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The Impact of the SARS-COV-2 pandemic on the Prevalence of Injuries among Children and Adolescents at the Upper Silesian Child Health Center in Katowice

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ABSTRACT

Background: Maxillofacial injuries quite often relate to children. The etiology of injuries occurring among children and adolescents differs in different age groups. In December 2019, the new SARSCoV-2 coronavirus was identified. Pandemic and the preventive actions had a significant impact on the epidemiology and etiology of injuries in children and adults. The aim of this analysis is assessing the impact of the SARSCoV-2 pandemic and the social restrictions on the frequency and type of maxillofacial injuries among children and adolescents treated at the Children's Trauma Center in Katowice and the Upper-Silesian Child Health Center.

Material and Methods: A retrospective analysis of the medical records of patients with craniofacial fractures is based on six periods of time: February-May 2019 [Spring 2019], February-May 2020 [Spring 2020], JuneSeptember 2019 [Summer 2019], June-September 2020 [Summer 2020], October-January 2019 [Autumn 2019], October-January 2020 [Autumn 2020].

Results: Craniofacial injuries were the most common in the age group of 10-18 years (65.2%) in March-May 2019 while in March-May 2020 injuries were as well common in the both age group. Violence, sports and traffic accidents were the cause of injuries in 27.3% each in June-September 2019, but playing sport was the main cause of injury in June-September 2020 (42.9%). Differences in the overall number of patients with craniofacial trauma were observed in every period of time.

Conclusion: There were differences in the number of patients reporting to the Upper Silesian Child Health Center. In the peak periods of COVID-19 in the spring and autumn, the number and variety of cases of injuries were significantly different from the previous norms.

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Introduction

Maxillofacial injuries quite often relate to children. Injuries involve as well soft and hard tissue trauma, including facial bones and teeth [1]. The etiology of injuries occurring among children and adolescents differs in different age groups. In early childhood, injuries most often occur as a result of a fall and it is related to development of psychomotor skills [2]. In adolescence, traffic accidents, sports, and violence are the main causes of injuries [3]. In December 2019, the new SARSCoV-2 coronavirus was identified, which causes the COVID-19 disease, which is in many cases responsible for acute respiratory distress syndrome [4]. The new variant of the coronavirus spread very quickly and consequently; the governments of many countries are forced to introduce many restrictions in the field of social life. This state was especially noticeable in the initial period of the pandemic. The preventive actions include: maintaining social distancing, closing schools and limiting sports activities or traveling. These actions had a significant impact on the epidemiology and etiology of injuries in children and adults [5].

The aim of this analysis is assessing the impact of the SARS-CoV-2 pandemic and the social restrictions on the frequency and type of maxillofacial injuries among children and adolescents treated at the Children's Trauma Center in Katowice and the Upper-Silesian Child Health Center.

Materials and Methods

The study is based on a retrospective analysis of the medical records of patients treated at the Children's Trauma Center in Katowice and the Upper-Silesian Child Health Center due to craniofacial fractures in six periods of time: February-May 2019 [Spring 2019], February-May 2020 [Spring 2020], June-September 2019 [Summer 2019], June-September 2020 [Summer 2020], October-January 2019 [Autumn 2019], October-January 2020 [Autumn 2020]. Clinical and radiographic examination: craniofacial CT without contrast or panoramic radiography was

used to make a diagnosis. We took into account such data as: gender, age, treatment method, anatomic location of the injury, and the cause of the injury. Patients were divided into 2 age groups: 0-9 years and 10-18 years. The data is included in Table I.

Table I: Number of Patients, Age, Sex, Treatment, Location and Cause of the Injury

	2019 spring	2020 spring	2019 summer	2020 summer	2019 autumn	2020 autumn
Total maxillofacial trauma patients	23	10	11	21	15	12
Gender						
Male	14 (60.9%)	7 (70%)	9 (81.8%)	17 (81%)	11 (73.3%)	8 (66.7%)
Female	9 (39.1%)	3 (30%)	2 (18.2%)	4 (19%)	4 (26.7%)	4 (33.3%)
Treatment						
Inpatient	17 (73.9%)	8 (80%)	4 (36.4%)	14 (66.7%)	9 (60%)	6 (50%)
Outpatient	6 (26.1%)	2 (20%)	7 (63.6%)	7 (33.3%)	6 (40%)	6 (50%)
Age						
0-9	8 (34.8%)	5 (50%)	4 (36.4%)	8 (38.1%)	3 (20%)	6 (50%)
10-18	15 (65.2%)	5 (50%)	7 (63.6%)	13 (61.9%)	12 (80%)	6 (50%)
Anatomic location						
Mandible	6 (26.1%)	2 (20%)	4 (36.4%)	4 (19%)	7 (46.7%)	5 (41.7%)
Middle face						
(Maxilla, orbit, nose, zygoma)	11 (47.8%)	6 (60%)	7 (63.6%)	14 (66.7%)	7 (46.7%)	5 (41.7%)
Temporofrontal area	4 (17.4%)	1 (10%)	0 (0%)	2 (9.5%)	1 (6.6%)	0 (0%)
Only Dental	2 (8.7%)	1 (10%)	0 (0%)	1 (4.8)	0 (0%)	2 (16.6%)
Etiology						
Sport	8 (34.8%)	3 (30%)	3 (27.3%)	9 (42.9%)	5 (33.3%)	2 (16.6%)
Traffic accident	2 (8.7%)	1 (10%)	3 (27.3%)	4 (19%)	0 (0%)	0 (0%)
Violence	1 (4.3%)	3 (30%)	3 (27.3%)	2 (9.5%)	5 (33.3%)	1 (8.3%)
Falls	12 (52.2%)	3 (30%)	2 (18.1%)	6 (28.6%)	5 (33.3%)	8 (66.7%)
Suicide attempt	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (8.3%)

