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Epidemiological assessment of maxillofacial fractures in the inhabitants of Lower Silesia, Poland in 2002–2006 – Pattern of maxillofacial fracture

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ABSTRACT

Introduction: This study is a continuation of research on maxillofacial traumatology conducted by the Maxillofacial Surgery Department of the Medical University in Wrocław, Poland. Since 1956, a statistical review of maxillofacial fractures has been kept in 5 or 10-year periods of reference. Such an analysis is useful in identifying the frequency of the phenomenon, deciding on suitable treatment precautions, verifying treatment methods, and analyzing costs and losses incurred as a result of absence at work due to maxillofacial fractures. The sociological aspect of these studies includes indicating the sources of adverse social phenomena.
Aim: The aim of this epidemiological study was to analyze maxillofacial fractures among the inhabitants of Lower Silesia treated in the Maxillofacial Surgery Department of Wrocław Medical University in 2002–2006.
Material and methods: The study was based on clinical documentation of 937 patients in whom dependencies between chosen parameters were identified. To evaluate the type of fracture, the classification of fractures developed by Samolczyk-Wanyura was adopted.
Results and discussion: The most common causes of fractures in both sexes were assaults (57.1%) and motor vehicle accidents (16.8%). Almost 50% fewer fractures were work related in comparison with other authors' data from previous years, and the greatest number of maxillofacial fractures was reported in young males from urban backgrounds aged 18–25. The most frequent type of fracture was mandibular fracture.
Conclusions: It was concluded that the main causes of maxillofacial fractures were related with assault and motor vehicle accidents. This means that violence is a very serious social problem.

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1. Introduction

A faster pace of life, dynamic development of the automotive industry, rapid growth in the number of car owners and a dramatic increase in incidents of violent assault are the causes of considerable growth in maxillofacial injuries. Maxillofacial skeleton fractures are the most common among these injuries.[1] Young people have become more aggressive and they are consuming more alcoholic beverages; it leads to more assaults the victims of which are usually young males aged under 30.[2] Apart from typical maxillofacial injuries with low kinetic energy, incidents of maxillofacial bones fractures caused by guns and pneumatic weapons which are part of criminal activities are becoming more and more frequent.[3] Technological advancement and rapid development of mechanization in many fields of life have caused the increase in the number of maxillofacial injuries both at home and at work.[4]

Another cause of fractures is falls from height. Growing popularity of mass sports closely correlates with the increasing number of fractures in the maxillofacial area caused by lack of proper head protection, as well as by inappropriate or hazardous behavior. In the case of children, maxillofacial fractures are usually a result of participation in kinetic games, falling off the bike, falling on a hard surface, being hit by a swing, hitting against a table corner or a door handle, or being hit by a motor vehicle.[5] Among people aged over 70, the most common cause is falling down the stairs or hitting a hard surface due to balance problems. In such cases, the condition of bone tissue is really important as age-related bone changes make it more prone to fractures.

The least frequent causes include iatrogenic injuries caused by dental treatments i.e. root canal treatment, trismus treatments or cyst removal.[6] Falling on a hard surface during an epilepsy seizure, which occurs with the frequency of 40–70 incidents per 100 000 citizens in developed countries, is a common cause of maxillofacial fractures.[7]

Numerous attempts to classify maxillofacial fractures have been made. The first and still the most popular classification of maxillofacial fractures is Le Fort classification created in 1901.[8] Even though Le Fort classification is simple and practical, it is not always commensurate with current multi-organ injuries that are close to the maxillofacial skeleton, and in case of which numerous dislocations and bone defects may be found only intraoperatively. Additionally, it does not include alveolar process fractures and midline fractures.

Only clinical classification of maxillofacial fractures that includes accompanying soft tissue injuries, morphological and functional complications and general condition of the patient compensates for the shortcoming of Le Fort fracture classification. Among such classifications, those known from Polish literature, e.g. Perczyńska-Partyka and Samolczyk-Wanyura may be mentioned.[9] The latter one includes clinical anatomopathological fractures of the upper face region and it is based on the anatomical and architectural structure of the maxillofacial skeleton, the injury mechanism, the intraoperative image of neighboring soft tissue damage, as well as accompanying morphological and functional complications. Based on this classification, a computer program with a central register of maxillofacial injuries has been created. At the same time, it was suggested that different maxillofacial surgery centers should keep a register that would contain injury circumstances, a detailed description of the fracture, coexistent injuries, complications and treatment methods. It was assumed that such a central register based on one classification would facilitate information exchange between the centers and standardization of treatment methods.

