%68,1)	47 (%77)	413 (%67,3)	
Admission time; n (%)					
	00:00–07:59	202 (%29,9)	26 (%42,6)	176 (%28,7)	
	08:00–15:59	245 (%36,2)	15 (%24,6)	230 (%37,5)	
	16:00–23:59	228 (%33,7)	20 (%32,8)	208 (%33,9)	

The patient group that is most affected by traffic accidents is aged between 18 and 49. The stated reason for this is that this age group is mostly unwilling to obey traffic rules, speed limits and other traffic regulations [18, 19]. In the first decade of their lives, people live their fastest period. People whose age is between 20 and 40 tend to have more traffic accidents because of using motor vehicles more recklessly [20–22]. This present study includes 499 patients (79, 75%) aged between 18 and 45, which is compatible with the literature. Hospital admissions after traffic accidents show intensity between 00.00–08.00 hours, which results from alcohol consumption generally at night hours. The distribution of genders in traffic accidents caused by alcohol show similarity, which is opposite to the general idea that mostly males use alcohol and females use vehicles more carefully [23, 24]. A study done on university students showed that alcohol consumption was frequent at night and disturbed sleep caused attention deficiency at chronic period, which is a cause of traffic accident [25]. This present study is compatible with this literature. The literature showed that alcohol related traffic accident victims cost more to the health care system when compared to the cost of the victims after non-alcohol related accidents [26]. This literature does not include traffic accidents of pedestrians and cyclists [27, 28]. Another study showed that in addition to financial burden of those alcohol caused traffic accidents to the health care system, those cases resulted in longer hospitalization periods at E.R. [29]. Our study also showed that alcohol related traffic accidents cost more to healthcare system. Nearly one-tenth of the patients were identified to have ethanol positive blood. Even if this rate seems to be low at first sight, a full-scale study which examined improper overtaking, exceeding the speed limits and sleeplessness showed that the use of motor vehicle after alcohol intake caused accidents with more fatality and heavy injuries and financial damage [30]. This decile rate had higher mortality and morbidity rates compared to the other reasons, which should be taken into consideration [25].

This present study is a pilot study that was done in a very short time, which can be counted as one of the limitations of our study. Additionally, the study does not include factors such as socio-economic status which affects health care cost and use of protection equipment during the accidents. Patients who lost their lives at the scene of the accidents also have a health care cost. However, this is a study that merely centered on emergency admissions.

Authors declare no conflict of interest. No funding was used by authors.

CONCLUSIONS

Among the pleasure-inducing substances, alcohol is the most frequently used one. Alcohol has a variety of consumption in various cultures. It is known to be a leading cause of traffic accidents. This present

study showed that traffic accidents caused by alcohol had higher health care cost.

REFERENCES

1. Özen E, Genç E, Kaya Z. Awareness of Traffic Accidents and Thoughts on Traffic and Traffic: The Case of Uşak Province. 2014.
2. Peden M, Scurfield R, Sleet D, et al. World report on road traffic injury prevention. World Health Organization Geneva. 2004.
3. Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study. Lancet. 1997; 349(9064): 1498–1504, doi: 10.1016/S0140-6736(96)07492-2, indexed in Pubmed: 9167458.
4. Heifer U. Blood alcohol concentration and effect, traffic medicine characteristics and legal traffic relevance of alcohol limit values in road traffic. Blutalkohol. 1991; 28(3): 121–145, indexed in Pubmed: 1867841.
5. Phillips DP, Brewer KM. The relationship between serious injury and blood alcohol concentration (BAC) in fatal motor vehicle accidents: BAC = 0.01% is associated with significantly more dangerous accidents than BAC = 0.00%. Addiction. 2011; 106(9): 1614–1622, doi: 10.1111/j.1360-0443.2011.03472.x, indexed in Pubmed: 21689195.
6. Karakus A, İdiz N, Dalgiç M, et al. Comparison of the effects of two legal blood alcohol limits: the presence of alcohol in traffic accidents according to category of driver in Izmir, Turkey. Traffic Inj Prev. 2015; 16(5): 440–442, doi: 10.1080/15389588.2014.968777, indexed in Pubmed: 25375366.
7. TÜİK. Turkey Statistic Institution, Road Traffic Accident Statistics. 2016, 2017.
8. Aydın S. Global strategies in the struggle against alcohol from the WHO. Health and Medical Culture Journal. 2011(12).
9. Varol M. Alcohol Report. Istanbul: Turkey Green Crescent Society. 2011.
10. Petridou E, Moustaki M. Human factors in the causation of road traffic crashes. Eur J Epidemiol. 2000; 16(9): 819–826, indexed in Pubmed: 11297224.
11. Movig KLL, Mathijssen MPM, Nagel PHA, et al. Psychoactive substance use and the risk of motor vehicle accidents. Accid Anal Prev. 2004; 36(4): 631–636, doi: 10.1016/S0001-4575(03)00084-8, indexed in Pubmed: 15094417.
12. Elvik R. Risk of road accident associated with the use of drugs: a systematic review and meta-analysis of evidence from epidemiological studies. Accid Anal Prev. 2013; 60: 254–267, doi: 10.1016/j.aap.2012.06.017, indexed in Pubmed: 22785089.
13. CANTÜRK G. Medico-Legal Issues in the Detection of Blood Alcohol. Turkish Clinics, Journal of Forensic Medicine-Special Topics. 2017; 3(2): 125–30.
14. Alcohol, drugs and traffic safety. Accident Analysis & Prevention. 1982; 14(6): 490–492, doi: 10.1016/0001-4575(82)90070-7.
15. Shih HC, Hu SC, Yang CC, et al. Alcohol intoxication increases morbidity in drivers involved in motor vehicle accidents. Am J Emerg Med. 2003; 21(2): 91–94, doi: 10.1053/ajem.2003.50025, indexed in Pubmed: 12671806.
16. Tien HCN, Tremblay LN, Rizoli SB, et al. Association between alcohol and mortality in patients with severe traumatic head injury. Arch Surg. 2006; 141(12): 1185–91; discussion 1192, doi: 10.1001/archsurg.141.12.1185, indexed in Pubmed: 17178960.
17. Orsay EM, Turnbull TL, Dunne M, et al. Prospective study of the effect of safety belts on morbidity and health care costs in motor-vehicle accidents. JAMA. 1988; 260(24): 3598–3603, indexed in Pubmed: 3193590.
18. Lugo LH, García HI, Cano BC, et al. Multicentric study of epidemiological and clinical characteristics of persons injured in motor vehicle accidents in Medellín, Colombia, 2009-2010. Colomb Med (Cali). 2013; 44(2): 100–107, indexed in Pubmed: 24892455.
19. Gotsens M, Marí-Dell'Olmo M, Pérez K, et al. Other MEDEA Members. Trends in socio-economic inequalities in injury mortality among men in small areas of 26 Spanish cities, 1996-2007. Accid Anal Prev. 2013; 51: 120–128, doi: 10.1016/j.aap.2012.10.020, indexed in Pubmed: 23207841.
20. Boström L, Wladis A, Nilsson B. A review of serious injuries and deaths among car occupants after motor vehicle crashes in Sweden from 1987 to 1994. Arch Orthop Trauma Surg. 2001; 121(1-2): 1–6, indexed in Pubmed: 11195103.
21. El-Sadig M, Norman JN, Lloyd OL, et al. Road traffic accidents in the United Arab Emirates: trends of morbidity and mortality during 1977-1998. Accid Anal Prev. 2002; 34(4): 465–476, indexed in Pubmed: 12067109.
22. Sharma BR, Harish D, Sharma V, et al. Road-traffic accidents--a demographic and topographic analysis. Med Sci Law. 2001; 41(3): 266–274, doi: 10.1177/002580240104100311, indexed in Pubmed: 11506352.
23. DeJoy DM. An examination of gender differences in traffic accident risk perception. Accid Anal Prev. 1992; 24(3): 237–246, indexed in Pubmed: 1605809.
24. Buzrul S. Alcohol Consumption in Turkey. Journal of Food and Health Science. 2016: 112–122, doi: 10.3153/jfhs16012.
25. Montazeri A. Road-traffic-related mortality in Iran: a descriptive study. Public Health. 2004; 118(2): 110–113, doi: 10.1016/S0033-3506(03)00173-2, indexed in Pubmed: 15037040.
26. Gómez-Restrepo C, Naranjo-Lujan S, Rondón M, et al. Costs of health care and influence of alcohol in traffic accidents in Bogota-Colombia. Journal of clinical epidemiology. 2016.
27. Homma Y, Yamauchi S, Mizobe M, et al. Emergency department outpatient treatment of alcohol-intoxicated bicyclists increases the cost of medical care in Japan. PLoS One. 2017; 12(3): e0174408, doi: 10.1371/journal.pone.0174408, indexed in Pubmed: 28329002.
28. Kuendig H, Hasselberg M, Laflamme L, et al. Alcohol and nonlethal injuries: a Swiss emergency department study on the risk relationship between acute alcohol consumption and type of injury. J Trauma. 2008; 65(1): 203–211, doi: 10.1097/TA.0b013e318068fc64, indexed in Pubmed: 18580530.
29. Akay N, Çelik GK, Karakayalı O, et al. The Effects of Blood Alcohol Levels on Injury Severity and Cost in Motor Vehicle Accidents. Ankara Medical Journal. 2014; 14(1).
30. Alp S, Engin T. Analysis and evaluation of the relationship between causes and consequences of traffic accidents by using topsis and ahp methods. Istanbul Ticaret Üniversity, Science Faculty Journal. 2011; 19(10): 65–87.

VIA MEDICA

ORGINAL ARTICLE

Disaster and Emergency Medicine Journal
2018, Vol. 3, No. 3, 75–81
DOI: 10.5603/DEMJ.2018.0018

ISSN 2451–4691

THE EVALUATION OF PEDIATRIC FORENSIC CASES PRESENTED TO EMERGENCY DEPARTMENT

Atiye Kübra Ökçesiz[1], Nalan Kozaci[2], Mustafa Avci[2], Bulut Demirel[3]

[1]Isparta State Hospital, Department of Emergency Medicine, Isparta, Turkey
[2]University of Health Science, Antalya Education and Research Hospital, Department of Emergency Medicine, Antalya, Turkey
[3]Halil Şıvgın Çubuk State Hospital, Deparment of Emergency Medicine, Ankara, Turkey

ABSTRACT

INTRODUCTION: Pediatric age group serves as a preparation stage for the rest of the life. This age group has specific psychological, physiological and social conditions. This present study examined pediatric forensic cases aged between 0–18. Obtained parameters determined characteristics of pediatric age group forensic cases.

METHODS: 1624 pediatric forensic cases aged between 0–18 who were admitted to the emergency department at a tertiary healthcare service between the dates 31 October 2014 and 31 October 2016 were evaluated retrospectively. The cases were evaluated in terms of age, gender, nationality, admission time and season, reasons for presentation, radiological imaging techniques, consultation, intervention, treatment ward, clinical outcome and application of cardiopulmonary resuscitation.

RESULTS: Age average of the patients was 9,2 ± 6,2. Adolescent age group (49, 4%) was the most frequently admitted after traumatization. 61% of the patients constituted male patients. An association between age and gender was not detected. The most frequent reasons for admissions were assault (28,7%) and drug intoxication (22,4%). Assault, drug intoxication, traffic accidents, substance intake, penetrating stab wounds, falling down from the height and animal bites were frequently seen in adolescents whereas simple falling, corrosive substance ingestion and burn were highly seen in infants. Assault, penetrating stab wounds and gunshot injuries were detected to be frequent in males; drug and substance use was seen to be frequent in females. The patients (57%) were seen to be admitted to the emergency between the hours 16^{00}–24^{00}. 46.4% of the patients underwent radiological imaging. Trauma patients were seen to undergo radiological imaging more frequently. A consultation was required for 42.4% of the patients. The discharge rate of the patients from the emergency was 66.9%. Patients discharged from the emergency were seen to undergo radiography and computed tomography directly. This was found to be significantly high.

CONCLUSIONS: Pediatric forensic cases are seen in adolescence and school-age children more frequently. The most frequent forensic cases were assaults and intoxications. Forensic cases are more frequently seen in males. Assaults are more frequent in males whereas intoxications are more frequent in females. Most of the forensic cases are discharged from the emergency department. Patients discharged from the emergency undergo radiological imaging at higher rates compared to the other patients.

KEY WORDS: Trauma, child, forensic cases, radiological imaging

Disaster Emerg Med J 2018; 3(3): 75–81

ADDRESS FOR CORRESPONDENCE:
Bulut Demirel; e-mail: bulutdemirel@gmail.com, tel: +905313013169

INTRODUCTION

Pediatric age group has a specific physiology, pathology and sociology and serves as a preparation period for future. Although legal pediatric age groups are differently identified in many countries, UN declaration of the rights of the child describes pediatric age group as patients below the age of 18 years [1]. Healthcare staff should know that the pediatric age group is not a counterpart of adult patients. Pediatric age groups may display different behaviors, diseases, and stages. Traumatization mechanisms and surfaces show variations in those age groups [2]. This makes the management of this age group more difficult as it has various physiologies.

Every kind of problem which pediatric age groups encounter may affect their future life. This includes not only social and psychological problems but also health problems [3]. Predictably, social and psychological destructions in health problems are mostly seen in forensic cases [4]. A forensic case occurs when physical and psychological health problems are developed with the role of intent, negligence or inattention of another person [5]. Forensic cases are challenging so admission, notification, medical examination, protection and report of evidence necessitate a specific process [6]. Among the major forensic cases that doctors are obligatory to report are assaults, injuries, traffic accidents, labor accidents, intoxications, substance use, burns, electric shocks, asphyxia, omission and abuse, suicide, or other suspicious cases.

Forensic cases occupy a specific area in the pediatric age group. This situation bears specific difficulties in terms of both socio-physiological and medical aspects. The most frequent reasons for the death of children below 1 year in the USA are traumas. Gunshot deaths are the second cause after traumas in the pediatric age group in Turkey [7]. Mortal traumas are most frequently seen in skull area due to the anatomy of the pediatric age group. Those areas are respectively followed by the thorax and abdomen. Pediatric forensic cases reveal intoxications and involuntary exposures in curious and unaware pre-school children. Age group between 13 and 19 are seen to suffer from committing suicides. [8]. Pediatric age group is physically defenseless and dependent. For that reason, they are prone to be abused [9]. In addition to this, the rate of abuse is high in children called 'fragile child' anomaly, and victims of early period separation of mother and baby. Traumas of non-ambulatory children, mistakes that were done during toilet training, thermal burns resulting from negligence, shaken baby syndrome are among the injuries that belong to the pediatric age group [10].

Most of the pediatric injuries and disease types enumerated above require admissions to any medical health center. Most of the other cases require admissions to the emergency, which unfortunately constitutes the leading reasons for daily emergency department admissions.

Pediatric forensic cases show varieties based on the region and the culture. In spite of many studies, a definite pediatric trauma classification could not have been done. By examining pediatric forensic cases, this present study aims to do situation analysis and enlighten emergency doctor about the difficulties that they may encounter.

MATERIAL AND METHOD

The study included pediatric forensic cases of patients who were admitted to a tertiary health care service between the dates 31 October 2014 and 31 October 2016. The parameters of the patients were examined through the computer database. Non-forensic cases and cases whose forensic reasons were not clarified were excluded from the study. The cases were evaluated in terms of age, gender, nationality, admission time and season, reasons for presentation, radiological imaging techniques, consultation, intervention, treatment ward, clinical outcome and application of cardiopulmonary resuscitation.

4759 forensic cases of patients who were admitted to the emergency department were considered and records of 2007 pediatric forensic cases were examined. 72 non-forensic cases and 311 cases whose forensic reasons could not be determined were excluded from the study. The study included 1624 pediatric cases.

Parameters were analyzed with Statistical Package for the Social Sciences (SPSS) 22.0. The distribution of the parameters was evaluated with Kolmogorov Simonov test. Standard deviation (SD) was used for average in the demonstration of quantitative data. Case number (n) and percentile (%) were used in the demonstration of qualitative data. In the analysis of categorical parameters, Chi-square and Fisher extract tests were used. $P < 0,05$ was accepted to be significant.

FINDINGS

Age and gender parameters of the patients are displayed in Table 1. According to the age groups,

a difference in terms of genders could not be found ($p = 0,171$).

According to the reasons for being the forensic case, the age distributions of the patients are shown in Table 2.

According to the reasons for being the forensic case, the age distribution of the patients is displayed in Table 3.

Forensic cases were examined according to the admission time; assault, drug intoxication, falling, burn and substance intake are seen to be significantly high between the hours 08^{00}–24^{00}. Admissions due to animal bites were seen to be increasing between the hours16^{00}–24^{00}. The frequency of CO intoxications was seen to occur between the hours 24^{00}–08^{00} ($p < 0, 05$).

The frequency of radiological imaging techniques in forensic cases is presented in Table 4.

The study showed that frequency of radiological imaging was significantly high in cases of assaults, simple falling, falling from the height, corrosive substance ingestion, traffic accidents and gunshot injuries ($p < 0,05$). Cases of drug intoxications, burns and animal bites required a significantly low frequency of radiological imaging.

The association of patients' hospital status and forensic cases' types are shown in Table 5.