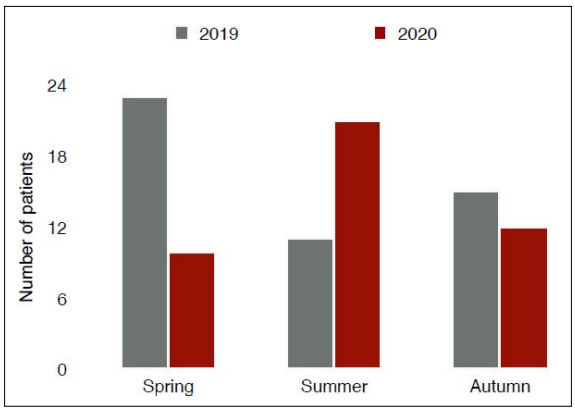

Figure 1: Analysis of the number of reported patients due to craniofacial injuries to the Upper Silesian Children's Health Center and the Children's Trauma Center in the selected period 2019-2020

Discussion

In 2019 we admitted 49 patients in total and in 2020 43 patients, which is a decrease of 12.2%. The largest decrease in the number of patients who came to our Center was recorded in the spring of 2020 and amounted to 43%, which was caused by the limitation of planned surgical procedures and the reluctance of patients to report to the hospital during the first wave of COVID-19 [6, 7].

At the beginning of the pandemic, when the panic in society and the number of cases increased as well as when social restrictions were introduced, there was a decrease in the number of patients reporting to the hospital with craniofacial injuries. In the study of Boutray et al., who also compared the total number of patients reporting craniofacial injuries in 2019 and 2020, a decrease of 62% was noted, while Press reports a 35.6% decrease in the number of patients in the initial period of the pandemic [8, 9]. While the pandemic situation was stabilizing during the holiday season and restrictions on the use of public space were gradually lifted, there was a noticeable increase in the number of trauma patients by more than 90% compared to the same period in 2019. The situation may be the result of a so-called "rebound" after a few months of limitation in social activity. Most publications base their analysis on the comparison of the periods March-May 2019 and 2020 and do not describe the results for the summer and autumn periods [8, 10].

Press reported a decrease of 65% in injuries, which were a result of violence whereas in our Trauma Center there was a decrease of 33% at this time [9]. The most common cause of injury in both 2019 and 2020 was an accidental fall, followed by a sports injury, which is similar to the analysis by Ilyas et al. [10].

There was a 12.5% decrease in injuries while practicing sports and the group of patients with fall injuries decreased by 10.5%. It can be suspected that the reason for such a change was the

generally reduced activity of the society in closed spaces such as sports halls, swimming pools and outdoors as well as limiting the possibility of interpersonal contact. Sports facilities and parks were closed and their use was forbidden. In 2019 in the group of sports injuries we observe a decrease of 62.5% in the number of cases if we compare the spring to summer periods, while in 2020, that is the year of the pandemic, there was an increase of 200%.

The study also reported a suicide attempt that did not appear in the previously analyzed period. Although this difference is not statistically significant, it highlights the negative impact of the pandemic and social isolation on mental health. This problem should not and is not ignored in many countries [11].

In the 10-18 age group, there was a 66% decrease in the number of injuries in the period February-May 2020 compared to the same period in 2019 and a 50% decrease in the autumn of 2020 compared to the same period the previous year. In the study by Dagi et al., the greatest decreases were recorded in children aged 11-17 - junior high school / high school and 6-10 years old - primary school [7]. This tendency in Poland is due to the necessity of remote learning during the pandemic in this age group and during these seasons of the year.

Most of the injuries that occur in children involve the middle part of the face, including the nasal bones. Injuries in this anatomical region were the most common in the spring and summer of 2019 and 2020. However, we observed a decreased number of diagnosed fractures in this region, which is related to the overall reduced number of patients reporting for the diagnosis and treatment of craniofacial fractures. Middle facial fractures are often the result of low kinetic injuries, such as accidental falls. The decrease in the number of nasal and middle face fractures may be related to the lack of diagnosis. This situation may be related to the fear of accidental infection with the SARS-Cov-2 virus during their stay in the hospital and some patients avoided visiting the hospital with such injuries, assessing the injuries as minor and not so serious [11,12].

Conclusion

The purpose of the above analysis was to assess the impact of COVID-19 on the epidemiology and etiology of craniofacial injuries in children. There were differences in the number of patients reporting to the Upper Silesian Child Health Center and the Trauma Center for Children in Katowice due to craniofacial injuries during different periods of the pandemic. The number and variety of cases of injuries in the peak periods of COVID-19 in the spring and autumn, were significantly different from the previous norms, while with the lifting of restrictions and the decrease in the number of COVID-19 cases in the summertime, the data was similar to the pre-pandemic period. It was necessary to develop healthcare algorithms to ensure its continuity, such as increased use of personal protective equipment, hand hygiene, PCR tests in the diagnosis of COVID-19 in spittle samples of patients admitted to the Maxillofacial Surgery Department, and the dissemination of vaccinations against SARS-COV -2.

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Conflict of Interest Statement: None of the authors have a conflict of interest.

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