2. Aim

The aim of this epidemiological study was to analyze maxillofacial fractures in the inhabitants of Lower Silesia treated in the Maxillofacial Surgery Department of Wrocław Medical University in 2002–2006.

3. Material and methods

The analyzed group was selected among 6012 patients hospitalized in the Maxillofacial Surgery Department of Wrocław Medical University in years 2002–2006. Before conducting the study, the authors obtained appropriate permits to use medical documentation of patients with maxillofacial fractures treated in the clinic from the Commission of Bioethics at Wrocław Medical University (KB – 235/2008).

Medical documentation of 937 patients with maxillofacial fractures was used. To classify craniofacial skeleton fractures, the Samolczyk-Wanyura classification was applied. Demographic data of the subjects was evaluated. The dependencies between a greater number of incidents and the season, the fracture cause and their dependence on sex and age were established.

To fulfill the abovementioned tasks, all of the data acquired from the case history cards was entered into a spreadsheet. Afterwards, the data was analyzed statistically in accordance with standard methodology used in medical science (Statistica 9.0). As the basic method of analyzing variable interdependencies in this study, the χ^2 test of independence was used.

In the statistical part of the research, to evaluate dependencies between the dependent variable and the independent variable, the authors applied the χ^2 test. To measure the strength of dependencies for nominal features, the contingency coefficient C was used. All χ^2 tests were done at the statistical significance level of $\alpha = 0.05$. There were instances where empirical data was incomplete. This very reason influenced the tables where deviations in samples collected from 937 people may be found. This does not result from a mistake, but, as mentioned before, from incomplete data. Since the analyzed sample of people is numerous, such lack of data influences the second or third decimal digit in the calculated χ^2 statistics. The analysis may be assumed as reliable. To relate the results to the general population, interpretations were made on the basis of percentage indicators (%).

The classification of maxillofacial fractures according to Samolczyk-Wanyura[10] includes:

(1) **facial upper massive fractures:** cranio-orbitonasal fractures (CONF), cranio-orbital fractures (COF), orbitonasal displacement (OND), upper face massive dislocations (UFMD), isolated orbital floorfractures (IOFF), zygomatico-orbital fractures (ZOF), zygomatico-maxillary-orbital fractures (ZMOF); and
(2) **facial lower massive fractures:** mandibular corpus fractures (MCF), mandibular angle fractures (MAF), mandibular ramus fractures (MRF), mandibular condylar process fractures (MCDYPF), mandibular coronoid process fractures (MCPF).

4. Results

In years 2002–2006, 5 982 patients were hospitalized in the Maxillofacial Surgery Department of Wrocław Medical University, 937 patients were treated because of craniofacial bones fractures. This number comprises 15.7% of all the patients staying at the clinic at that time. In 2004 the number of patients was the highest (263), whereas in 2006 it was the lowest (153). In other years the percentage of patients treated due to craniofacial fractures ranged from 18.0% to 21.8%. The majority of them were males (more than 85%). Among all hospitalized females, the fewest (12.8%) were injured in 2003 and the most (25.6%) in 2004. Among males, the fewest (16.3%) were injured in 2006 and the most (25.1%) in 2004. In the remaining years, the percentage was 20.0% in both groups.

People aged 18–25 are the most susceptible to injuries (34.6%) and 41–50 (19.3%). The least frequently hospitalized age groups were: above 60 (3.6%), under 18 (6.6%) and above 51 (7.0%). Since there are more males, this percentage is compliant with the profile of injuries for this sex. Nevertheless, among females the greatest number of fractures (27.1%) was in the age group 31–40, then 18–25 (17.3%) and 41–50 (16.5%). In the remaining age groups it was 9.0–10.0%.

In the analyzed group, 74.0% of the patients came from urban areas. In the age group division, there is no significant difference in the percentage of hospitalized patients living in urban and rural areas. The only exception is patients above 60 among whom over 60% were patients from urban areas. The most, i.e. around 29%, of the fractures happened in summer and the fewest (18.5%) in winter. In spring and autumn the number of hospitalized people was similar.