DISCUSSION

Forensic cases include all the factors that cause psychological and physical problems in individuals. Fo-

Table 1. The patients' age and gender situations

Patient group	n	%	Male n (%)	Female n (%)
Newborn (0–1 month)	7	0,4	5 (0,5)	2 (0,3)
Infant (1–24 month)	254	15,6	152 (15,4)	102 (16,1)
Preschool (2–6 years)	336	20,7	189 (19,1)	147 (23,2)
Schoolchildren (6–11 years)	225	13,9	149 (15,1)	76 (12)
Adolescent (11–17 years	802	49,4	495 (50)	307 (48,4)
Total	1624	100	990 (100)	634 (100)

Table 2.The patients' forensic case type and gender distribution

	Gender		p
	Male n (%)	Female n (%)	
Assault	351 (75,3)	115 (24,7)	< 0,001
Drug intoxication	142 (39)	222 (61)	< 0,001
Simple falling	104 (58,1)	75 (41,9)	0,406
Corrosive substance ingestion	82 (62,6)	49 (37,4)	0,689
Traffic accident	74 (68,5)	34 (31,5)	0,096
Burn	70 (66,7)	35 (33,3)	0,215
Falling down from height	52 (59,8)	35 (40,2)	0,815
Penetrating stab wounds	43 (78,2)	12 (21,8)	0,008
Substance use	12 (35,3)	22 (64,7)	0,002
Electric shock	22 (64,7)	12 (35,3)	0,651
Animal bite	16 (66,7)	8 (33,3)	0,564
Asphyxia	9 (50)	9 (50)	0,338
CO intoxication	5 (50)	5 (50)	0,476
Gunshot injuries	7 (100)	0	0,034
Rape	1 (50)	1 (50)	0,751
Total	990 (100)	634 (100)	

Table 3.Age distributions of forensic case types

	%	Newbornn (%)	Infant n (%)	Preschool n (%)	School child n (%)	Adolescent n (%)	p	Total n(%)
Assault	28,7	0	2 (0,4)	17 (3,6)	80 (17,2)	367 (78,8)	< 0,001	466 (28,7)
Drug intoxication	22,4	1 (0,3)	44 (12,1)	141 (38,7)	16 (4,4)	162 (44,5)	< 0,001	364 (22,4%)
Simple falling	11,0	4 (2,2)	57 (31,8)	41 (22,9)	31 (17,3)	46 (25,6)	< 0,001	179 (11,0%)
Corrosive substance	8,1	1 (0,8)	58 (44,3)	43 (32,8)	10 (7,6)	19 (14,5)	< 0,001	131 (8,1%)
Traffic accident	6,7	0	7 (6,5)	15 (13,9)	31 (28,7)	55 (50,9)	< 0,001	108 (6,7%)
Burn	6,5	1 (1)	54 (51,4)	31 (29,5)	7 (6,7)	12 (11,4)	< 0,001	105 (6,5%)
Falling down from height	5,4	0	21 (24,2)	21 (24,2)	18 (20,6)	27 (31,0)	0,008	87 (5,4%)
Penetrating stab wounds	3,4	0	0	3 (5,5)	6 (10,9)	46 (83,6)	< 0,001	55 (3,4%)
Substance intake	2,1	0	1 (2,9)	1 (2,9)	2 (5,9)	30 (88,2)	< 0,001	34 (2,1%)
Electric shock	2,1	0	5 (14,7)	10 (29,4)	7 (20,6)	12 (35,3)	0,409	34 (2,1%)
Animal bite	1,5	0	0	5 (20,8)	9 (37,5)	10 (41,7)	0,007	24 (1,5%)
Asphyxia	1,1	0	3 (16,7)	6 (33,3)	3 (16,7)	6 (33,3)	0,636	18 (1,1%)
CO intoxication	0,6	0	2 (20)	2 (20)	4 (40)	2 (20)	0,142	10 (0,6%)
Gunshot injuries	0,4	0	0	0	1 (14,3)	6 (85,7)	0,347	7 (0,4%)
Rape	0,1	0	0	0	0	2 (100)	0,726	2 (0,1%)
Total	100	7	254	336	225	802		1624 (%100)

Table 4. The frequency of radiological imaging techniques in forensic cases.

		n	%
Radiological Imaging		754	46,4
Direct radiography		636	39,2
CT		239	14,7
	Brain CT	187	11,5
	Thorax CT	29	1,8
	Abdomen CT	4	0,2
	Vertebral CT	50	3,1
	Orbita CT	6	0,4
	Maxillofacial CT	36	2,2
	Extremity CT	15	0,9
Multiple CT		88	5,4
USG		125	7,7

rensic cases are important health problems in terms of mortality and morbidity. It is apparent that any health problem which develops in the pediatric age group will result in both physiologic and psychological damages in the individual's future health. For that reason, pediatric forensic cases have an importance. Pediatric forensic cases largely vary from country to country even from region to region at 18–43 %. In our study 42,17% of the forensic cases constitute pediatric forensic cases. This is compatible with the literature [11, 12].

The studies in which pediatric forensic cases were evaluated identified the age average as 8,2–9,1 years of age and defined that the frequency of getting injuries increased in preschool age children and school age children. This present study also showed that the age average was similarly 9,2 ± 6,2 and the occurrence of cases was the most frequent in children between 11–17 years of age and preschool children followed [13–15]. The fewest of the cases were detected in newborns. The reason for forensic cases being seen more frequently in this period is that exposure to every kind of environmental dangers increases at adolescence. Individuals of this age are also prone to acquire irresponsible — unthoughtful behaviors from their social environments. Parents may also behave irresponsibly, which will contribute to the negative development of individuals. Preschool children are unaware of the dangers around them, so they are more prone to forensic cases such as intoxications and traumas.

The studies conducted showed that even at different rates males constituted most of the forensic

Table 5. Hospitalization status of forensic cases' types

	Hospitalization status		P
	Discharge n (%)	Hospitalization n (%)	
Assault	463 (99,4)	3 (0,6)	< 0,001
Drug intoxication	104 (28,6)	260 (71,4)	< 0,001
Simple falling	160 (89,4)	19 (10,6)	< 0,001
Corrosive substance ingestion	47 (35,9)	84 (64,1)	0,005
Traffic accident	89 (82,4)	19 (17,6)	< 0,001
Burn	49 (46,7)	56 (53,3)	< 0,001
Falling from the height	45 (51,7)	42 (48,3)	0,002
Penetrating stab wound	43 (79,6)	11 (20,4)	0,071
Substance intake	17 (50)	17 (50)	0,034
Electric shock	22 (64,7)	12 (35,3)	0,780
Animal bite	23 (95,8)	1 (4,2)	0,003
Asphyxia	7 (38,9)	11 (61,1)	0,011
CO intoxication	10 (100)	0	0,026
Gunshot injuries	6 (85,7)	1 (14,3)	0,290
Rape	2 (100)	0	0,320
Total	1086 (100)	538 (100)	

cases. 61% of the cases were male in this present study, which was compatible with the literature. The main reason for this is that male children's plays mostly are based on physical power. Because of the paternalistic structure of our society, girls are less prone to spend time outdoors. Parents tend to monitor their girls more closely while they ignore their boys. For those reasons, trauma rates are higher in males [16].

When pediatric forensic cases were evaluated, male children by 14 years of age were seen to be in forensic cases more frequently. However, female children after 14 years of age were defined to be in more non-traumatic cases [17, 18]. In our study, similar to the literature traumas and drug/substance intake were more frequent in adolescents. Simple falling, corrosive substance ingestion and burn were higher in infants.

Although there were variations in the studies conducted, it was stated that pediatric forensic cases were mostly based on falling and traffic accidents, which were subsequently followed by assaults and intoxications [19]. Traumatization was stated to be more frequent in male children while intoxications were more frequent in female children [20]. In non-traumatic cases, committing intoxications were observed to be more frequent. Physiological and psychological changes are intensive during adolescence. For that reason, experiences of lost or failures may increase the tendency towards committing suicide. In this study, the most frequent reasons for admissions were identified to be assault and subsequently drug intoxications. Assault, drug intake, traffic accident, substance use, penetrating stab wounds, falling from the height and animal bite were frequent at adolescents; falling, corrosive substance ingestion and burns were significantly high in infants. Hospital admissions were seen to be more frequent in males due to assault, penetrating stab wound, gunshot injuries whereas in females frequent reasons for admissions were drug and substance intake. We think that traffic accidents in the region were referred to pediatric trauma centers, so trauma rates were low, which was contrary to the literature. Hospital admissions were frequent for the age range 11–17 years of age. We think that at this period the male age group is prone to violence and girls commit suicide to raise attention of others. Infants are constantly in a struggle for walking or moving. However, their motor/balance functions are not developed well. For this reason, they are prone to falling during their struggle to move and walk. Additionally, cognition of this age group has not been developed yet. States associat-

ed with superego such as curiosity and fear have not developed. This can express in corrosive substance ingestion and animal attacks.

In the studies done, any unity could not be seen among the admission time of the pediatric forensic cases. In the studies where pediatric forensic cases were evaluated it was seen that admission frequency for traffic accidents was in the afternoon, falling cases were in the daytime, physical assaults were at night and committing suicides were after the midnight. Another study stated that male children were admitted to the hospital between the hours 16^{01}–23^{59} more frequently, and that was between the hours 08^{00}–16^{00} for the females. In our study, it was seen that the most frequent admissions were between 16^{00}–24^{00}; assault, drug intoxications, simple falling, burn and substance intake was seen to decrease significantly; admissions due to animal bites were seen to increase between the hours 16^{00}–24^{00}; CO intoxications were frequent between 24^{00}–08^{00}. Considering the time that children stay at home and the heating that is provided with natural gas, solid-fuel and stove are on at night, it is usual to have admissions during the night [21]. Pediatric age groups are usually up during daytime; the ones whose parents work are under the supervision of their babysitters. Inattention of babysitters may cause traumas. Even though traumas develop during the day, fathers are waited for before admitting to a hospital, which delays the admissions to the evening or night hours. We think that daytime trauma frequencies increase since little children are out after school hours and adolescents (apart from school hours) are also out in the evening hours. Some traumas may be recognized late or late admissions may be done by parents after they return home. Committing suicides during the daytime and night may occur for the reason that individuals may have some familial quarrels during the day and night.

In many studies, head and neck traumas were seen to be the most frequent in pediatric trauma cases [22, 23]. Cases may be ignored for the reasons that head/body ratios of the pediatric cases are high, that their bone structures have not been totally developed, that their symptoms show variations, and that especially little children cannot utter their complaints. In a dissertation in which pediatric trauma cases were examined, it was stated that only in 1.7% of the patients any kind of radiological imaging techniques were not applied, the most frequent radiological imaging was direct radiography (97%), subsequently USG (69%) and computed tomography (CT) (43%). In this study, it was seen that the ratio of demand for examination increased in the recent past and CT was demanded even in mild trauma cases (Glasgow Coma Scale: 14,15). In our study, it was seen that 46,4% of the cases underwent radiological imaging, the most frequent radiological imaging was direct radiography, the most frequent CT was brain CT and more than one tomography was taken in the 5.4% of the cases. The frequency of radiological imaging was more than trauma cases. Additionally, it was seen that direct radiography and CT imaging were done in the patients who were discharged from the emergency department. This can be related to the fact that the doctor may avoid malpractice and want to discharge the patient from the emergency department more quickly. It may also be associated with the fact that patients themselves and their relatives insist on radiological imaging. In order to exclude mediastinitis and aspiration of corrosive substance into the lungs, radiography may be required.

Some studies stated that the discharge frequency of pediatric forensic cases from the emergency department could reach the level of 90%, and 4,3%–45% of the patients were generally hospitalized [15, 24]. 10 % of the cases was referred to intensive care unit, 9% was hospitalized in surgical clinics. Hospitalization reason for the cases from the most frequent to the least were reported to be falling (52,7%), traffic accident (19%), burn (15,1%) [25]. In our study, it was seen that 67,6% of the cases was discharged from the emergency department, 22.7% was hospitalized in clinics, 9,1% was referred to the intensive care unit. Traumatic cases and CO intoxications were generally discharged from the emergency department because most of the traumas and CO intoxications were not severe. Intoxications, asphyxia, and burn cases were hospitalized. The reason for hospitalization can be to prevent any development of complications and to observe the patient. The ratio of hospitalizations in our study showed similarity with the ratios in the literature.

The studies reported that the mortality rate of the pediatric forensic cases at the emergency service was 0,14% [25]. The mortality rate in the cases hospitalized was 1.6–9%. They were reported to be traumatic cases [20, 25]. In another study conducted, even though life-threatening cases constituted 7.4% of the admissions, death was not reported

at the emergency department. Mortality rate at the emergency department was detected to be 0.1%. This data is compatible with the literature when only emergency department rates were taken into consideration.

Consequently, forensic cases are frequent in adolescents and school age children. The most frequent forensic cases are assault and intoxications. Forensic cases are more frequent among the males. Assault is frequent in the male group and intoxications are frequent in the female group. Most forensic cases are discharged from the emergency department. Radiological imaging is more frequent for those who were directly discharged from the emergency department.

REFERENCES

1. UNICEF. SpringerReference. doi: 10.1007/springerreference_76086.
2. Schalamon J, v Bismarck S, Schober PH, et al. Multiple trauma in pediatric patients. Pediatr Surg Int. 2003; 19(6): 417–423, doi: 10.1007/s00383-003-0954-0, indexed in Pubmed: 12861420.
3. Ayaz M, Ayaz AB, Soylu N. Psychological assessment in child and adolescent cases. Journal of Clinical Psychiatry. 2012; 15(1): 33–40.
4. Acehan S, Bilen A, Ay MO, et al. Assessment of child abuse and neglect. Archive Source Browsing Journal. 2013; 22(4).
5. Ibiloglu A. Domestic Violence. Psikiyatride Guncel Yaklasimlar — Current Approaches in Psychiatry. 2012; 4(2): 204, doi: 10.5455/cap.20120413.
6. Tuğcu H. Responsibility of the physician in emergency situations. Journal of Clinical Development Special issue of forensic medicine. 2009; 22: 85–8.
7. Control CfD, Prevention. Vital signs: Unintentional injury deaths among persons aged 0–19 years-United States, 2000-2009. MMWR Morbidity and mortality weekly report. 2012; 61: 270.
8. DEMİRCİ Ş, DOĞAN KH, ERKOL Z, et al. Deaths of 0–18 Age Group Between 2001–2006 in Konya. Turkish Clinics Journal of Forensic Medicine and Forensic Sciences. 2007; 4(3): 121–6.
9. Brown J, Cohen P, Johnson JG, et al. Childhood abuse and neglect: specificity of effects on adolescent and young adult depression and suicidality. J Am Acad Child Adolesc Psychiatry. 1999; 38(12): 1490–1496, doi: 10.1097/00004583-199912000-00009, indexed in Pubmed: 10596248.
10. Babaroğlu A. Child psychology and mental health. Ankara: Vize Publishing. 2013.
11. Çınar O, Acar Y, Çevik E, et al. Analysis of forensic cases in the 0–18 years age group that were presented to emergency department. Anatol J Clin Investig. 2010; 4(4): 148–51.
12. Karakus A, Zeren C, Karcioglu M, et al. Assessment of childhood forensic cases and protective measures. Turkish Journal of Forensic Medicine. 2013; 27(2): 100–106, doi: 10.5505/adlitip.2013.03274.
13. Chinda JY, Abubakar AM, Umaru H, et al. Epidemiology and management of head injury in paediatric age group in North-Eastern Nigeria. Afr J Paediatr Surg. 2013; 10(4): 358–361, doi: 10.4103/0189-6725.125448, indexed in Pubmed: 24469487.
14. Astrand R, Undén J, Hesselgard K, et al. Clinical factors associated with intracranial complications after pediatric traumatic head injury: an observational study of children submitted to a neurosurgical referral unit. Pediatr Neurosurg. 2010; 46(2): 101–109, doi: 10.1159/000319006, indexed in Pubmed: 20664236.
15. Cetinel Y, Gulalp B, Karagun O, et al. Pediatric Cases That Composed Temporary Legal Report; Whom? When? Journal of Academic Emergency Medicine. 2013; 12(3): 113–117, doi: 10.5152/jaem.2013.033.
16. Donma MM, Tayfur İ, Erdem MN, et al. Evaluation of gender difference in pediatric trauma patients admitted to the emergency department. 2017.
17. Hon KL, Leung TF, Cheung KL, et al. Severe childhood injuries and poisoning in a densely populated city: where do they occur and what type? J Crit Care. 2010; 25(1): 175.e7–175.12, doi: 10.1016/j.jcrc.2009.06.011, indexed in Pubmed: 19682841.
18. Sümer V, Güler E, Karanfil R, et al. Retrospective evaluation of poisoning cases referred to pediatric emergency department. Turkish Pediatry Archives. 2011; 46(3).
19. Yazar A, Akın F, Türe E, et al. Evaluation of Judicial Cases Involving Pediatric Emergency Clinics. Dicle Medical Journal. 2017; 44(4): 345–53.
20. Duramaz BB, Yıldırım HM, Kıhtır HS, et al. Evaluation of forensic cases admitted to pediatric intensive care unit. Turk Pediatri Ars. 2015; 50(3): 145–150, doi: 10.5152/TurkPediatriArs.2015.2399, indexed in Pubmed: 26568689.
21. Ilano AL, Raffin TA. Management of carbon monoxide poisoning. Chest. 1990; 97(1): 165–169, indexed in Pubmed: 2403894.
22. Trauma and Intentional Injury Characteristics of Pediatric Forensic Cases Applying to Emergency Room. Journal of Clinical and Analytical Medicine. 2016; 7(5), doi: 10.4328/jcam.4302.
23. Embleton DB, Ertoran İ, Özkan A, et al. Evaluation of Mortality and Morbidity in Childhood in Traffic Accidents. Kocatepe Medical Journal. 17(3): 84–8.
24. Demir ÖF, Aydın K, Turan F, et al. Analysis of forensic cases of children applying for emergency services. Turkish Pediatry Archives. 2013; 48(3).
25. Tambay G, Satar S, Kozaci N, et al. Retrospective Analysis of Pediatric Trauma Cases Admitted to the Emergency Medicine Department. Journal of Academic Emergency Medicine. 2013; 12(1): 8–12, doi: 10.5152/jaem.2013.008.