The causes of craniofacial skeleton fractures were classified as follows (Table 1): assault-related, motor vehicle accident, accident at work, sports-related, fall from height, epizootic injury, others (e.g. accidents at home caused by inappropriate use of machines and tools, slipping on a flat surface and hitting the floor, being hit by the door, fireworks explosion, crashing into obstacle, etc.). On the basis of the χ^2 test, it can be concluded that there is no statistically significant difference between the causes of fractures and the 2002–2006 period (Table 1). Moreover, on the basis of the χ^2 test, it was established that the most common cause of fractures in females and males was assault (33.1% and 61.1%), which is statistically significant. Moreover, this cause may be found among males two times more frequently than among females (Table 2). The second most common cause of fractures is motor vehicle accidents – 24.1% in females and 15.6% in males. This shows that females are more prone to such accidents than

Table 1 – Causes of fractures in years 2002–2006.

The causes of fractures	Year					Total
	2002	2003	2004	2005	2006	
Motor vehicle accident	18 (10.3)	23 (13.7)	49 (20.9)	45 (22.2)	21 (13.9)	156 (16.8)
Assault-related	110 (63.2)	97 (57.7)	130 (55.6)	111 (54.7)	83 (55.0)	531 (57.1)
Accident at work	5 (2.9)	11 (6.5)	18 (7.7)	11 (5.4)	10 (6.6)	55 (5.9)
Sports-related	8 (4.6)	9 (5.4)	12 (5.1)	11 (5.4)	12 (7.9)	52 (5.6)
Fall from height	28 (16.1)	23 (13.7)	17 (7.3)	21 (10.3)	18 (11.9)	107 (11.5)
Epizootic injury	0 (0.0)	2 (1.2)	2 (0.9)	0 (0.0)	2 (1.3)	6 (0.6)
Other	5 (2.9)	3 (1.8)	6 (2.6)	4 (2.0)	5 (3.3)	23 (2.5)
Total	174 (100.0)	168 (100.0)	234 (100.0)	203 (100.0)	151 (100.0)	930 (100.0)

Comments: numbers are given as *n* (%); χ^2 (24) = 33.041; *C* = 0.185; *P* = 0.103.

Table 2 – The dependency between causes of fractures and sex and place of residence.

The causes of fractures	Sex		Place of residence		Total
	Female	Male	Urban areas	Rural areas	
Motor vehicle accident	32 (24.1)	124 (15.6)	98 (14.2)	58 (24.0)	156 (16.8)
Assault-related	44 (33.1)	487 (61.1)	414 (60.2)	117 (48.3)	531 (57.1)
Accident at work	2 (1.5)	53 (6.6)	35 (5.1)	20 (8.3)	55 (5.9)
Sports-related	5 (3.8)	47 (5.9)	44 (6.4)	8 (3.3)	52 (5.6)
Fall from height	36 (27.1)	71 (8.9)	76 (11.0)	31 (12.8)	107 (11.5)
Epizootic injury	2 (1.5)	4 (0.5)	2 (0.3)	4 (1.7)	6 (0.6)
Other	12 (9.0)	11 (1.4)	19 (2.8)	4 (1.7)	23 (2.5)
Total	133 (100.0)	797 (100.0)	688 (100.0)	242 (100.0)	930 (100.0)

Comments: numbers are given as *n* (%). Sex: χ^2 (6) = 87.881; *C* = 0.294; $P < 0.01$; place of residence: χ^2 (6) = 27.110; *C* = 0.168; $P < 0.01$.

Table 3 – The dependency between cause of injury and the patient's age group.

The causes of fractures	Age							Total
	<18	18–25	26–30	31–40	41–50	51–60	>60	
Motor vehicle accident	16 (25.8)	60 (18.6)	19 (17.8)	25 (15.5)	23 (12.8)	10 (15.6)	3 (8.8)	156 (16.8)
Assault-related	28 (45.2)	203 (63.0)	64 (59.8)	91 (56.5)	101 (56.1)	30 (46.9)	14 (41.2)	531 (57.1)
Accident at work	0 (0.0)	10 (3.1)	10 (9.3)	7 (4.3)	16 (8.9)	10 (15.6)	2 (5.9)	55 (5.9)
Sports-related	9 (14.5)	23 (7.1)	6 (5.6)	11 (6.8)	3 (1.7)	0 (0.0)	0 (0.0)	52 (5.6)
Fall from height	5 (8.1)	23 (7.1)	6 (5.6)	22 (13.7)	26 (14.4)	11 (17.2)	14 (41.2)	107 (11.5)
Epizootic injury	1 (1.6)	0 (0.0)	1 (0.9)	1 (0.6)	3 (1.7)	0 (0.0)	0 (0.0)	6 (0.6)
Other	3 (4.8)	3 (0.9)	1 (0.9)	4 (2.5)	8 (4.4)	3 (4.7)	1 (2.9)	23 (2.5)
Total	62 (100.0)	322 (100.0)	107 (100.0)	161 (100.0)	180 (100.0)	64 (100.0)	34 (100.0)	930 (100.0)