VIA MEDICA

ORGINAL ARTICLE

Disaster and Emergency Medicine Journal
2018, Vol. 3, No. 3, 82–90
DOI: 10.5603/DEMJ.2018.0019

ISSN 2451–4691

EVALUATION OF THE AWARENESS OF THE PHYSICIANS ON NEGLIGENCE AND ABUSE OF THE ELDERLY PATIENTS ADMITTED TO EMERGENCY DEPARTMENT

Saffet Özdemir[1], Burak Katıpoglu[1], Togay Evrın[1], Fatma Akkus Özdemir[2], Eylem Kuday Kaykısız[3], Zamir Kemal Ertürk[4], Sınan Cem Uzunget[1], Atilla Korkmaz[1]

[1] Department of Emergency Medicine, UFuK University Medical Faculty, Dr Ridvan Ege Education and Research Hospital, Ankara, Turkey
[2] Department of Child and Adolescent Mental Health, Ankara Research and Trainig Hospital, Turkey
[3] Bitlis State Hospital, Bitlis State Hospital Department of Emergency Medicine 13000 Bitlis/Turkey, 13000 Bitlis, Turkey
[4] Department of Emergency Medicine, Kırsehir Ahi Evran University Faculty of Medicine, Turkey

Abstract

INTRODUCTION: With the increase in the population of the elderly, the negligence and abuse of the elderly (NAE) is increasing at a great pace. Although the rates of NAE in the elderly admitted to emergency department (ED) is more than the estimated rates, the diagnosis and reporting of such cases are extremely rare. The primary aim of the present study is to evaluate the NAE status in the elderly admitted to ED, the awareness in ED physicians, the attitudes towards these cases and the knowledge levels in this field.

METHODS: An electronic questionnaire form that was used as the data collection tool consisted of 19 questions and 2 sections. To call for participation, the questionnaires used in the study were shared with the ED physicians in an online manner between December 2017 and April 2018. The data were analyzed with the SPSS 23.0 Windows computer program with definitive statistics.

RESULTS: A total of 69.4% of the participants faced NAE and 30% did not report this; 79.8% of the participants stated that they had received training in this field and 9% stated that there was a screening test for the abuse of the elderly. A statistically significant difference was determined between those who received course training in this field and those who received training during medicine faculty education and specialist training.

CONCLUSIONS: In this study, it was observed that the NAE rates were more than the estimated rates in the elderly admitted to ED. It was understood that ED physicians did not have adequate knowledge in this field. A new curriculum is needed for the training and education in this field.

KEY WORDS: elderly and terminally ill, abuse, negligence, emergency medicine.

Disaster Emerg Med J 2018; 3(3): 82–90

INTRODUCTION

Old age has been accepted as being dependent in terms of health, being less productive in terms of work life, and being at and above the age of 65 in terms of age [1]. With the increasing population of the elderly, the negligence and abuse of the elderly by their relatives or by people who take care of them appear before us as an increasing problem [2]. The International Network for the Prevention of Elder Abuse and the WHO released the Toronto

ADDRESS FOR CORRESPONDENCE:
Eylem Kuday Kaykısız, M.D, Department of Emergency Medicine, Bitlis State Hospital, 13100 Bitlis/Turkey;
e-mail: eylemkuday@hotmail.com, tel: +905413190392

Declaration in 2002 and defined the abuse of the elderly as "The damage given to any elderly who expect trust, and the inappropriate actions that occur once or repeatedly causing stress in the elderly, or the lack of the appropriate behaviors" [3, 4]. The negligence of the elderly is defined as "Not giving the things needed by the elderly such as food, beverages, drugs by their relatives or caregivers, with or without awareness, and behaving in a careless way in fulfilling the responsibilities for the elderly or not fulfilling such responsibilities at all" [5]. NAE is one of the important mortality and morbidity reasons [6–8]. Healthcare employees, especially emergency department (ED) physicians should be careful in detecting this condition [9]. Several tests were developed in the past to detect the elderly abuse [10, 11]. The Hwalek-Sengstock Elder Abuse Screening Test is one of these tests, which measure direct abuse, vulnerability and situational characteristics. It is the most appropriate test for using in hospitals and can be easily applied in a short time period by emergency trauma physicians, geriatricians and even by assistant health staff [12, 13].

Due to many reasons like long-term policlinic appointments, inadequate healthcare staff, and uninterrupted service of ED, the elderly are taken to ED by their relatives, caregivers or by nursing homes. The excessive intensity in ED, the lack of knowledge in health employees and inadequacy of ED conditions cause that the NAE cases go undetected; and only when there is serious doubt can they be recognized.

The main purpose of this study is to evaluate the awareness and attitudes and knowledge levels of the emergency physicians on NAE in elderly patients who are admitted to ED. Meanwhile, it was also aimed to raise the awareness levels on NAE cases by physicians working in ED. It is important to identify and report the factors affecting NAE, and to take precautions and initiatives to prevent it.

METHODS

The Universe and Sampling Selection

Our study is a descriptive study; and was designed as a survey study. The Ethical Board Approval for the study was obtained from Ufuk University, Faculty of Medicine with the number 20171207-6. Emergency medicine academicians, professionals, assistants and general practitioners working at EDs, university hospitals across Turkey, training and research hospitals, state hospitals and private hospitals constitute the universe of the study; and for this reason, it is not known for sure how many people constitute the universe of the study. Since the number of the people in the universe is not known, the number of the sampling was computed with the $N = (t_{1-a})^2 x(pxq)^2/S^2$ formula [14]. The questionnaire was planned to be conducted between December 2017 and April 2018, and when the number of the adequate participants was reached (500 people), the questionnaire application was ended in February 2018. The ED physicians who could be contacted through the Internet and who agreed to participate in the study were included in the study. Those who could not be contacted through e-mails and who did not agree to participate in the study were excluded from the study.

The Scales Used in the Study

The electronic questionnaire, which was created by using the data collection tool, consisted of two titles, which were the Sociodemographic Form and the Questionnaire Form. A total of 19 questions were prepared. Some of the questions had 4-Point Likert-type answers. In the Sociodemographic Data Form, the gender, age, occupational status, institution worked, duration of ED work, the number of patients and the number of the elderly patients who were admitted daily, the percentage of abuse and neglect in the elderly applicants, whether they had received any training related to NAE and whether they followed the up-to-date developments, and if they did, how they followed the up-to-date data on this topic were questioned. The following fields were also questioned in the questionnaire; whether or not they faced NAE before; at which stage they diagnosed NAE; whether or not they received training on NAE; the risk factors in the patients in terms of NAE; whether or not they questioned the 14 items of the Hwalek-Sengstock Screening Test in patients who were suspected in terms of NAE; whether or not they had the NAE screening test; and NAE anamnesis and physical examination findings (23 items); which method they applied when they faced NAE; why the NAE reporting was low; and why such cases were not reported.

The Data Analysis and Statistical Methods

The collected data were recorded in SPSS 23 program and were then analyzed statistically. The descriptive data are given as the number of the participants and percentages. The normal distribution fit-

ness of the variables was examined using the Visual (Histogram and Probability Graphics) and Analytical Methods (Kolmogorov-Smirnov/Shapiro-Wilk tests). The median, 25–75 percentile, and minimum-maximum values were used as descriptors for non-parametric tests. The Mann Whitney U-test was used as a Hypothesis Test in paired groups. The Kruskal Wallis test was used in multiple groups. $P < 0.05$ was taken as statistically significant.

RESULTS

A total of 316 (63.2%) participants were male; and 49% (n = 245) were between 20–30 years of age. According to the occupational status, 34.4% were specialist doctors, 27.6% were general practitioners, 27.4% were research assistants and 10.6% were academicians. A total of 36% (n = 180) worked at state hospitals; and 30,4% (n = 152) had been working at ED for 2–5 years. While the daily number of patients admitted to ED where 41% of the participants worked was over 500; the number of the patients who were over the age of 65 admitted to the ED was between 76–250 in 41.6% (n = 208) of the participants. While in 51.6% (n = 258) of the patients, the percentage of those facing abuse or negligence was below 1%; in 7.2% (n = 36), this rate was above 10%. When the place where the participants received training on the negligence and abuse of the elderly was questioned, it was determined that 39.4% (n = 197) received this training during their education at the medicine faculty; the others received it during specialization training and at courses; and 19.8% (n = 99) did not receive any training at all (Tab. 1).

Statistically significant differences were determined in terms of the awareness levels in the comparisons to the risk factors of the participants who received and who did not receive training, and HS-EAST and awareness both in terms of the risk factors and in anamnesis and FM findings ($p < 0.001$). In further examinations among the groups, it was determined in terms of the awareness of risk factors that those who received training in courses had higher awareness levels than those who did not receive any training; those who received training during specialization education had higher awareness levels than those who received this training in medical faculties; and those who received training during courses had higher awareness levels than those who received this training during medical faculty and specialist period at statistically significant levels.

Table 1. Characteristics of participants.

Characteristics		(n)	%
Sex	male	316	63,2
	female	184	36,8
Age	20–30	196	39,2
	31–40	245	49
	41–50	49	9,8
	> 50	10	2
Status	physician	138	27,6
	research assistance	137	27,4
	emergency medicine specialist	172	34,4
	Lecturer	53	10,6
Institution	State hospital	180	36
	research and training hospital	132	26,4
	university hospital	168	33,6
	other	20	4
Work duration for ED	< 1 age	122	24,4
	2–5 ages	152	30,4
	6–10 ages	132	26,4
	> 10 age	94	18,8
The number of daily patient admissions	0–50	14	2,8
	51–150	107	21,4
	151–500	174	34,8
	> 500	205	41
The number of daily patient over 65 admissions	0–25	65	13
	26–75	163	32,6
	76–250	208	41,6
	> 250	64	12,8
Percentage of abuse and neglect likelihood reported by elderly patients	%0–1	258	51,6
	%2–5	152	30,4
	%6–10	54	10,8
	>%10	36	7,2
Education status about EAN	faculty of medicine	197	39,4
	during the reseach assistantship	98	19,6
	via a course education	106	21,2
	No education	99	19,8
Total		500	100

EAN: Elder Abuse and Neglect.

In terms of the awareness on anamnesis and FM findings, it was determined that those who received training with courses had the highest-level awareness; and those who received training during

Table 2. Comparison of participants that are educated or not in terms of awareness about risk factors, history and physical examination findings of EAN and HS-EAST scale.

Awareness about history and physical examination findings of EAN				
EAN education	median (25–75per)	p value	comparison in subgroups	p value
faculty of medicine (1)	72(64–81)	< 0,001	4–1	0,760
			4–2	0,020 *
research assitantship (2)	76(68–82)		4–3	< 0,001
course (3)	79(75–83)		1–2	0,017 *
no education (4)	72(65–80)		1–3	< 0,001
			2–3	0,009*
Awareness about HS-EAST scale				
education about EAN	median (25–75per)	p value	comparison of subgroups	p value
faculty of medicine (1)	28(21–36)	< 0,001	4–1	1,000
			4–2	0,072
research assitantship (2)	31(27–38)		4–3	< 0,001
course (3)	46(44–48)		1–2	0,073
no education (4)	27(20–36)		1–3	< 0,001
			2–3	< 0,001

EAN: Elder Abuse and Neglect, HS-EAST: Hwalek-Sengstock Elder abuse screening test *p < 0,05

specialization training were more aware than those who received training during medicine faculty and those who did not receive any training at a statistically significant level ($p < 0.001$). In terms of the awareness of anamnesis and FM findings, no statistically significant differences were determined between those who did not receive training and those who received training during the education at medicine faculty. When the data were analyzed in terms of the awareness on HT-EAST Scale, the awareness of those who received training in courses was higher than the other groups at a statistically significant level ($p < 0.001$). No statistically significant differences were determined in the comparisons of other sub-groups ($p > 0.05$) (Tab. 2).

When the relation between the awareness on NAE risk factors, anamnesis and physical examination findings and HS-EAST scale and the duration of working at ED was examined, it was determined that the awareness of those who worked in ED for 6-10 years and more than 10 years was more than those who had a working duration of < 1 year and those > 10 years and those whose working durations were 2–5 years at a statistically significant level ($p < 0.001$). No statistically significant differences were detected between the other subgroups ($p > 0.05$). No significant differences were determined either in terms of the risk factors and the awareness on HS-EAST scale ($p > 0.05$) (Tab. 3).

The relation between the awareness of NAE anamnesis and physical examination findings and the working status was examined, and it was determined that there was a statistically significant difference between the academicians and specialist doctors and research assistant doctors and general practitioners ($p < 0.001$). No statistically significant effect was determined in terms of working status relation between the risk factors and the HS-EAST scale awareness ($p > 0.05$) (Tab. 4).

In our study, the risk factors of the NAE, the genders of the participants, the working durations at ED, and working status of the participants were compared; however, no statistically significant differences were detected.

When the route to be taken in case NAE was faced was analyzed, it was determined that 70% of the participants said "I would report this"; and 13% said "I am indecisive". The reasons for not reporting are given in Table 5 (Tab. 5).

DISCUSSION

According to a compilation on elderly abuse, 10% of the elderly are exposed to abuse in the USA. In

Table 3. Comparison of participants awareness about risk factors, history and physical examination findings of EAN and HS-EAST scale in terms of work duration for emergency department

Awareness about history and physical examination findings of EAN				
work duration (years)	median (25–75per)	p value	comparison of subgroups	p value
< 1 year	72(64–78)	<0,001	<1 year and 2–5 years	0,231
			<1 year and 6–10 years	< 0,001
			<1 years and > 10 years	< 0,001
2-5 years	75(65–81,5)		2–5 years and 6–10 years	0,297
			2–5years and > 10 years	< 0,001
6-10 years	77(69,5–82)		6–10 years and >10 years	0,687
>10 years	79(72–85)			

HS-EAST: Hwalek-Sengstock Elder Abuse Screening Test

Table 4. Comparison of participants awareness about risk factors, history and physical examination findings of EAN and HS-EAST scale in terms of their grades.

Awareness about history and physical examination findings of EAN				
grade	median (25–75per)	p value	comparison fo subhroups	p value
physician (1)	72(65–79)	<0,001	1–2	1,000
			1–3	< 0,001
			1–4	< 0,001
research assistant (2)	73(64–81)		2–3	< 0,001
emergency medicine specialist. (3)	78(72–84)		2–4	< 0,001
lecturer (4)	80(69–84)		3–4	1,000

HS-EAST: Hwalek -Sengstock Elder Abuse Screening Test

the same study it was determined that the elderly abuse was detected in Ireland (2.2%) with the least level; and in Croatia (61.1%) with the highest level in European countries. In Asian countries, the elderly abuse was detected at the highest level in China (36.2%) and at the lowest level in India (14%) [15]. In our study, when the rate of NAE was questioned in the elderly patients who applied to ED; 82% of the participants answered that the rate was below 5%. According to the results of epidemiological studies in Turkey and in the world, these rates are expected to grow much higher in the future. When the results of similar studies in the literature were analyzed, it was determined that health professionals, especially physicians, do not know exactly how often they faced NAE, and therefore little was known about the NAE [16, 17]. One of the reasons is that there may be a large number of patients admitted to ED (41% of the participants in our study had 500 and more patients, and 34.8% had between 151 and 500 patients). Many previous studies pointed out that the Emergency Medicine training program provides very little information on the needs and diseases of the elderly population and that Emergency Medicine Specialists did not receive adequate training in this field [18–26]. Similar studies investigated the level of knowledge, attitudes and behaviors towards NAE, and it was understood that there are many missing points in the diagnosis of NAE and how to act on the subject. In these studies, the participants reported that they had not received adequate and effective training [17, 27–31]. In our study, 81.2% of the participants stated that they were trained about the subject; however, 71% of them did not follow the up-to-date developments in the field. The reason why the training rates were so high in the study may be that it did not specify the educational framework when questioning the training of the participants.

Table 5. The distribution of answers about ways to follow in case of encounter with aggrieved of EAN and evaluation of reasons for not reporting EAN.

	number of participants (n)	percent (%)
Ways to follow in EAN		
1.only clinical intervention is available	6	1,2
2.the family is warned and given suggestions	59	11,8
3. I report EAN as judicial case	237	47,4
4.unstable	65	13
2 + 3	63	12,6
1 + 2	20	4
1 + 3	50	10
Reasons for not reporting EAN		
I believe that physicians are adequately protected against the problems that may arise in these matters.	53	10,6
I can not find enough time to evaluate these patients in emergency department conditions.	136	27,2
I do not have enough knowledge and / or experience in this regard.	117	23,4
I do not want to neglect the patient-physician	9	1,8
The risk of worsening of the current conditions of the patient (family relationship…) / the patient does not want this condition to be known	50	10
Others	15	3
A + B	46	9,2
B + E	66	13,2
C + E	8	1,6
Total	500	100

EAN: Elder Abuse and Neglect

The relationship between the awareness and working status of the NAE anamnesis and physical examination findings was examined; and it was determined that academicians and specialist doctors, research assistants, doctors and general practitioners were more aware of this field. When the relationship between the awareness of the anamnesis and the physical examination findings was investigated in relation to the working duration in ED, it was determined that the awareness of this field increased accordingly to the duration of working at ED. This data suggests that medical school education is inadequate in this context. Not having adequate training and knowledge on the anamnesis and FM in the basic point can cause wrong intervention and is a condition that must be taken seriously. Anamnesis is the most important step in considering the abuse and neglect of the elderly [31].

If we compare where the training was conducted with the NAE risk factors and the awareness of the Hwalek-Sengstock scale, a statistically significant difference was detected between the training courses, the training groups and the other groups. Emergency medicine specialists and academicians may have increased awareness levels because of their clinical experience and their own initiatives. It is obvious that there is a theoretical inadequacy in the faculty of medicine, and in the curricula of the specialization trainings. In this respect, there is a need to revise and organize the relevant trainings and increase the productivity. In the study, the risk factors of the NAE with the gender of the participants, the working duration in ED and the working status were compared; however, no significant differences were detected. One of the risk factors for the elderly people in NAE is the attractive financial resources of the elderly patients [32–34]. This was questioned in our study; and a small number of participants said "The socioeconomic status being high is a risk factor in NAE". Additionally, when the data of the study were analyzed, and when it was considered that there is a high probability of diagnosing the NAE by "general appearance" and "physical examination", emergency physicians take the physical examination findings

into account in most cases and recognize physical abuse. For this reason, economic abuse may go undetected and since they do not have adequate training in this field, they may not notice economic abuse.

In a study by Austin and Rinker [35], physical examination findings which showed abuse at the highest rate were reported as abrasion-like lesions in the skin, decubitus ulcers, and burns. Similar answers were received in our study by the participants with similar physical findings as "highly doubtful" and "moderately suspicious". When the participants were examined in terms of how they diagnosed NAE when they faced it, it was determined that the participants mostly diagnosed the cases with anamnesis, physical examination and general appearance.

The question "Is there a valid and reliable screening test for the elderly abuse?" was asked to the participants in our study; and 9% said "Yes". In the questionnaire used in the present study, the Hwalek-Sengstock Elderly Abuse Screening Test (HS-EAST) consisting of 14 questions was asked. The participants who answered questions about direct abuse and potential abuse answered as "frequently ask" and "certainly ask" below 50%. This suggests that the questions that might detect the direct abuse in the screening test and possible abuse are not asked; and therefore, there is a possibility of such cases being undetected. The HS-EAST awareness and working status were compared and it was determined that there was no statistically significant difference between them. This result suggests that there is little awareness of the screening test, no matter how long the working status is. When we compared the educational status and the awareness on HS-EAST, there was a significant difference between the course trainees and other groups. The inclusion of the abovementioned test in the curricula of medical faculties and in the specialist training programs may increase the awareness in this field because the test has this feature, and this may ensure that such patients are detected and not neglected.

It is seen that in the studies conducted previously, health professionals, especially physicians, are not aware of relevant laws and regulations, and medical protocols that will inform them about NAE [16, 31, 36]. Dong [37] conducted a study and reported that only 1 out of 14 cases reported such cases in NAE. In the study of Mandıracıoğlu et al. [27], most of the participants stated that they did not know what to do when faced with NAE. The number of those who do not report suspicious cases in our work is too high to be neglected (30%). On the other hand, NAE causes significant mortality and morbidity, together with psychosocial problems in the elderly [15] (Referans 15 otomatik olarak alınmamış). When it is analyzed why the participants did not report such cases, there may be many reasons such as excessive workload due to the intensity of the ED, not knowing relevant laws, not feeling self-sufficient about NAE, and increasing violence towards health employees in recent years by the relatives of patients.

CONCLUSION

As a result, we determined that course EA awareness was higher in the NAE case in theoretical field than the other groups (the risk factors, HS-EAST, etc.). While the course EA awareness in NAE cases in practical field (anamnesis and FM findings) is higher than the EA during the specialist training, the lowest awareness was determined in those who did not receive EA and education in medicine faculty was similar, which shows the importance of education. It must be taken seriously because there are missing points in the anamnesis and FM, which are the most basic steps of the education taken in the medical faculties. Considering the scientific studies on NAE in many countries, particularly in the United States, which started many years ago, it is possible to claim that the development in protective and preventive measures are in early stages in Turkey. For this reason, we want to emphasize the need for different studies on this population for future research.

Funding and support: No funding was received.

Conflict of interest: All authors declare that they have no conflict of interest.

Author Contributions: S.O. performed the study design, data collection and analysis, and article's drafting; B.K. study design, analysis and article's drafting; and T.E. study design, data collection, F.A.O. article's drafting; E.K.K. article drafting, Z.K.E. study design and article's drafting, S.C.U. data collection, A.K. analysis and article's drafting and all authors contributed substantially to its revision and approved the final version of the study.

REFERENCES

1. Kutsal G. Yaşlanan dünyanın yaşlanan insanları. Temel Geriatri, Geriatri Derneği yayını, Ankara 2008.

2. Keskinoğlu P. Yaşlıda fiziksel, finansal örselenme ve ihmal edilme. Türk Geriatri Dergisi. 2004; 7(2): 57–61.
3. Organization, W.H. The Toronto declaration on the global prevention of elder abuse. Geneva: WHO. 2002: 3.
4. Organization, W.H. World report on ageing and health. World Health Organization 2015.
5. Acierno R, Hernandez MA, Amstadter AB, et al. Prevalence and correlates of emotional, physical, sexual, and financial abuse and potential neglect in the United States: the National Elder Mistreatment Study. Am J Public Health. 2010; 100(2): 292–297, doi: 10.2105/AJPH.2009.163089, indexed in Pubmed: 20019303.
6. Uysal A, Dünyada yaygın bir sorun: yaşlı istismarı ve ihmali. Sosyal Politika Çalışmaları Dergisi. 2002; 5(5).
7. Oh J, Kim H, Martins D, et al. A study of elder abuse in Korea. International Journal of Nursing Studies. 2006; 43(2): 203–214, doi: 10.1016/j.ijnurstu.2005.03.005.
8. Dyer CB, Connolly M-T, McFeeley P. The clinical and medical forensics of elder abuse and neglect. 2003.
9. Tierney MC, Snow WG, Charles J, et al. Neuropsychological predictors of self-neglect in cognitively impaired older people who live alone. Am J Geriatr Psychiatry. 2007; 15(2): 140–148, doi: 10.1097/01.JGP.0000230661.32735.c0, indexed in Pubmed: 17272734.
10. Reis M, Nahmiash D. Validation of the indicators of abuse (IOA) screen. Gerontologist. 1998; 38(4): 471–480, indexed in Pubmed: 9726134.
11. Fulmer T, et al. Elder neglect assessment in the emergency department. Journal of Emergency Nursing. 2000; 26(5): 436–443, doi: 10.1067/men.2000.110621.
12. Ozmete E. The Hwalek-Sengstock Elder Abuse Screening Test: The adaptation study into Turkish. Anatolian Journal of Psychiatry. 2016; 17(1): 45, doi: 10.5455/apd.200727.
13. Özçakar N, Toprak Ergönen A, Kartal M, et al. Adaptation, reliability, and validity study of the Hwalek-SengstockElder Abuse Screening Test (H-S/EAST): a Turkish version. Turk J Med Sci. 2017; 47(6): 1894–1902, doi: 10.3906/sag-1606-166, indexed in Pubmed: 29306255.
14. Tezcan S. Epidemiyoloji: tıbbi araştırmaların yöntem bilimi. Hacettepe Halk Sağlığı Vakf. 1992.
15. Dong XQi. Elder Abuse: Systematic Review and Implications for Practice. J Am Geriatr Soc. 2015; 63(6): 1214–1238, doi: 10.1111/jgs.13454, indexed in Pubmed: 26096395.
16. Almogue A, Weiss A, Marcus EL, et al. Attitudes and knowledge of medical and nursing staff toward elder abuse. Arch Gerontol Geriatr. 2010; 51(1): 86–91, doi: 10.1016/j.archger.2009.08.005, indexed in Pubmed: 19775762.
17. Kennedy RD. Elder abuse and neglect: the experience, knowledge, and attitudes of primary care physicians. Fam Med. 2005; 37(7): 481–485, indexed in Pubmed: 15988632.
18. Arai H, Ouchi Y, Yokode M, et al. Members of Subcommittee for Aging. Toward the realization of a better aged society: messages from gerontology and geriatrics. Geriatr Gerontol Int. 2012; 12(1): 16–22, doi: 10.1111/j.1447-0594.2011.00776.x, indexed in Pubmed: 22188494.
19. Sinha SK, Bessman ES, Flomenbaum N, et al. A systematic review and qualitative analysis to inform the development of a new emergency department-based geriatric case management model. Ann Emerg Med. 2011; 57(6): 672–682, doi: 10.1016/j.annemergmed.2011.01.021, indexed in Pubmed: 21621093.
20. Wilber ST, Gerson LW, Terrell KM, et al. Geriatric emergency medicine and the 2006 Institute of Medicine reports from the Committee on the Future of Emergency Care in the U.S. health system. Acad Emerg Med. 2006; 13(12): 1345–1351, doi: 10.1197/j.aem.2006.09.050, indexed in Pubmed: 17071799.
21. Biese KJ, Roberts E, LaMantia M, et al. Effect of a geriatric curriculum on emergency medicine resident attitudes, knowledge, and decision-making. Acad Emerg Med. 2011; 18 Suppl 2: S92–S96, doi: 10.1111/j.1553-2712.2011.01170.x, indexed in Pubmed: 21999564.
22. Prendergast HM, Jurivich D, Edison M, et al. Preparing the front line for the increase in the aging population: geriatric curriculum development for an emergency medicine residency program. J Emerg Med. 2010; 38(3): 386–392, doi: 10.1016/j.jemermed.2008.05.003, indexed in Pubmed: 19028039.
23. Carpenter CR, Shah MN, Hustey FM, et al. High yield research opportunities in geriatric emergency medicine: prehospital care, delirium, adverse drug events, and falls. J Gerontol A Biol Sci Med Sci. 2011; 66(7): 775–783, doi: 10.1093/gerona/glr040, indexed in Pubmed: 21498881.
24. Foo CL, et al. Profiling acute presenting symptoms of geriatric patients attending an urban hospital emergency department. Annals Academy of Medicine Singapore, 2009. Ann Acad Med Singapore. 2009; 38(6): 515, indexed in Pubmed: 19565102.
25. Shah MN, Bazarian JJ, Lerner EB, et al. The epidemiology of emergency medical services use by older adults: an analysis of the National Hospital Ambulatory Medical Care Survey. Acad Emerg Med. 2007; 14(5): 441–447, doi: 10.1197/j.aem.2007.01.019, indexed in Pubmed: 17456555.
26. Reuben DB, Bachrach PS, McCreath H, et al. Changing the course of geriatrics education: an evaluation of the first cohort of Reynolds geriatrics education programs. Acad Med. 2009; 84(5): 619–626, doi: 10.1097/ACM.0b013e31819fb89d, indexed in Pubmed: 19704195.
27. Mandiracioglu A, Govsa F, Celikli S, et al. Emergency health care personnel's knowledge and experience of elder abuse in Izmir. Arch Gerontol Geriatr. 2006; 43(2): 267–276, doi: 10.1016/j.archger.2005.10.013, indexed in Pubmed: 16332396.
28. Ahmed A, Choo WY, Othman S, et al. Understanding of elder abuse and neglect among health care professionals in Malaysia: An exploratory survey. J Elder Abuse Negl. 2016; 28(3): 163–177, doi: 10.1080/08946566.2016.1185985, indexed in Pubmed: 27149412.
29. Vetere PM. Elder abuse: what are we missing? Can Fam Physician. 2011; 57(7): 783–785, indexed in Pubmed: 21753101.
30. Kleinschmidt K. Elder Abuse: A Review. Annals of Emergency Medicine. 1997; 30(4): 463–472, doi: 10.1016/s0196-0644(97)70006-4.

31. Jones JS, et al. Elder mistreatment: national survey of emergency physicians. Ann Emerg Med. 1997; 30(4): 473–479, indexed in Pubmed: 9326862.
32. Kissal A, Beser A. Identifying and evaluating elder abuse and neglect. TAF Prev Med Bull. 2009; 8(4): 357–364.
33. Lachs MS, Williams CS, O'Brien S, et al. The mortality of elder mistreatment. JAMA. 1998; 280(5): 428–432, indexed in Pubmed: 9701077.
34. Arpaci F, Bakir B. Yaşlı İstismarı ve İhmali. Journal of Social Research. 691.
35. Rinker AG. Recognition and perception of elder abuse by prehospital and hospital-based care providers. Arch Gerontol Geriatr. 2009; 48(1): 110–115, doi: 10.1016/j.archger.2007.11.002, indexed in Pubmed: 18160115.
36. Clark-Daniels C, Daniels RS, Baumhover L. Abuse and neglect of the elderly: Are emergency department personnel aware of mandatory reporting laws? Annals of Emergency Medicine. 1990; 19(9): 970–977, doi: 10.1016/s0196-0644(05)82556-9.
37. Dong X. Medical implications of elder abuse and neglect. Clin Geriatr Med. 2005; 21(2): 293–313, doi: 10.1016/j.cger.2004.10.006, indexed in Pubmed: 15804552.

VIA MEDICA

ORIGINAL ARTICLE

Disaster and Emergency Medicine Journal
2018, Vol. 3, No. 3, 91–95
DOI: 10.5603/DEMJ.2018.0020

ISSN 2451–4691

COMPARISON ANALYSIS OF NEWBORN BIRTHING WITH VAGINAL DELIVERY AND CESAREAN SECTION

Magdalena Roguska[1], Łukasz Czyżewski[2], Janusz Wyzgał[2], Izabela Sztybor[3], Dominika Dunder[3], Emilia Czyżewska[4]

[1] Student of Faculty of Health Sciences, Collegium Mazovia Innovative University, Siedlce, Poland
[2] Department of Nephrology Nursing, Medical University of Warsaw, Poland
[3] Lazarski University, Warsaw, Poland
[4] Department of Laboratory Diagnostics, Medical University of Warsaw, Warsaw, Poland

ABSTRACT

INTRODUCTION: Most of them perceive a vaginal delivery as morbid, painful, often complicated. Fear of pain, fear of a child, negative experiences associated with a previous birth and the opinions of relatives often contribute to the termination of pregnancy through cesarean section without medical indications "cesarean section on demand". The aim of the study was to compare the state of newborns born with vaginal delivery with newborns born through caesarean section.

METHODS: The research was carried out in January 2018 at the District Hospital in Węgrów (Poland) at the Neonatology Department. 47 consecutive newborns of the Neonatological Department born in January 2018, were included in the study.

RESULTS: The study group consisted of 47 newborns — 27 (57%) newborns were enrolled in the group of neonates born via caesarean section. The termination of pregnancy occurred usually at week 39 (± 1), and the average age of the maternal mothers is 30 years (± 5). The child's weight is 3622g (± 523), umbilical cord pH 7.359 (± 0.052). Maternal age does not seem to have a significant impact on the type of delivery in the case of caesarean section, the average age is 29 years (± 6), in terms of childbirth, the mother's age is 30 years (± 6).

CONCLUSIONS: In conclusion, our data indicate that: (1) The average weight of neonates born via caesarean section is higher than the postnatal weight of newborns from vaginal delivery; (2) There is a relationship between the mother's age and the pH value of umbilical cord blood and postnatal weight of the child; (3) Transient and vomiting are more common in neonates born by caesarean section in the adaptive period; (4) The type of delivery does not affect the pH of umbilical cord blood of a newborn.

KEY WORDS: caesarean section, vaginal delivery, neonatal outcome

Disaster Emerg Med J 2018; 3(3): 91–95

INTRODUCTION

In the last dozen or so years a significant increase in the number of cesarean sections can be observed. According to the recommendations of the World Health Organization (WHO), only 10–15% of deliveries should end in operation. In Poland, meanwhile, the number of imperial cuts performed exceeds 30% of all births.

ADDRESS FOR CORRESPONDENCE:
Łukasz Czyżewski, Department of Nephrology Nursing, Medical University of Warsaw, Poland
e-mail: czyzewski_lukasz@wp.pl

According to the position of the Polish Gynecological Society (PGS), the caesarean section is aimed at completing pregnancy or childbirth when further waiting for their natural ending is a danger to the mother or child. The most common indications for the operational completion of pregnancy are: threatening intrauterine fetal distress, abnormal positioning, lack of delivery progress and condition after cesarean section. In addition to medical indications, the factors that contribute to the increase in the operating percentage of pregnancy completion are more and more often is the will of mothers, as well as concerns of obstetricians about possible claims as a consequence of complications during vaginal delivery. In many cases, the future mother's psychological approach to the delivery by vaginal route has a huge impact on the decision about the method of pregnancy.

Most of them perceive a vaginal delivery as morbid, painful, often complicated. Fear of pain, fear of a child, negative experiences associated with a previous birth and the opinions of relatives often contribute to the termination of pregnancy through cesarean section without medical indications "cesarean section on demand". Women are forgetting that the cesarean section, despite significant progress in medicine, is an operation that carries the risk of intra and postoperative complications. The widespread opinion that it is burdened with a lower risk of threats compared to vaginal delivery is therefore not entirely compatible with the actual state of affairs.

An elective caesarean section reduces the risk of intrauterine hypoxia, perinatal injuries and tar suspension syndrome. Nevertheless, it is not a natural way of delivery and carries the risk of adaptation problems in ectopic conditions. Cesarean section causes respiratory failure in the course of transient acceleration syndrome, respiratory distress syndrome and pulmonary hypertension syndrome both in newborns as well as in "late preterm infants". Therefore, children delivered by cesarean sections compared to vaginal delivery ones in many cases require extended stay in the hospital, as well as the use of advanced medical procedures such as mechanical ventilation [1, 2].