Comments: numbers are given as n (%); χ^2 (6) = 113.419; $C = 0.330$; $P < 0.01$.

males. Furthermore, there are more females (27.1%) than males (8.9%) with fractures caused by falling from height. Both people living in urban (60.2%) and rural (48.3%) areas suffered assault-related fractures (Table 2). This dependency is statistically significant and proves that there are assault-related fractures among patients from urban areas in comparison with those from rural areas. People from rural areas (24.0%) are more often involved in motor vehicle accidents than those from cities (14.2%).

Patients from all age groups suffered assault-related fractures (Table 3). The dependence in this category is statistically significant and comparison to other age groups, patients aged 18–25 suffer such fractures the most frequently. The older the person, the more frequent the fracture caused by a fall from height. The percentage of young people aged under 18 in the case of whom the fracture was caused by a fall from height is around 8.1%. This indicator rises with age from 51 to 60 (17.2%). People aged over 60 clearly differ from others. About 41.2% suffered fractures caused by a fall from height. This cause of fracture is independent of the season. The frequency of causes occurring in each season is statistically comparable (Table 4).

The majority of fractures (57.5%) was located in the lower face region and in 5.2% of the incidents, it included both lower and upper face (Fig. 1). The dependency between the craniofacial fracture location and age (Table 5) or sex (Table 6) is statistically insignificant.

Both lower face fractures and upper face fractures were mostly assault-related: 66.0% and 49.3% respectively (Table 7). However, patients with the fractures comprising both lower and upper regions were mostly involved in motor vehicle accidents (48.9%). This dependence is statistically significant. The conclusion is that people who have motor vehicle accidents are the most prone to fractures in the lower and upper face.

5. Discussion

Since 1956, the clinical center in Wrocław has been carrying out an epidemiological and statistic evaluation of maxillofacial skeleton fractures in the periods of 5 and 10 years. As a result of the presented data, it has been concluded that among 937 patients from the Maxillofacial Surgery Department of Wrocław Medical University in years 2002–2006, the vast majority, i.e. 804 cases (85.8%), were males. This considerable predominance of males has also been noted in other long-term studies.[11,12] In English publications and medical literature, the sex coefficient is frequently mentioned. The obtained male to female coefficient at the level of 6.04:1 was almost identical to the one obtained in similar studies conducted in Tanzania[11] and two times higher than the coefficients obtained in other clinical centers.[13–15]

Taking into consideration the age of the patients, most of them were young,[16–23] whereas older people (over 60) constituted single cases (34.6% and 3.6%). Nevertheless, males constitute a vast majority in all analyzed age groups, and their share in the 18–25 group exceeds 92%. Other authors also noticed a greater number of craniofacial fractures among young males.[12] This fact may result from the active lifestyle of young males combined with recklessness and a tendency to take risks.

Table 4 – The dependency between cause of injury and season.

The causes of fractures	Season				Total
	Spring	Summer	Autumn	Winter	
Motor vehicle accident	29 (11.3)	52 (19.2)	46 (19.7)	29 (17.1)	156 (16.8)
Assault-related	156 (60.9)	149 (55.0)	133 (57.1)	93 (54.7)	531 (57.1)
Accident at work	17 (6.6)	14 (5.2)	11 (4.7)	13 (7.6)	55 (5.9)
Sports-related	20 (7.8)	12 (4.4)	11 (4.7)	9 (5.3)	52 (5.6)
Fall from height	29 (11.3)	29 (10.7)	26 (11.2)	23 (13.5)	107 (11.5)
Epizootic injury	1 (0.4)	2 (0.7)	3 (1.3)	0 (0.0)	6 (0.6)
Other	4 (1.6)	13 (4.8)	3 (1.3)	3 (1.8)	23 (2.5)
Total	256 (100.0)	271 (100.0)	233 (100.0)	170 (100.0)	930 (100.0)

Comments: numbers are given as n (%); χ^2 (18) = 25.025; $C = 0.162$; $P = 0.124$.