Childbirth is the stage of developing the relationship between mother and child. It is formed on the basis of satisfying the basic needs of the child such as: sucking, ensuring the right temperature and protection against the stimuli of the outside world. The situation that allows the mother to interact with the child is contact "skin to the skin" immediately after giving birth. Such contact lasting at least two hours is recommended for all healthy newborns regardless of the delivery route, This contact is disturbed after cesarean section which has an adverse effect on the psychological, medical and health aspects of the newborn [3, 4].

Caesarean section is a procedure that arouses much controversy. It has already been used in antiquity, it was initially used as a fetal life-saving surgery, now it is very often performed without specific indications. Perceived by society as a simple and most comfortable way to give birth to children.

The aim of the study was to compare the state of newborns delivered by vaginal route with newborns delivered through caesarean section.

METHODS

The research was carried out in January 2018 at the District Hospital in Węgrów (Poland) at the Neonatology Department. 47 consecutive newborns of the Neonatological Department born in January 2018 were included in the study. The research was carried out in accordance with the principles of ethics — The Declaration of Helsinki.

The study excluded newborns who: (1) died immediately after delivery; (2) there was a need to transport a higher reference level to the institution immediately after delivery.

Newborns were divided into two groups: newborns born by vaginal delivery and newborns born via caesarean section for comparative analysis. In addition, a division was made based on the sex of the newborn, the age of the mother and the weight after the birth of the newborn.

STATISTICAL ANALYSIS

Results concerning quantitative variables were presented as average values ± standard deviation. Qualitative variables (age, sex) were presented as quantity (n) and percentage values of the whole group (%) while proportions in groups were assessed with a T-student test. Statistica 13.1 software (StatSoft Inc., Tulsa, OK) was used in the statistical analysis. $P < 0.05$ was adopted as the significance level.

RESULTS

The study group consisted of 47 newborns — 27 (57%) newborns were enrolled in the group

of neonates born via caesarean section. Table 1 presents the general characteristics of the group of newborns examined, which shows that the number of pregnancies and deliveries is on average 2 (± 1). The termination of pregnancy occurred usually at week 39 (± 1), and the average age of the maternal mothers is 30 years of age (± 5). The child's weight is 3622 g (± 523), umbilical cord pH 7.359 (± 0.052).

Table 2 shows the division of newborns due to the type of delivery. There were no statistically significant differences between the type of delivery and the number of pregnancies, which are on average 2 (± 1). Maternal age does not seem to have a significant impact on the type of delivery in the case of caesarean section, the average age is 29 years of age (± 6), in terms of childbirth, the mother's age is 30 years of age (± 6). The pregnancy termination in both cases occurs in 39 weeks (± 1). Natural delivery scoring according to the Apgar scale is 10pts (± 0), similarly caesarean section maintains the value of 10 points (± 1). The visible differences can be seen in the weight of newborns born with caesarean section 3729 g (± 520), which is significantly higher than the weight of newborns born via the vaginal route 3477 g (± 505). The umbilical cord blood pH at caesarean section is 7.367 (± 0.039), slightly different from the second type of delivery where it is 7.348 (± 0.065). The value of glucose from umbilical cord blood after C/S (Ceasarian Section) is 79 mg% (± 18) and 82 mg% (± 20) after natural birth. The bilirubin level in the first case is 1.5 md/dl (± 2.6) and does not differ significantly from the value of bilirubin of naturally born children 1.9 mg/dl (± 2.9). The saturation between 2 and 12 hours in both cases is 98% (± 1), and the heart rate in neonates from caesarean section 122 / min (± 9) and natural births 123/min (± 8).

The average age of mothers was 30 years of age (± 5.1). There were no significant differences between the influence of age on the type of delivery, in the group of newborns born by force the average age was 30.0 years of age (± 5.8), and newborns born via cesarean section 29.4 years of age (± 5.6).

Table 3 presents the characteristics of newborns taking into account the age of the maternal mothers. The average age of mothers in the first group is 34 years of age (± 4) and is significantly higher than those in the second group, where it main-

Table 1. General characteristics of the group of newborns examined

Number of pregnancies	2 ± 1
Age of the maternal mothers [y]	30 ± 5
Termination of pregnancy [week]	39 ± 1
Apgar scale [pts]	10 ± 1
Child's weight [g]	3622 ± 523
Umbilical cord pH	7,359 ± 0,052
Glucose [mg%]	74 ± 16
Bilirubin [mg/dl]	1,4 ± 2,5
Saturation [%]	98 ± 1
Heart rate [bpm]	124 ± 10

Table 2. Characteristics of newborns due to the type of delivery

	Caesarean section	Vaginal delivery	P
Number of pregnancies	2 ± 1	2 ± 1	0,700
Mother's age [y]	29 ± 6	30 ± 6	0,153
Pregnancy termination [week]	39 ± 1	39 ± 1	0,448
Apgar scale [pts]	9 ± 0,7	10 ± 0,0	0,048
Weight of newborns [g]	3729 ± 520	3477 ± 505	0,102
Umbilical cord blood pH	7,367 ± 0,039	7,348 ± 0,065	0,220
Glucose [mg%]	79 ± 18	82 ± 20	0,414
Bilirubin [mg/dl]	1,5 ± 2,6	1,9 ± 2,9	0,982
Saturation [%]	98 ± 1	97 ± 1	0,011
Heart rate [bpm]	122 ± 9	123 ± 8	0,125

Table 3. Characteristics of newborns taking into account the age of the maternal mothers.

	> 30 years of age	< 30 years of age
Number of pregnancies	3 ± 1	2 ± 1
Mother's age [y]	34 ± 4	26 ± 3
Pregnancy termination [week]	39 ± 1	40 ± 1
Apgar scale [pts]	10 ± 0	10 ± 1
Weight of newborns [g]	3489 ± 550	3773 ± 458
Umbilical cord blood pH	7,35 ± 0,06	7,37 ± 0,04
Glucose [mg%]	72 ± 12	77 ± 20
Bilirubin [mg/dl]	1,50 ± 2,61	1,65 ± 3,02
Saturation [%]	98 ± 1	98 ± 1
Heart rate [bpm]	124 ± 12	123 ± 9

tains the value of 26 years of age (± 3). In the age group above 30 years of age, pregnancy was usually resolved at 39 weeks of pregnancy (± 1), and in patients below 30 years of age at 40 weeks of pregnancy (± 1). In the case of the older group, the Apgar score was 10 points. (± 0) which did not differ from the newborns of the second group — also 10 points (± 1). Significant differences can be seen in the weight of children. In the case of children of older mothers it is smaller and amounts to 3489 g (± 550), the average group maintains an average of 3773 g (± 458). The umbilical cord blood in the first case is 7.35 (± 0.06) without making any significant difference in the pH of the second group of newborns 7.37 (± 0.04). A small difference in the cord blood glucose level after the age of 30 is 72 mg% (± 12), while in younger patients the mean value is 77 mg% (± 20). Bilirubin in the first case is 1.50 mg/dL (± 2.61) and in the second case 1.65 mg/dL (± 3.02). In both cases, post-natal saturation is 98% (± 1), and the pulse without significant differences in newborns of older mothers is 124/min (± 12), and in younger newborns 123/min (± 9).

Table 4 presents the characteristics of the examined group divided into the weight of the newborns. Newborns below 3500 g have been born by women pregnant for the third time on average (± 1), and newborns over 3500 g from second pregnancy (± 1). The mother's age for the first group of newborns was on average 35 years of age (± 4) and was slightly higher than the mothers of the heavier group of newborns, where it was 32 years of age (± 5).

Transient states are observed in the majority of newborns. In the case of newborns born naturally, 44% of them showed the appearance of various transitional states. When it comes to children born with caesarean section, this percentage was slightly higher and amounted to 56% of the whole group born this way.

DISCUSSION

The comparison of neonatal status born via caesarean section and vaginal delivery seems to be a very interesting research problem due to the growing trend among mothers of the future, which is an operating birth, considered as the least risky. Showing the differences between newborns from particular types of delivery is the goal of the above work.

There are many articles about the perinatal state of the newborn. One of them is a paper by Piec et al. [5] in which the postnatal clinical condition of newborns born by caesarean section and vaginal delivery was compared. 485 newborns born by caesarean section and 485 newborns who were born vaginally were randomly selected for the study. In the group of newborns analyzed, it was demonstrated that caesarean section compared with vaginal delivery was associated with more frequent childbirth in the severe condition and more frequent occurrence of acidosis (pH < 7.20).

Table 4. Characteristics of the examined group divided into the weight of the newborns

	< 3500g	> 3500g
Number of pregnancies	3 ± 1	2 ± 1
Mother's age [y]	35 ± 4	32 ± 5
Pregnancy termination [week]	39 ± 1	39 ± 1
Apgar scale [pts]	10 ± 0	10 ± 1
Weight of newborns [g]	3059 ± 386	3861 ± 369
Umbilical cord blood pH	7,35 ± 0,05	7,36 ± 0,06
Glucose [mg%]	73 ± 14	74 ± 15
Bilirubin [mg/dl]	1,39 ± 2,31	1,45 ± 2,44
Saturation [%]	98 ± 1	98 ± 1
Heart rate [bpm]	124 ± 10	125 ± 11

Table 5. Simple linear regression analysis (Pearson) between Week of pregnancy termination and Apgar scale

	Week of pregnancy termination		Apgar scale	
	R	P	R	P
Weight of newborns	0.659	< 0.001	0.531	< 0.001
pH	0.985	< 0.001	0.919	< 0.001
Saturation	0.981	< 0.001	0.923	< 0.001
Apgar scale	0.905	< 0.001	–	–
Heart rate	0.859	< 0.001	0.802	< 0.001
Mother's age	0.530	< 0.001	0.590	< 0.001
Bilirubin	-0.079	0.590	-0.031	0.831
Glucose	0.454	0.001	0.402	0.005
Pregnancy termination	–	–	0.905	< 0.001

In our own results, it was demonstrated that delivery ended with caesarean section was associated with a slightly reduced Apgar score. There were no statistically significant differences in the umbilical cord pH values.

The work by Królak-Olejnik et al. [6] compares the post-natal clinical state and the values of anthropometric parameters of newborns delivered by caesarean section. A group of 1648 newborns born in the Department of Perinatology and Gynecology in Zabrze, 66.9% of all births, was included in the study. The research showed that body weight, chest length and circumference were lower in neonates born via caesarean section.

In their own research, newborns from cesarean section also presented a greater percentage of all births, which was 57%. A significant difference is the weight of newborns from cesarean section, whose average value in the analyzed material was 3151 g. Our own studies showed a significant relationship between weight and type of delivery, where the average weight of newborns delivered via caesarean section was 3729 g which was much higher than the birth weight of children with natural births. In many cases the child's weight was an indication for an operative solution to pregnancy.

Study in the neonatal ward requires intensive observation of the newborn immediately after birth, as well as during further days of hospitalization. One of the most important things that have been demonstrated are, first of all, the transient states occurring during the three-day stay in the ward, appearing to a greater extent in newborns born surgically. It has been shown that 61% of neonates from cesarean section are accompanied by vomiting with fetal water, which is mainly caused by limited contact with the mother. This is indeed a very common condition that is not arguable.

The weight of the child, which affects the type of delivery, can also be considered good and consistent with the actual state of the test. Naturally born newborns have been shown to have lower body weights than those born via caesarean section. Increased weight has been shown in the case of newborns, as well as in children of mothers below 30 years of age.

In the analyzed group of newborns the type of delivery did not have a significant impact on the pH of the umbilical vein. There were also no significant differences in Apgar scores. The influence of the delivery type on the perinatal state of the newborn has not been proven. Autopsy shows that this result does not refer to the real state.

Childbirth by caesarean section has become a very popular pregnancy solution. Considered among the public as a safe, painless way, with low probability of complications. In fact, it is a method that in many cases saves lives, but sometimes the caesarean section is performed without specific medical indications, often at the request of the pregnant woman, not aware of the negative impact of this birth path on the newborn's condition, which often has huge problems with adapting to ectopic life. Newborns born surgically seem to be more restless and screaming, more likely to vomit with amniotic fluid, to keep their body temperature at a higher temperature, and more often to experience transient and respiratory disorders. Each future parent should be aware that natural childbirth by vaginal route is the best way to terminate a pregnancy if there are no contraindications to it, i.e. a risk to the health or life of the mother and child.

In conclusion, our data indicate that: (1) The average weight of neonates born via caesarean section is higher than the postnatal weight of newborns from vaginal delivery; (2) There is a relationship between the mother's age and the pH value of umbilical cord blood and postnatal weight of the child; (3) Transient and vomiting are more common in neonates born by caesarean section in the adaptive period; (4) The type of delivery does not affect the pH of umbilical cord blood of a newborn.

REFERENCES

1. Chazan B. Successful delivery. PZWL. 2014.
2. Gallagher-Mundy C. Caesarean section. Return to form. Mamania. 2013.
3. Baston H, Hall J. Childbirth.Basics of obstetrics. 2011.
4. Bokiniec R, Gajewska E, Kawalec W. Basics of neonatology. PZWL. 2015.
5. Piec P, Suchocki S, Obst M, et al. Cesarean section and vaginal delivery- impact on neonatal outcome. Perinatologia, Neonatologia i Ginekologia. 2008; 1: 94–97.
6. Baston H, Hall J. Basics of obstetrics. Wrocław 2011.

VIA MEDICA

REVIEW ARTICLES

Disaster and Emergency Medicine Journal
2018, Vol. 3, No. 3, 96–100
DOI: 10.5603/DEMJ.2018.0021

ISSN 2451–4691

USE OF VIDEO LARYNGOSCOPES BY INEXPERIENCED PERSONNEL IN DIFFICULT INTUBATIONS

Maciej Sip[1], Radoslaw Zalewski[1], Tomasz Klosiewicz[1], Bartosz Zawada[1], Mateusz Szarek[2], Zuzanna Popielarska[2], Marek Dabrowski[3]

[1] Department of Rescue and Disaster Medicine, Poznan University of Medical Sciences, Poznan, Poland
[2] Lazarski University, Warsaw, Poland
[3] Chair and Department of Medical Education, Poznan University of Medical Sciences, Poznan, Poland

ABSTRACT

The current gold standard in securing airway patency remains to be endotracheal intubation. It is the only method, which allows for nearly 100% protection of the bronchial tree from aspiration of gastric contents as well as providing the most ideal circumstances for control of ventilation parameters. Endotracheal intubation, although in many aspects superior to other methods of securing airways, can only be performed by skilled and experienced personnel in ideal conditions. An example of such conditions are in an operating room in the preoperative period when an anesthesiologist is able to proficiently perform the task with all of the tools and equipment needed at hand. However, in many situations, especially in emergencies, such ideal conditions are difficult or impossible to achieve. One of the many reasons behind this is often the lack of experienced personnel at the scene of an emergency. Another significant difficulty arises from trauma patients who must maintain an immobilized cervical spine, as well as those patients who are undergoing active cardiopulmonary resuscitation when providing high quality chest compressions is the highest priority. Therefore, it seems reasonable to look for the methods which on one hand will secure an airway with a tube inserted directly into the larynx, and on the other hand will make the procedure more accessible to less experienced personnel by maintaining the proper patient safety throughout the whole procedure. A noteworthy method, which achieves this goal, is the use of the video laryngoscopes for endotracheal intubation. The participation in a short introductory training, regarding the use of the device itself, is sufficient to allow for the efficient intubation. The parameters which can be used to compare these different intubation methods include the ease of use, the rate of effectiveness of the first intubation trial as well as the total time needed for the procedure. The authors of this article attempt to compare classic laryngoscopes to video-assisted laryngoscopes.

KEY WORDS: video laryngoscopy, macintosh laryngoscope, endotracheal intubation, airway management, patient safety.

Disaster Emerg Med J 2018; 3(3): 96–100

INTRODUCTION

Endotracheal intubation is regarded as the best method of securing an airway in both the hospital and prehospital setting [1, 2]. According to the recommendations of the European Resuscitation Council (ERC), endotracheal intubation is the best method to maintain an airway during sudden cardiac arrest, where a patient's oxygen reserves can be as short as 3–5 minutes [3]. However, this is not a simple procedure, therefore performing it causes a high degree

ADDRESS FOR CORRESPONDENCE:
Marek Dabrowski, Chair and Department of Medical Education, Poznan University of Medical Sciences, Poznan, Poland
e-mail: maro.dabrowski@gmail.com

of stress even amongst experienced staff, and any delays in delivering adequate ventilation can cause life-threatening complications to the patient [4]. Obstructed airways as well as airways at high risk of obstruction are very commonly encountered in the prehospital setting. There are many indications for when the patient requires instrumental airway production often without the use of anesthetics or full sedation. These indications include;

- Airway protection against aspiration and regurgitation,
- Providing mechanical ventilation in the treatment of respiratory failure,
- Head injuries with a GCS $<$ 8 points,
- Trauma patients with flail chest injury [5].

The definition set out by the American Society of Anaesthesiology for a difficult intubation is the one, which takes more than three attempts with a conventional laryngoscope to be successful, or the one which takes more than 10 minutes to perform by an experienced person. The occurrence of difficult intubations in the prehospital settings varies from 1.5– 8% of all intubations [6], and the effectiveness of direct laryngoscopy performed by emergency medical personnel assessed in many studies is inconclusive [7]. These results significantly exceed the number of difficult intubations performed in the hospital setting in the emergency department or the operating room [8]. To compare, the incidence of difficult intubations in the emergency department is 3–5.3%. The potential complications associated with intubation which may harm a patient are mainly related to injuring the respiratory tract caused by improper usage of the laryngoscope blade, incorrectly introducing the endotracheal tube into the esophagus, as well as intubating the right main stem bronchus. It is also important to note the complications directly felt by the patient, such as hoarseness, throat pain and injury causing bleeding from the oral cavity [9]. When endotracheal intubation is being performed during ongoing cardiopulmonary resuscitation, many additional unfavorable factors may present themselves such as the movement of the victim's body during chest compressions or restricted access to the patient's head [10]. A confirmation of the fact that endotracheal intubation in the prehospital setting performed with a classic laryngoscope is extremely difficult, is that up to one third of attempts are unsuccessful [11], along with a significantly increased risk of hypoxia, aspiration or cardiac arrest after two intubation attempts [12, 13]. When performed by inexperienced users, initial success rates of the first-time intubation vary from 35–65% [14].