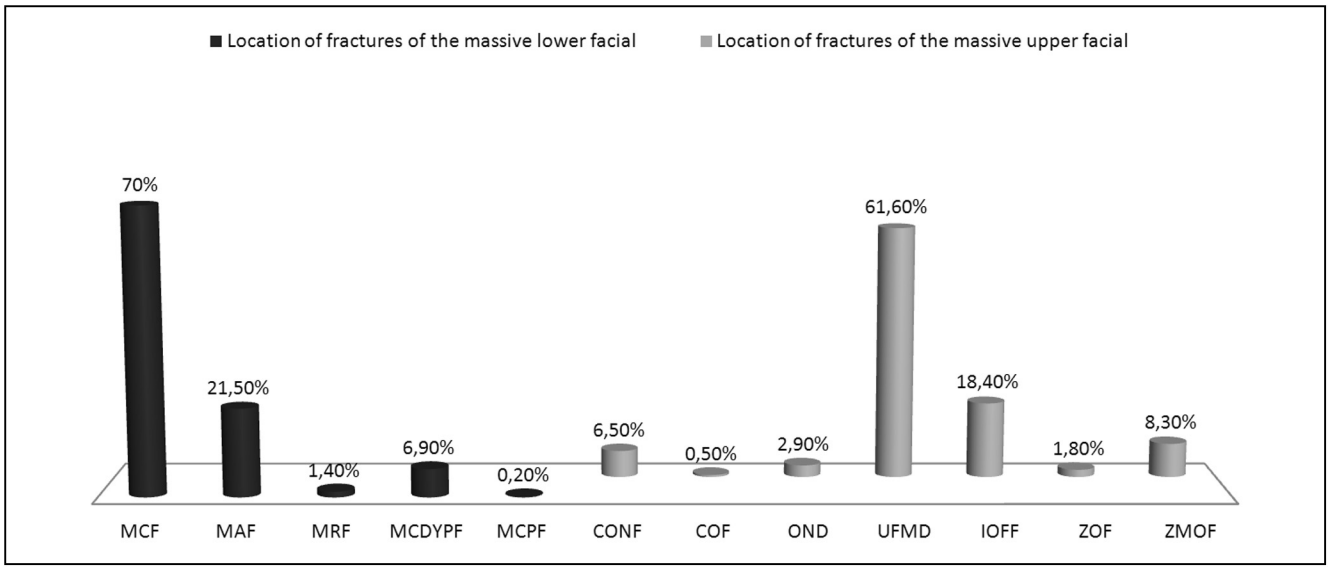

Fig. 1 – Cause of fracture vs. location. ***Comments:*** **MCF – mandibular corpus fractures, MAF – mandibular angle fractures, MRF – mandibular ramus fractures, MCDYPF – mandibular condylar process fractures, MCPF – mandibular coronoid process fractures, CONF – cranio-orbitonasal fractures, COF – cranio-orbital fractures, OND – orbitonasal displacement, UFMD – upper face massive dislocations, IOFF – isolated orbital floorfractures, ZOF – zygomatico-orbital fractures, ZMOF – zygomatico-maxillary-orbital fractures.**

Almost three quarters of the analyzed patients came from cities. This results from administrative and demographic conditions of the region. The frequency of maxillofacial fractures among people living in rural areas is higher in the case of those coming from typically agricultural areas. In retrospective studies conducted from 1988 to 1997, it was reported that 215 incidents of craniofacial skeleton fractures were suffered while working in agricultural holdings.[24]

The greatest number of fractures was reported in summertime (18.9%); however, it was statistically insignificant. Other studies confirm this tendency.[25] This fact may be explained by more intense touristic and sports activity, as well as by a greater number of road accidents occurring in summertime.[15]

The most frequent cause of fractures in the lower and upper face region was assault (57.1%). Similar observations were made by other authors.[11,16,17] The results presented in this

Table 5 – The dependency between craniofacial fracture location and age.

Age	Craniofacial bone fracture location			Total
	Lower face fractures	Upper face fractures	Lower and upper face fractures	
<18	37 (61.7)	21 (35.0)	2 (3.3)	60 (100.0)
18–25	189 (60.4)	112 (35.8)	12 (3.8)	313 (100.0)
26–30	56 (53.3)	44 (41.9)	5 (4.8)	105 (100.0)
31–40	91 (58.3)	56 (35.9)	9 (5.8)	156 (100.0)
41–50	98 (56.3)	63 (36.2)	13 (7.5)	174 (100.0)
51–60	33 (50.0)	29 (43.9)	4 (6.1)	66 (100.0)
>60	16 (51.6)	13 (41.9)	2 (6.5)	31 (100.0)
Total	520 (57.5)	338 (37.3)	47 (5.2)	905 (100.0)

Comments: numbers are given as *n* (%); χ^2 (12) = 7.393; C = 0.090; P = 0.831.

Table 6 – The dependency between craniofacial fracture location and sex.

Sex	Craniofacial bone fracture location			Total
	Lower face fractures	Upper face fractures	Lower and upper face fractures	
Females	67 (53.2)	53 (42.1)	6 (4.8)	126 (100.0)
Males	453 (58.2)	285 (36.6)	41 (5.3)	779 (100.0)
Total	520 (57.5)	338 (37.3)	47 (5.2)	905 (100.0)

Comments: numbers are given as *n* (%); χ^2 (2) = 1.409; C = 0.039; P = 0.494.

Table 7 – The dependency between cause of fracture and location.

The causes of fractures	Craniofacial bone fracture location			Total
	Lower face fractures	Upper face fractures	Lower and upper face fractures	
Motor vehicle accident	68 (13.2)	57 (17.0)	23 (48.9)	148 (16.5)
Assault-related	341 (66.0)	165 (49.3)	12 (25.5)	518 (57.6)
Accident at work	19 (3.7)	30 (9.0)	3 (6.4)	52 (5.8)
Sports-related	21 (4.1)	27 (8.1)	2 (4.3)	50 (5.6)
Fall from height	53 (10.3)	45 (13.4)	6 (12.8)	104 (11.6)
Epizootic injury	3 (0.6)	3 (0.9)	0 (0.0)	6 (0.7)
Other	12 (2.3)	8 (2.4)	1 (2.1)	21 (2.3)
Total	517 (100.0)	335 (100.0)	47 (100.0)	899 (100.0)

Comments: numbers are given as *n* (%); χ^2 (12) = 70.632; C = 0.270; $P < 0.01$.

paper (61.1%) and those obtained in the abovementioned studies prove that the victims were mainly males. This is connected with more aggressive behavior that is characteristic of some young men, as well as abusive alcohol and drug consumption. In countries following other traditions and religions, such as Muslim countries or Japan, craniofacial bones fractures caused by assault are much less frequent.[13] The second most common cause of fractures is motor vehicle accidents (16.8%). This result is confirmed by statistics from other clinical centers located in Poland and Western Europe.[15,16] Research has shown that falls from height are quite a common cause of fractures in the facial region of the crania (11.5%). This very cause was found in almost one-third of the female subjects, and as may be seen in the medical history cards, the most recurrent scenario was falling down the stairs as a result of tripping over or slipping. In other studies, craniofacial fractures caused by a fall from height constitute several percent.[16] Often fractures of the facial region of the crania are work-related. However, over the years, as a result of improving safety and hygiene at a workplace, it has been observed that the number of such accidents has decreased.[18] Even though the percentage of fractures caused by accidents at work constituted only 5.9%, it should be highlighted that employees are still reckless and do not wear hard hats or protective glasses. What is more, they constantly remove preset casings of rotating elements of the machines (discs, chains, rack wheels or pulleys).[24] The last most frequent cause of fractures in this statistical analysis were sport-related accidents (5.6%). The most dangerous sports include disciplines where direct contact between contestants is required, that is the so called contact sports (soccer, basketball, martial arts). A considerable number of injuries may be also found as resulting from cycling and skiing. In team sports, participants usually have elbow-head or head-head contact. In the case of cyclists and skiers, the causes are usually falls or collisions with other contestants. The greatest number of sport-related injuries occurred in the game of soccer or as a result of falling off a mountain bike on a hard surface.[19] In the analyzed material in a separate group of fractures (connected with sports), frequent cases of falling off a mountain bike have been noticed.