FIGURE 1. Macintosh Laryngoscope

Currently, there are around 10 different types of video laryngoscopes available on the market. The goal of this study was to compare the currently available video laryngoscopes with the aid of the literature surrounding them. A few of these devices were compared based on the available studies. The factors considered were the ease of use, successful intubation among experienced professionals as well as among novices and the rate of the first successful attempt of intubations. These factors were compared to the currently standard Macintosh laryngoscope (Fig. 1).

Endotracheal intubation techniques in literature

Endotracheal intubation of trauma patients, especially those with suspected cervical spine injuries is often the procedure of choice to maintain a patient's airway [15]. These patients are at greater risk of vomiting and losing their airways as a result of central nervous system injury and altered mental status [16]. These victims require constant stabilization of their cervical spine. As shown in many studies, the use of an orthopedic collar limits the opening of the patient's oral cavity [17, 18], as well as limits head movement which results in markedly lower rates of first-time intubation success with the use of direct laryngoscopes [19, 20]. In a study by Kłosiewicz et al., the use of a standard Macintosh laryngoscope was compared to the use of the TotalTrack VLM device (Fig. 2). In the case of intubation of a patient in which the cervical spine is stabilized by hand, the intubation procedure was performed in 18.7s vs 22.9s, with the first successful breath being delivered in 19.0s vs 12.1s and a first attempt intubation success rate of 81% vs 98% while using the Macintosh laryngoscope vs the TotalTrack VLM respectively. Furthermore, when the patient's cervical spine was stabilized by the use of an orthopedic collar, the total time of the proce-

FIGURE 2. Endotracheal intubation with TotalTrack VLM system

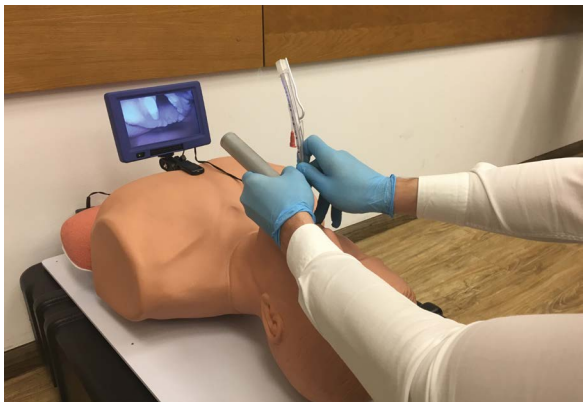

FIGURE 3. Using a technic of Videolaryngoscopy

dure was 24.7s vs 23.7s, with the first breath being delivered in 25.2s vs 13.3s and a first attempt intubation success rate of 49% vs 97% [21].

Shravanalakshmi D et al. compared the King Vision video laryngoscope with the C-MAC video laryngoscope in patients with a cervical spine stabilized with an orthopedic collar. For the purposes of the study, the anterior portion of the collar was removed, and the patient's chin was stabilized by hand. The first attempt intubation success rate was 93.3% vs 100% respectively, while the total procedure time was comparable at 24.9 ± 7.2 seconds [17]. Meanwhile, Smereka et al. compared the C-MAC video laryngoscope with the Macintosh laryngoscope. The participants of this study were 70 paramedics each with a minimum of 5 years of experience who performed endotracheal intubation on patients in three scenarios; without cervical spine stabilization, with manual cervical spine stabilization, and with stabilization achieved with an orthopedic collar. With different partial results for the individual scenarios, intubation with the use of an orthopedic collar showed first attempt success rates of 100% utilizing the C-MAC vs 51.4% using a Macintosh laryngoscope and a total time of intubation being 20.5s vs 27s respectively [20]. Many other studies also focused on evaluation of video assisted laryngoscopes in the inexperienced personnel. In the study carried out by Sierzantowicz et al. the effectiveness of the ETView laryngoscope was assessed during the ongoing cardiopulmonary resuscitation. Following a 10-minute practical training on the usage of the ETView device (Fig. 3), first attempt of intubation success rates were 100% [21]. A similar group of inexperienced personnel was studied by Wolf et al., evaluating the teaching of intubation methods using a Macintosh laryngoscope and King Vision video laryngoscope at courses run by the American Heart Association.

The study examined the effectiveness of students utilizing direct intubation after practical exercises using a video laryngoscope and vice versa, intubation with the King Vision video laryngoscope after practical exercises with a classic laryngoscope. The rate of successful first attempt intubations was 48% and 52% respectively, in which 17% of students utilizing direct intubation intubated the esophagus compared to the 4% of students who had done the same using the King Vision video laryngoscope [22]. In the study performed by Alvis BD et al. usage of McGrath MAC (Fig. 4) and King Vision video laryngoscopes was tested in those not previously familiar with the equipment. The results showed that the group using the McGrath MAC achieved a quicker time of intubation at 17s vs the 38s it took for the group using the King Vision. Furthermore, the rate of the first attempt successful intubation was 100% and 89% respectively [23].

Similar results were achieved in a study conducted by Eismann H et al. The study focused on surgeons who were previously inexperienced in video

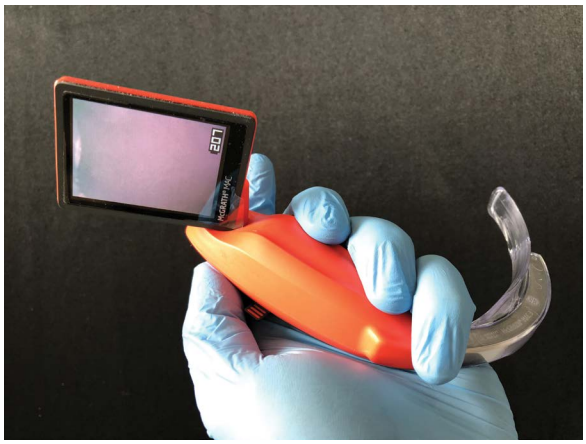

FIGURE 4. Intubation using McGrath MAC videolaryngoscope

laryngoscopy. After taking part in different workshops regarding such video laryngoscopy devices as the C-MAC, King Vision as well as the Macintosh laryngoscope, the surgeons were given both simple and difficult airways to intubate. The results show that video laryngoscopy was much more effective in achieving successful endotracheal intubation, especially in difficult airways with diminished oral cavity opening or limited neck movement. The video laryngoscopes allowed for much better visualization of the airway than the standard Macintosh laryngoscope [24]. A comparison of the use of several video laryngoscopes by a group of 50 inexperienced in intubation medical students, was also undertaken by Rendeki et al. Participants tested a few different devices including King Vision, Airtraq and the Macintosh laryngoscope. The study measured time to successful intubation, number of intubation trials, the rate of first-time intubation success, esophageal intubations as well as tooth damage. Following 15 minutes of training and a period of 30 minutes following this training, participants achieved a rate of successful first intubations of > 90% and a time of intubation of < 25 seconds. These inexperienced participants favored the use of video laryngoscopes in the setting of both simple and difficult airways [25]. The group of difficult airways were patients who were morbidly obese (BMI > 50kg/m2). Ndoko et al. evaluated the efficacy of obtaining an airway with the use of the Airtraq video laryngoscope and the Macintosh laryngoscope. The intubation time with the Airtraq was 24 (16) vs 56 (23)s with the Macintosh laryngoscope, as well as a favourable SpO2 saturation index result for the Airtraq [26].

FIGURE 5. Airtraq

Intubation of overweight patient groups was also studied by Gaszysnski who analyzed the use of the TotalTrack video laryngoscope and the Macintosh laryngoscope. In all cases in which the TotalTrack was used the Cormack-Lehane the score was 1, and intubation was successfully performed in 11/12 patients. In the cases where a Macintosh laryngoscope was used there was a 100% success rate for intubation, however in four cases the Cormack-Lehane the score was 2 and in three cases the score was 3 [27].

CONCLUSION

The results of the studies examined showed that all authors reached similar conclusions. Intubation performed by using a Macintosh laryngoscope by inexperienced users in unfavorable circumstances, i.e. an immobilized cervical spine with an orthopedic collar, during ongoing CPR or in overweight patients is an extremely difficult task. A short introductory training to video laryngoscopy gives a higher rate of first-time intubation success as well as shortens the time needed for successful intubation. Video laryngoscopy provides very good visualization of the larynx, therefore making it an ideal solution for intubating difficult airways with limited mouth opening, a stabilized cervical spine or in patients with an elevated risk of hypoxemia and aspiration. On the basis of the above analysis it can be concluded that the use of video laryngoscopes by inexperienced users is a legitimate method which may bring many benefits as well as increases patient safety.

REFERENCES

1. Ladny JR, Sierzantowicz R, Kedziora J, et al. Comparison of direct and optical laryngoscopy during simulated cardiopulmonary resuscitation. Am J Emerg Med. 2017; 35(3): 518–519, doi: 10.1016/j.ajem.2016.12.026, indexed in Pubmed: 28089239.
2. Sip M, Dabrowska A, Prucnal K, et al. Supraglottic devices — future or everyday life? Disaster Emerg Med J. 2017; 2(2): 74–83, doi: 10.5603/DEMJ.2017.0015.
3. Soar J, Nolan JP, Böttiger BW, et al. Adult advanced life support section Collaborators. European Resuscitation Council Guidelines for Resuscitation 2015: Section 3. Adult advanced life support. Resusci-

tation. 2015; 95: 100–147, doi: 10.1016/j.resuscitation.2015.07.016, indexed in Pubmed: 26477701.

4. Madziała M. The ETView tracheoscopic ventilation tube for trauma patient intubation. Disaster and Emergency Medicine Journal. 2018; 3(2): 69–70, doi: 10.5603/demj.2018.0016.
5. von Rüden C, Bühren V, Perl M. Polytrauma Management — Treatment of Severely Injured Patients in ER and OR. Z Orthop Unfall. 2017; 155(5): 603–622, doi: 10.1055/s-0042-124275, indexed in Pubmed: 29050055.
6. Adnet F, Racine SX, Borron SW, et al. A survey of tracheal intubation difficulty in the operating room: a prospective observational study. Acta Anaesthesiol Scand. 2001; 45(3): 327–332, indexed in Pubmed: 11207469.
7. Ladny JR, Smereka J, Szarpak L. Comparison of the Trachway video intubating stylet and Macintosh laryngoscope for endotracheal intubation. Preliminary data. Am J Emerg Med. 2017; 35(4): 574–575, doi: 10.1016/j.ajem.2016.12.015, indexed in Pubmed: 27986336.
8. Gaither JB, Spaite DW, Stolz U, et al. Prevalence of difficult airway predictors in cases of failed prehospital endotracheal intubation. J Emerg Med. 2014; 47(3): 294–300, doi: 10.1016/j.jemermed.2014.04.021, indexed in Pubmed: 24906900.
9. Satyadas T, Nasir N, Erel E, et al. Iatrogenic tracheal rupture: a novel approach to repair and a review of the literature. J Trauma. 2003; 54(2): 369–371, doi: 10.1097/01.TA.0000031940.95165.FE, indexed in Pubmed: 12579068.
10. Kurowski A, Szarpak Ł, Zaśko P, et al. Comparison of direct intubation and Supraglottic Airway Laryngopharyngeal Tube (S.A.L.T.) for endotracheal intubation during cardiopulmonary resuscitation. Randomized manikin study. Anaesthesiol Intensive Ther. 2015; 47(3): 195–199, doi: 10.5603/AIT.2015.0031, indexed in Pubmed: 26165236.
11. Cobas MA, De la Peña MA, Manning R, et al. Prehospital intubations and mortality: a level 1 trauma center perspective. Anesth Analg. 2009; 109(2): 489–493, doi: 10.1213/ane.0b013e3181aa3063, indexed in Pubmed: 19608824.
12. Mort TC. Emergency tracheal intubation: complications associated with repeated laryngoscopic attempts. Anesth Analg. 2004; 99(2): 607–13, table of contents, doi: 10.1213/01.ANE.0000122825.04923.15, indexed in Pubmed: 15271750.
13. Gawel W, Kaminska H, Wieczorek W. Uescope as a method of endotracheal intubation of trauma patient. Disaster Emerg Med. 2017; 2(4): 175–176, doi: 10.5603/DEMJ.2017.0040.
14. Nouruzi-Sedeh P, Schumann M, Groeben H. Laryngoscopy via Macintosh Blade versus GlideScope. Anesthesiology. 2009; 110(1): 32–37, doi: 10.1097/aln.0b013e318190b6a7.
15. Wojewodzka-Zelezniakowicz M, Madziala A, Madziala M. Comparison of the Miller and Macintosh laryngoscopes in simulated pediatric trauma patient: a pilot study. Disaster Emerg Med J . 2017; 2(1): 1–6, doi: 10.5603/DEMJ.2017.0001.
16. Klosiewicz T, Sip M, Zalewski R, et al. Alternative to endotracheal intubation for paramedicss in order to provide direct laryngoskopy. A randomized manikin trial. Disaster Emerg Med J. 2017; 2(3): 142–144, doi: 10.5603/DEMJ.a2017.0032.
17. Shravanalakshmi D, Bidkar PU, Narmadalakshmi K, et al. Comparison of intubation success and glottic visualization using King Vision and C-MAC videolaryngoscopes in patients with cervical spine injuries with cervical immobilization: A randomized clinical trial. Surg Neurol Int. 2017; 8: 19, doi: 10.4103/2152-7806.199560, indexed in Pubmed: 28217398.
18. Kleine-Brueggeney M, Buttenberg M, Greif R, et al. Evaluation of three unchannelled videolaryngoscopes and the Macintosh laryngoscope in patients with a simulated difficult airway: a randomised, controlled trial. Anaesthesia. 2017; 72(3): 370–378, doi: 10.1111/anae.13714, indexed in Pubmed: 27882535.
19. Smereka J, Ladny JR, Naylor A, et al. C-MAC compared with direct laryngoscopy for intubation in patients with cervical spine immobilization: A manikin trial. Am J Emerg Med. 2017; 35(8): 1142–1146, doi: 10.1016/j.ajem.2017.03.030, indexed in Pubmed: 28341185.
20. Smereka J, Czyzewski L, Szarpak L, et al. Comparison between the TrueView EVO2 PCD and direct laryngoscopy for endotracheal intubation performed by paramedics: Preliminary data. Am J Emerg Med. 2017; 35(5): 789–790, doi: 10.1016/j.ajem.2016.11.063, indexed in Pubmed: 27916466.
21. Sierzantowicz R, Dabrowska A, Dabrowski M, et al. ETView® video-tube versus Intubrite® laryngoscope for endotracheal intubation during CPR. Am J Emerg Med. 2017; 35(9): 1367–1368, doi: 10.1016/j.ajem.2017.03.006, indexed in Pubmed: 28274710.
22. Wolf LE, Aguirre JA, Vogt C, et al. Transfer of skills and comparison of performance between king vision® video laryngoscope and macintosh blade following an AHA airway management course. BMC Anesthesiol. 2017; 17(1): 5, doi: 10.1186/s12871-016-0296-9, indexed in Pubmed: 28125969.
23. Alvis BD, Hester D, Watson D, et al. Randomized controlled trial comparing the McGrath MAC video laryngoscope with the King Vision video laryngoscope in adult patients. Minerva Anestesiol. 2016; 82(1): 30–35, indexed in Pubmed: 25881731.
24. Eismann H, Sieg L, Etti N, et al. Improved success rates using videolaryngoscopy in unexperienced users: a randomized crossover study in airway manikins. Eur J Med Res. 2017; 22(1): 27, doi: 10.1186/s40001-017-0268-7, indexed in Pubmed: 28797305.
25. Rendeki S, Keresztes D, Woth G, et al. Comparison of VividTrac®, Airtraq®, King Vision®, Macintosh Laryngoscope and a Custom-Made Videolaryngoscope for difficult and normal airways in mannequins by novices. BMC Anesthesiol. 2017; 17(1): 68, doi: 10.1186/s12871-017-0362-y, indexed in Pubmed: 28549421.
26. Ndoko SK, Amathieu R, Tual L, et al. Tracheal intubation of morbidly obese patients: a randomized trial comparing performance of Macintosh and Airtraq laryngoscopes. Br J Anaesth. 2008; 100(2): 263–268, doi: 10.1093/bja/aem346, indexed in Pubmed: 18211999.
27. Gaszynski T. TotalTrack video intubating laryngeal mask in super-obese patients - series of cases. Ther Clin Risk Manag. 2016; 12: 335–338, doi: 10.2147/TCRM.S95695, indexed in Pubmed: 27042078.

VIA MEDICA

CASE REPORT

Disaster and Emergency Medicine Journal
2018, Vol. 3, No. 3, 101–105
DOI: 10.5603/DEMJ.2018.0022

ISSN 2451–4691

PNEUMOMEDIASTINUM AND PNEUMORETROPERITONEUM AS A RESULT OF MEPHEDRONE INTOXICATION — A CASE REPORT.

Perdyan Adrian[1] / Piątkowska Anna[1], Spychalski Piotr[2], Łaski Dariusz[2], Łachiński Andrzej J[2], Kobiela Jarek[2]

[1] Surgical Scientific Circle, Department of General, Endocrine and Transplant Surgery, Medical University of Gdansk, Poland
[2] Department of General, Endocrine and Transplant Surgery, Medical University of Gdansk, Poland

Abstract

INTRODUCTION: Presence of air in mediastinal space, retroperitoneal space or subcutaneously is a rare condition in majority caused by trauma of airway or gastrointestinal (GI) tract. Rarely can it occur as a consequence after drug usage.

CASE PRESENTATION: We report a non-traumatic occurrence of pneumomediastinum, pneumoretroperitoneum and subcutaneous emphysema in a 27 year-old male patient who had been inhaling mephedrone for 4 days. Patient was admitted to Department of General, Endocrine and Transplant Surgery, Medical University of Gdansk. CT scans of neck, chest and abdomen were performed with suspicion of perforation of GI tract or airways. Perforation was excluded by gastroscopic and bronchoscopic examinations. Patient was treated conservatively with fluids and antibiotic therapy because of no abnormalities besides free air in mentioned cavities. During 6 days of hospitalization patient made a steady recovery and was discharged in good condition.

CONCLUSIONS: The presence of pneumomediastinum, pneumoretroperitoneum and subcutaneous emphysema associated with mephedrone inhalation has been rarely reported in the literature in the past. There are only a few cases describing such complications and medical management required. By reporting this case we would like to emphasize that mentioned symptoms and history of drug use might seem life-threatening, however, this condition may be self-limiting as well. Therefore, good general state can potentially be indication for a watch-and-wait approach with no surgical intervention necessary.

KEY WORDS: spontaneous pneumomediastinum, pneumoretroperitoneum, subcutaneous emphysema, drug abuse, mephedrone

Disaster Emerg Med J 2018; 3(3): 101–105

INTRODUCTION

A presence of free air in mediastinal space (pneumomediastinum) and in retroperitoneal space (pneumoretroperitoneum) can manifest as tachycardia and chest pain and may need prompt diagnostics and treatment. Trauma, foreign bodies and drug intoxication are some of the potential causes of these phenomena (Tab. 1, Tab. 2). The latter one most frequently occur in young individuals, especially males [1]. Among vast variety of drugs that can lead to SPM (spontaneous pneumomediastinum) stimulants, drugs such as cocaine are usually responsible

ADDRESS FOR CORRESPONDENCE:
Adrian Perdyan, Medical Student, Surgical Scientific Circle, Department of General, Endocrine and Transplant Surgery
Medical University of Gdansk, Poland; 3A Sklodowskiej Str.; 80–210 Gdansk, Poland
e-mail: aditre532@gmail.com; tel: +48 503 131 881

Table 1. Potential causes of Pneumoretroperitoneum

CAUSES OF PNEUMORETROPERITONEUM	MECHANISM
Disrupted alveoli	Air migrates via the loosely packed paraesophageal connective tissue across the diaphragm
Inflammatory Bowel Disease	Inflammation → perforation
Perforation of a duodenal ulcer	
Pneumatosis cystoids intestinalis	
Necrotizing fasciitis	
Abscess formation	
Ruptured appendix	
Foreign body	Rupture of bowel wall
Iatrogenic (PEG placement, ERCP, laparoscopic operations, sigmoidoscopy, colonoscopy, epidural anesthesia, barium enema)	

Table 2. Potential causes of Pneumomediastinum

CAUSES OF PNEUMOMEDIASTINUM	MECHANISM
Chest trauma	Increase of alveolar pressure → rupture of alveoli → releasing air → migration to the mediastinum through the peribronchial and perivascular sheaths
Pulmonary disease (asthma, COPD, respiratory infections)	Excessive coughing → rupture
Presence of foreign bodies in the airway, iatrogenic (artificial ventilation, bronchoscopy)	Rupture of airways wall
Use of recreational drugs	Inhalation → alveoli rupture
Childbirth, physical effort, excessive vomiting	Valsalva's maneuver

[2–3]. Mephedrone (4-methylmethcathinone) is relatively new synthetic cathinone common in recreational use [4]. It has stimulating effect similar to amphetamine (and derivatives) and cocaine. In this report we present a case of pneumomediastinum and pneumoretroperitoneum caused by mephedrone inhalation.

CASE PRESENTATION

27-years old male was admitted to emergency department with agitation and impaired verbal and logical contact, tachycardia and tachypnoea, throat ache and high body temperature (39.5°C). Subcutaneous emphysema of neck and chest was noted upon physical examination (Fig. 1A). The following vital signs and laboratory results were recorded: heart rate 78 bpm, blood pressure 140/60, CRP 186, elevated PCT and glucose level. Empirical antibiotic therapy (ceftriaxone + clarithromycin, fluconazole) was administered and later changed to piperacillin/tazobactam + metronidazole due to suspicion of GI perforation. Diagnostics were extended by neck, chest and abdomen contrast enhanced CT. Pneumomediastinum (Fig. 2A) and free air in both peritoneum and retroperitoneum were revealed (Fig. 3A). Police report stated that patient was using unknown drugs for past 4 days.

INVESTIGATION

Gastroscopy and bronchoscopy were performed to exclude the possible GI and airway perforation, however, no abnormalities were found. Initially, at admission, patient experienced delusions (i.e. delusions of reference, he believed that medical staff is working for the police). Normal verbal and logical contact was regained after 24 hours. After the patient regained full consciousness detailed interview was possible — patient admitted to inhaling mephedrone.

TREATMENT

The patient was treated medically. Antibiotic therapy and fluids were maintained during following 5 days of hospital stay. On the last day of hospitalization,

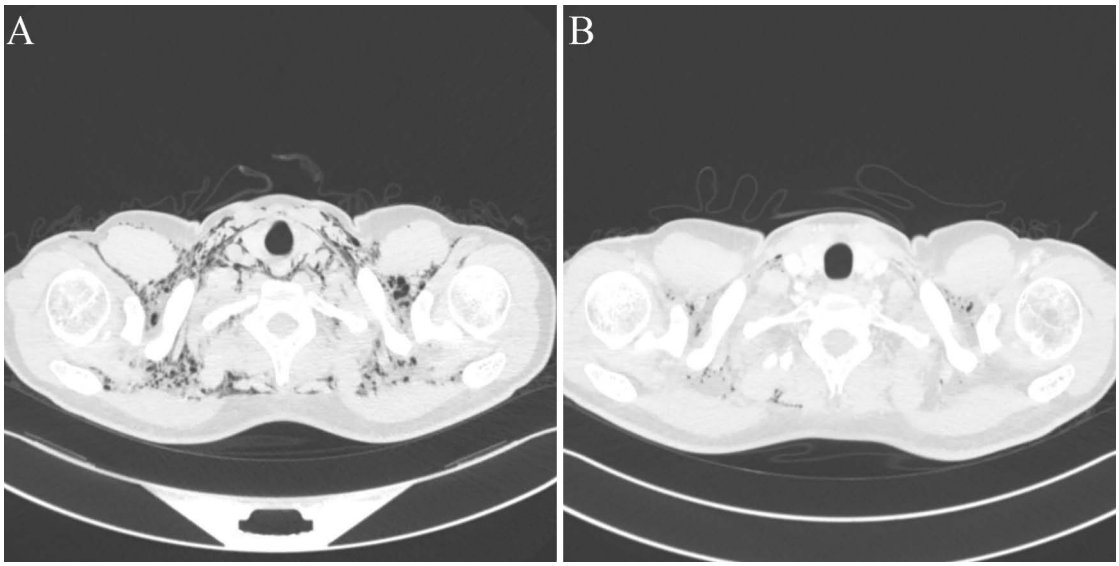

FIGURE 1. CT scan showing subcutaneous emphysema of neck — at diagnosis (A) and (B) before discharge

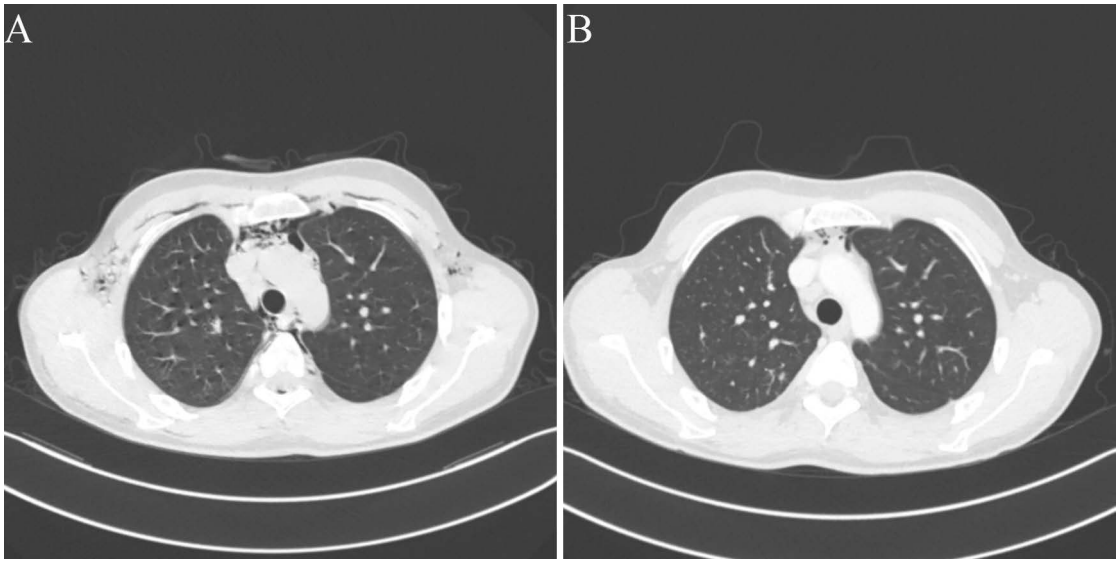

FIGURE 2. CT scan showing pneumomediastinum — at diagnosis (A) and (B) before discharge

a control CT of neck, chest, abdomen and pelvis was performed. The amount of free gas decreased in all locations (Fig.1–3B).

FOLLOW-UP AND OUTCOMES

Patient was discharged in good condition after 6 days. No adverse and unanticipated events were observed. Patient was not present on follow-up visits.

DISCUSSION

Pneumomediastinum, pneumoretroperitoneum and subcutaneous emphysema may be symptoms of either GI tract or airway perforation. These conditions are potentially life threatening and may need surgical intervention. However, as presented in this case they also may be rare and self-limiting complications of drugs inhalation, which can be treated medically under precise surveillance. Patients seeking aid in emergency department because of SPM were usually admitted with sudden chest pain and dyspnea. Upon exclusion of tension pneumothorax, these symptoms require performing diagnostics to elucidate the reason for presence of free air in and outside of body cavities. As mentioned before GI tract and airway perforation are some of differential diagnoses and may need surgical intervention or

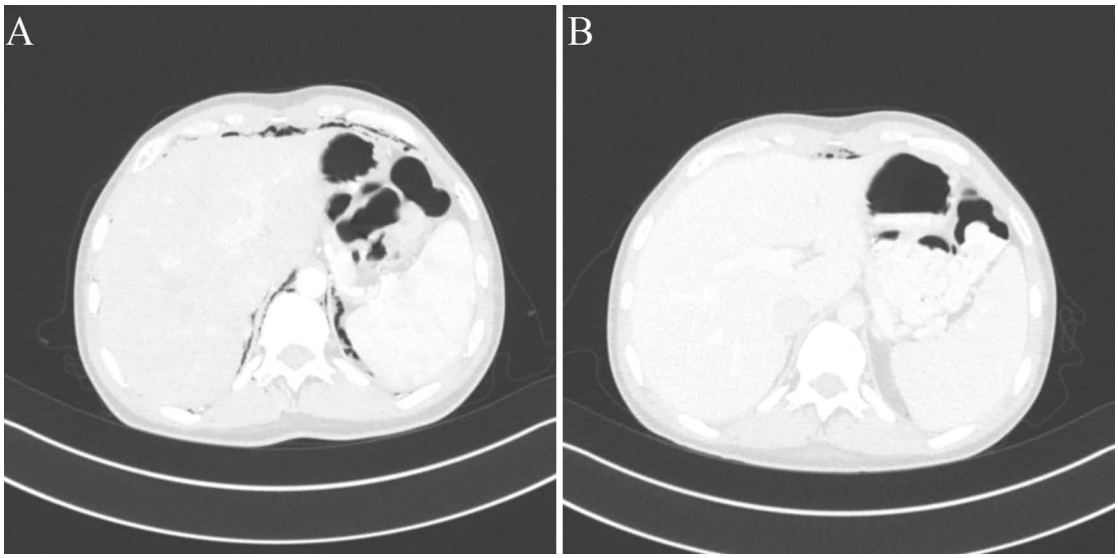

FIGURE 3. CT scan showing pneumoretroperitoneum — at diagnosis (A) and (B) before discharge

chest drainage. Bronchoscopy, gastroscopy, colonoscopy and computed tomography can potentially exclude these pathologies. Once these diagnoses are excluded SPM may be diagnosed.

Drugs, including cocaine, met(amphetamine), MDMA, marihuana and, as presented, mephedrone may cause SPM and consequently pneumomediastinum and subcutaneous emphysema [5, 6, 7, 8]. Probable explanation of development SPM as a result of inhalable drug use is that overly distended alveoli rupture under high pressure. Whenever the pressure gradient between the alveoli and the surrounding interstitial space is sufficient the free air then dissects from the ruptured alveoli along the bronchovascular sheaths toward the mediastinum, to produce SPM. This sequence of events is known as the "Macklin effect" which is a result of Valsava's maneuver [9]. Similar effect to Valsalva's maneuver occurs in Muller's maneuver in which chest pressure decreases in perialveolar spaces, and as a consequence, air moves to hypothetic perialveolar space, without penetration of pleura [10]. Furthermore, most probable mechanism of pneumoretroperitoneum occurrence is a translocation of free air form the chest to abdomen by aortic hiatus of the diaphragm. Subcutaneous emphysema is a rare condition that presents as a smooth bulging of the skin with a characteristic palpable crepitation. This can be traumatic, iatrogenic (puncture of the respiratory or GI tract) or spontaneous [11]. It can occur anywhere in the body but it is the most common in the head and neck region due to the proximity of the airways. Subcutaneous emphysema is not inherently life threatening and the air will be resorbed over time, but it can be uncomfortable for the patient.

Mephedrone (4-methylmethcathinone) is a relatively novel drug, with first reports of use from 2007. Since then, its use is increasing, especially in Europe [12]. It is a synthetic cathinone that has never been licensed as a medicine and no other legitimate uses are known. The effects and the mode of use have similarities with (meth)amphetamine, cocaine and 3,4-methylenedioxymethylamphetamine (MDMA), but its potency is lesser than (meth) amphetamine [4]. Mephedrone can be administered via oral route, nasal insufflation, intramuscular injection, intravenous injection and rectal insertion. The predominant routes are oral ingestion and nasal insufflation [12]. The most common clinical features concerning mephedrone use are agitation, aggression, tachycardia, anxiety, confusion, psychosis and chest pain, however, it may also have no symptoms [2, 3]. Our patient presented majority of mentioned symptoms including rare ones such as SPM and retroperitoneum.

Most challenging obstacle in this case was the lack of knowledge on the type of substance that the patient was using. Impaired logical contact along with the fact that mephedrone does not come positive on the standard tox-screen delayed precise diagnosis. However, this was not crucial for the treatment, as endoscopic and radiologic examinations confirmed SPM and along with good general condition enabled medical treatment.

In conclusion, SPM caused by drug abuse usually is a benign condition which does not require surgical intervention nor chest drainage. Patient diagnosed with SPM that is in good general condition, with positive drug abuse history and no apparent perforation of airways or GI, should be treated conservatively.

LEARNING POINTS

1. Pneumoretroperitoneum is rare and usually benign complication of drugs inhalation
2. SPM and pneumoretroperitoneum can be treated medically under precise surveillance
3. Self-resolution of these pathologies should be expected

Source of funding — department funding.

Conflict of interest statement: Med. Stud. Perdyan has nothing to disclose. Med. Stud. Piątkowska has nothing to disclose. Dr. Łaski has nothing to disclose. Dr. Spychalski has nothing to disclose. Prof. Łachiński has nothing to disclose. Dr. Kobiela has nothing to disclose.