The remaining causes of maxillofacial fractures (i.e. being hit by the door, fireworks explosion or iatrogenic injury) and epizootic injuries do not constitute more than 2.5%. In epidemiological studies conducted by other authors, the frequency of facial bones fractures caused by the aforementioned factors did not exceed 11%.[16]

A detailed analysis of the causes of maxillofacial fractures listed above facilitated the identification of characteristic tendencies depending on sex, age group and place of residence. The distribution of causes was not different from the one demonstrated in other authors' papers (assault > motor vehicle accidents > fall from height).[15,16] Among females, the predominant cause was assault (33.1%), and falls from height were more frequent than motor vehicle accidents: 27.1% and 24.1%, respectively. Significant predominance of assault-related fractures and those resulting from motor vehicle accidents in the age group of 18–25 may stem from more intense lifestyle characteristic for this age or recklessness and poorer driving skills.[17]

There were more incidents of assault-related fractures among urban residents in comparison with inhabitants of rural areas (60.2% and 48.3%, respectively). However, there were more motor vehicle accidents (24.0% and 14.2%, respectively) and work-related accidents (8.3% and 5.1%, respectively) in rural areas in comparison to urban areas. A greater frequency of assaults among urban residents results from a significantly higher crime rate and numerous sports events. A higher number of motor vehicle accidents among rural residents may result from worse road infrastructure and exceeding speed limits on local roads. The predominance of work-related maxillofacial fractures among rural residents in comparison to urban residents is connected with the specificity of work in agricultural holdings, which is consistent with what the authors have mentioned earlier.

Based on the analysis of medical documentation of patients with facial fractures of the skull, it was shown that the fractures were usually located in the lower region of the jaw and they constituted 57.5%. Also in other epidemiological studies, maxillofacial fractures were the most common in the region of this bone.[11,13,14,16] Such a considerable number of jaw fractures results from the anatomical location of the jaw as it is protruded and not shielded by other craniofacial bones. The jaw, despite its resistance to bending and stretching, is located in a place that makes it susceptible to accidental side or front injuries which often cause fractures.

Because of intense social and professional activity of men, significant predominance of males among patients with fractures of the lower face region (above 80%) found in literature has been confirmed.[20] In relation to the age of

patients, fractures were most common among young people (aged 18–25) and constituted 20.88%. Assault and motor vehicle accidents were the most frequent causes of fractures. The most common locations of lower jaw fractures were the corpus (70.0%), the angle (21.5%) and the coronoid process (6.9%).

Fractures of the ramus of the mandible and the coronoid process occurred rarely (1.4% and 0.2%). By comparing the obtained results with those found in similar publications, it may be concluded that there is a similarity in the structure of particular fracture locations in the lower face region. The analysis of fractures of the facial region performed in this paper showed that the fractures in the upper face region constituted 37.3%. Analogical studies on the fractures located in the upper face massive indicate the percentage of 14.3–40.0%.[12,21,22]

Also in the case of fractures in the upper face region, the greatest number was found in males who were in their thirties. Almost half of upper face region fractures were caused by assault (49.3%). Motor vehicle accidents and falls from height constituted 17% and 13.4%, respectively. Work and sport-related fractures accounted for 8.1–9.0%. The data from papers on epidemiology of different types of upper face region fractures also indicated assault, road accidents and falls as the main causes.[23] However, some authors mention accidents at work in the third place.[22]

The analyzed material shows that patients with fractures of both face regions (upper and lower) constituted 5.2% of the cases. These fractures were usually caused by motor vehicle accidents (48.9%) and concerned males aged 41–50. It may be assumed that craniofacial fractures of both face regions occur in few percent, which is proved in other statistical analyses.[21] The tendency in the percentage of fractures of both face regions has been confirmed by Iida who conducted research on a group of 1 502 patients hospitalized as a result of craniofacial fractures. 6.7% of the subjects suffered fractures of both face regions.[14]

6. Conclusions

1. The most common causes of maxillofacial fractures among the citizens of Lower Silesia treated in the Maxillofacial Surgery Department of Wrocław Medical University in years 2002–2006 were assault (57.1%) and motor vehicle accidents (16.8%). This means that violence is a very grave social problem.
2. Interestingly, the percentage of work-related fractures has decreased almost by half in comparison to the data found in publications written some time ago.
3. The greatest number of craniofacial fractures was found in young males aged 18–25 living in cities, and the mandible was the most frequently damaged bone of the craniofacial region (57.5%).

Conflict of interest

None declared.

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