REFERENCES

1. Graham R, Bowen N, Singh J. Mephedrone inhalation causes pneumomediastinum. BMJ Case Rep. 2014; 2014, doi: 10.1136/bcr-2014-203704, indexed in Pubmed: 24614784.
2. Kouritas VK, Papagiannopoulos K, Lazaridis G, et al. Pneumomediastinum. J Thorac Dis. 2015; 7(Suppl 1): S44–S49, doi: 10.3978/j.issn.2072-1439.2015.01.11, indexed in Pubmed: 25774307.
3. James D, Adams RD, Spears R, et al. Clinical characteristics of mephedrone toxicity reported to the U.K. National Poisons Information Service. Emerg Med J. 2011; 28(8): 686–689, doi: 10.1136/emj.2010.096636, indexed in Pubmed: 20798084.
4. Best W, Bodenschatz C, Beran D. Mephedrone: Critical Review Report from the Expert Committee on Drug Dependence Thirty-sixth Meeting (Agenda item 4.12). World Health Organization. 2014: 1–34.
5. Rejali D, Glen P, Odom N. Pneumomediastinum following ecstasy (methylenedioxymetamphetamine, MDMA) ingestion in two people at the same ‚rave'. J Laryngol Otol. 2002; 116(1): 75–76, indexed in Pubmed: 11860664.
6. Kloss BT, Broton CE, Rodriguez E. Pneumomediastinum from nasal insufflation of cocaine. Int J Emerg Med. 2010; 3(4): 435–437, doi: 10.1007/s12245-010-0205-9, indexed in Pubmed: 21373317.
7. Hazouard E, Koninck JC, Attucci S, et al. Pneumorachis and pneumomediastinum caused by repeated Müller's maneuvers: complications of marijuana smoking. Ann Emerg Med. 2001; 38(6): 694–697, doi: 10.1067/mem.2001.118016, indexed in Pubmed: 11719752.
8. Albanese J, Gross C, Azab M, et al. Spontaneous pneumomediastinum: A rare complication of methamphetamine use. Respir Med Case Rep. 2017; 21: 25–26, doi: 10.1016/j.rmcr.2017.03.007, indexed in Pubmed: 28348951.
9. Romero KJ, Trujillo MH. Spontaneous pneumomediastinum and subcutaneous emphysema in asthma exacerbation: The Macklin effect. Heart Lung. 2010; 39(5): 444–447, doi: 10.1016/j.hrtlng.2009.10.001, indexed in Pubmed: 20561891.
10. Maunder RJ, Pierson DJ, Hudson LD. Subcutaneous and mediastinal emphysema. Pathophysiology, diagnosis, and management. Arch Intern Med. 1984; 144(7): 1447–1453, indexed in Pubmed: 6375617.
11. Maan ZN, D'Souza AR. Spontaneous subcutaneous emphysema associated with mephedrone usage. Ann R Coll Surg Engl. 2012; 94(1): e38–e40, doi: 10.1308/003588412X13171221499108, indexed in Pubmed: 22524925.
12. EMCDDA. Report on the risk assessment of mephedrone in the framework of the Council Decision on new psychoactive substances. European Monitoring Centre for Drugs and Drug Addiction. Luxembourg, Office for Official Publications of the European Communities. 2011, doi: 10.2810/40800.

VIA MEDICA

LETTER TO THE EDITOR

Disaster and Emergency Medicine Journal
2018, Vol. 3, No. 3, 106–107
DOI: 10.5603/DEMJ.2018.0023

ISSN 2451–4691

SUPRAGLOTTIC AIRWAY DEVICES – A CONCEIT OR THE FUTURE OF AIRWAY MANAGEMENT?

Togay Evrin[1], Mikolaj Rusin[2], Dawid Kacprzyk[2], Katarzyna Wieczorek[2], Klaudia Kulak[2], Marek Malysz[2]

[1] Department of Emergency Medicine, UFuK University Medical Faculty, Ankara, Turkey
[2] Lazarski University, Warsaw, Poland

Disaster Emerg Med J 2018; 3(3): 106–107

Dear Sir,

With great interest we read an article by Frass et al. entitled "Securing the airway patency by firefighters with the use of CombiTube. A pilot data" [1]. In this study, the authors present the effectiveness of airway management with the use of CombiTube by firefighters. According to numerous studies, the learning curve of supraglottic ventilation devices is significantly shorter than that of direct laryngoscopy [2, 3]. The history of supraglottic airway devices (SADs) dates back to the early 1980s. Since then, many types of these devices have appeared on the medical market and have undergone various modifications, an example of which is the fact that we can now purchase the third generation of SADs (Fig. 1). The initial devices, as was the case with the standard laryngeal mask (LMA), were composed of a ventilation channel and a sealing mask, however, the latest family of devices was additionally equipped with channels allowing the introduction of a catheter and decompression of the stomach from excess air or gastric contents.

Over the last decades, these devices have been used not only in emergency medicine, but also to protect the airway during short surgical procedures [4].

An update of the American Heart Association (AHA) resuscitation guidelines as well as the European Resuscitation Council (ERC) guidelines indicated supraglottic airway devices as a method of airway management during cardiopulmonary resuscitation. If the device is introduced into the airways, it is necessary to verify its correct position and airway protection, followed by auscultating upper abdomen, while chest compressions are being carried out.

This procedure is designed to prevent air leaks in the event of increased chest pressure — as is the case with chest compressions. If the person auscultating the upper abdomen does not hear murmurs suggesting air leaks, asynchronous cardiopulmonary resuscitation is permitted [3]. As indicated by numerous studies supraglottic airway devices can be used with high efficiency after a short training, so that they can be used, among others, by the firefighters mentioned by Frass et al. or nurses [1]. This makes it possible to protect the airway while performing an uninterrupted chest compression, which minimizes the length of the break during which the chest is not compressed. An additional aspect of using supraglottic airway devices is the possibility of using them in cases where access to the airways is limited, which precludes endotracheal intubation, as is often the case with patients trapped in a vehicle [5–7]. Therefore, it can be assumed that SADs are universal methods of airway protection, providing an important alternative for personnel without adequate experience in endotracheal intubation.

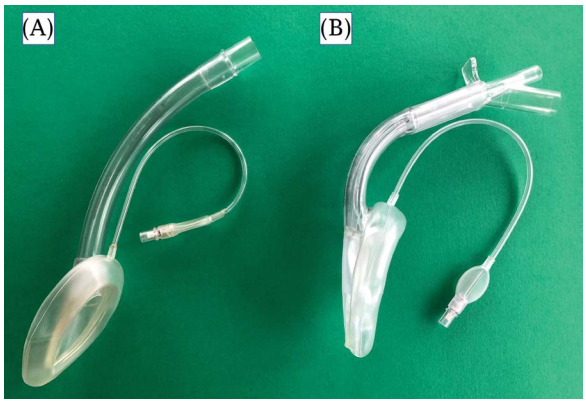

FIGURE 1. Laryngeal mask airway: A) 1-st generation LMA Unique (Laryngeal Mask Company Limited); B) 3-rd generation LMA Supreme (Teleflex)

ADDRESS FOR CORRESPONDENCE:
Marek Malysz, Lazarski University, 43 Swieradowska Str., 02–662 Warsaw, Poland
e-mail: malysz.marek@gmail.com

REFERENCES

1. Frass M, Robak O, Smereka J, et al. Securing the airway patency by firefighters with the use of CombiTube. A pilot data. Disaster Emerg Med J. 2018; 3(2): 46–50, doi: 10.5603/demj.2018.0011.
2. Sorbello M, Petrini F. Supraglottic Airway Devices: the Search for the Best Insertion Technique or the Time to Change Our Point of View? Turk J Anaesthesiol Reanim. 2017; 45(2): 76–82, doi: 10.5152/TJAR.2017.67764, indexed in Pubmed: 28439437.
3. Sip M, Dabrowska A, Prucnal K, et al. Supraglottic devices — future or everyday life? Disaster Emerg Med J 2017;2(2):74-83. Disaster Emerg Med J. 2017; 2(2): 74–83, doi: 10.5603/DEMJ.2017.0015.
4. Robak O, Vaida S, Somri M, et al. Inter-center comparison of EasyTube and endotracheal tube during general anesthesia in minor elective surgery. PLoS One. 2017; 12(6): e0178756, doi: 10.1371/journal.pone.0178756, indexed in Pubmed: 28575056.
5. Szarpak Ł, Truszewski Z, Smereka J, et al. Are paramedics able to perform endotracheal intubation with access to the patient through the back seat of the car? Randomized crossover manikin study. Am J Emerg Med. 2016; 34(6): 1161–1163, doi: 10.1016/j.ajem.2016.02.062, indexed in Pubmed: 27079500.
6. Madziala A, Galazkowski R, Kaminska H, et al. Comparison of the airway access skills of medical students in cardiopulmonary resuscitation simulation: a randomized crossover study. Post N Med . 2018; XXXI(1): 42–47, doi: 10.25121/PNM.2018.31.1.42.
7. Madziala A, Evrin T, Wieczorek W, et al. et al.. Can the face-to-face intubation technique be used during cardiopulmonary resuscitation? A prospective, randomized, crossover manikin trial. Disaster Emerg Med J. 2017; 2(4): 145–149, doi: 10.5603/DEMJ.2017.0033.

VIA MEDICA

LETTER TO THE EDITOR

Disaster and Emergency Medicine Journal
2018, Vol. 3, No. 3, 108–109
DOI: 10.5603/DEMJ.2018.0024

ISSN 2451–4691

PLACE OF CERVICAL COLLAR IN EMERGENCY MEDICINE

Ruslan Yakubtsevich[1], Dominika Dunder[2], Kacper Kranc[2], Michal Pruc[2], Adam Pastucha[2], Aleksandra Koldyj[2]

[1] Department of Anesthesiology and Intensive Care Grodno State Medical University, Grodno, Belarus
[2] Lazarski University, Warsaw, Poland

Disaster Emerg Med J 2018; 3(3): 108–109

Dear Sir,

We have read the article by Ladny et al. titled „Assessment of the cervical collar application impact on the conditions of intubation and the feelings of patients — pilot study" [1] with great interest. In this article, the main concern raised by the authors is — the use of cervical collar among patients with suspected cervical spine injuries in the outpatient settings. Until recently, the use of cervical collar was a golden standard during emergencies for trauma patients as well as the use of an orthopedic board [2, 3].

However, due to the numerous articles, including the article by Bledsoe, which was published in the Journal of Emergency Medical Services [4], the use of a cervical collar is currently being questioned. Bledsoe emphasizes several reasons why the routine use of cervical collar should be limited [4]. The first is the risk of aggravating an injury due to incorrect use of a cervical collar by untrained personnel. The application of a cervical collar should be performed after previous training and in accordance with the manufacturer's instructions (Fig. 1). The second obstacle is the possibility of exacerbating pain which can be caused by excessive pressure of the collar on the mastoid processes. Another hindrance is the reduction of the effectiveness of endotracheal intubation, in case of wearing the cervical collar, which reduces

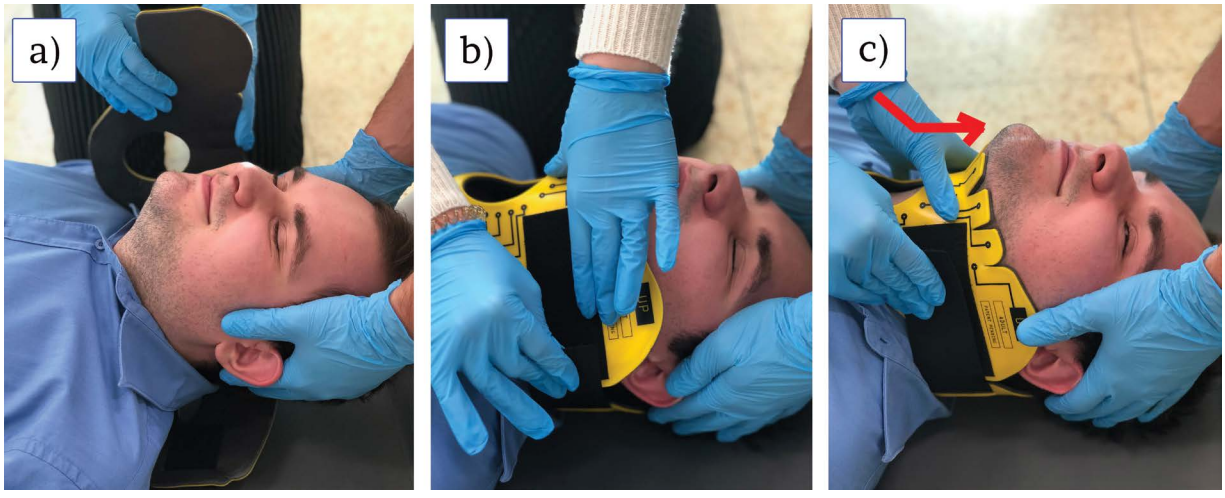

FIGURE 1. Correct application of cervical collar: a) Slide the back of the collar, with the elliptic hole, behind the patient's neck. Continue pushing beneath the patient until you can reach it on the opposite side; b) Wrap the front side around the lower jaw, aligning the oval hole under the chin. Secure the collar tightly around the patient's neck using the Velcro strap; c) Push the small wings against the chin and check that they are in a supportive position. Adjust the collar into a position that immobilizes the neck of the patient and readjust the Velcro strap if necessary.

ADDRESS FOR CORRESPONDENCE:
Dominika Dunder, Lazarski University, Warsaw, Poland
e-mail: sjc.lazarski@gmail.com

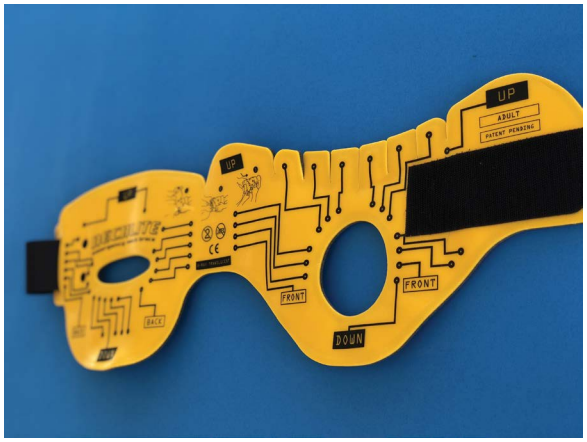

FIGURE 2. The NECKLITE emergency neck brace.

the extension of the oral cavity opening. The fourth and the most crucial complication that can be caused by the cervical collar is the pressure on the external jugular veins that may lead to elevated intracranial pressure, which is already increased in patients suffering from craniocerebral trauma and can expose them to life-threatening situations. Moreover, Hoffman et al. [5] indicate that conscious patients with normal verbal-logic speech have a low probability of experiencing serious complication of the cervical spine.

However, according to research carried out by Ladny et al. there is an alternative to the regular cervical collars, in the form of NECKLITE emergency neck brace (FLAMOR SL, San Pietro Mosezzo, Italy; Fig. 2). The collar is an innovative solution, thanks to its construction it provides a moldable fit to the individual patient and thus stabilization of the cervical spine is well-defined while reducing the pain. Ladny et al. indicated that the extent of the oral cavity opening was varied in three cases: without a collar, with AMBU collar, and with NECKLITE collar. Nonetheless, during the measurement, they detected only a minimal change in the degree of the dilation between collar-free and NECKLITE.

In another research, Szarpak et al. [6] indicated that the sheath thickness of the median optic nerve during the follow-up was 3.6 (3.58–3.95) mm, while 10 minutes after immobilizing the cervical spine using a NECKLITE collar was 3.75 (3.7–4.2) mm, and in the case of stabilizing the spine using a Patriot collar — 4.6 (IQR: 4.35–4.9) mm. In terms of physiology and pathophysiology, emergency procedures with patients suffering from craniocerebral injuries include actions that aim to prevent an increase of intracranial pressure, however, as research by Szarpak et al. [6] as well as Maissan et al. [7] shows that use of standard cervical collars may cause a significant elevation of intracranial pressure.

In the case of patients with craniocerebral injuries, there is a tendency for increased intracranial pressure, which in critical situations may lead to brainstem herniation through the foramen magnum and eventually patient's death.

To sum up, regarding patient protection, further research is necessary to verify the results that were obtained in the studies mentioned above.

REFERENCES:

1. Ladny M, Smereka J, Szarpak L, et al. Assessment of the cervical collar application impact on the conditions of intubation and the feelings of patients — pilot study. Disaster Emerg Med J . 2018; 3(1): 1–4, doi: 10.5603/DEMJ.2018.0001.
2. Wölfl CG, Gliwitzky B, Wentzensen A. Standardised primary care of multiple trauma patients. Prehospital Trauma Life Support und Advanced Trauma Life Support. Unfallchirurg. 2009; 112(10): 846–853, doi: 10.1007/s00113-009-1685-z, indexed in Pubmed: 19756451.
3. Wiles MD. ATLS: Archaic Trauma Life Support? Anaesthesia. 2015; 70(8): 893–897, doi: 10.1111/anae.13166, indexed in Pubmed: 26152249.
4. Bledsoe B. Why EMS should limit the use of rigid cervical collars. JEMS. https://www.jems.com/articles/print/volume-40/issue-2 (20.11.2018).
5. Hoffman JR, Wolfson AB, Todd K, et al. Selective cervical spine radiography in blunt trauma: methodology of the National Emergency X-Radiography Utilization Study (NEXUS). Ann Emerg Med. 1998; 32(4): 461–469, indexed in Pubmed: 9774931.
6. Szarpak L, Ladny M, Pyda S, et al. Comparison of two cervical collars on the intracranial pressure measured indirectly based on the thickness of the optic nerve sheath. Preliminary data. Post N Med . 2018; XXXI(2): 68–71, doi: 10.25121/PNM.2018.31.2.68.
7. Maissan IM, Ketelaars R, Vlottes B, et al. Increase in intracranial pressure by application of a rigid cervical collar: a pilot study in healthy volunteers. Eur J Emerg Med. 2018; 25(6): e24–e28, doi: 10.1097/MEJ.0000000000000490, indexed in Pubmed: 28727580.

Forum Medycyny Rodzinnej — Konferencja Czasopisma Forum Medycyny Rodzinnej

Gdańsk, 28–29 czerwca 2019 roku

Przewodniczący Komitetu Naukowego:
prof. dr hab. n. med. Janusz Siebert

Szczegółowe informacje oraz rejestracja:

www.medycynarodzinna.viamedica.pl

Konferencja jest skierowana do wszystkich osób zainteresowanych tematyką. Sesje satelitarne firm farmaceutycznych, sesje firm farmaceutycznych oraz wystawy firm farmaceutycznych są skierowane tylko do osób uprawnionych do wystawiania recept lub osób prowadzących obrót produktami leczniczymi — podstawa prawna: Ustawa z dnia 6 września 2001 r. Prawo farmaceutyczne (Dz. U. z 2017 r. poz. 2211, z późn. zm.)

ORGANIZATOR
VIA MEDICA

PATRONAT

PATRONAT MEDIALNY
tvmed

PARTNER
ilkamed.pl

18-0181.001.011