

PATTERN OF ASSAULT RELATED MAXILLOFACIAL INJURIES AT A TERTIARY CARE HOSPITAL DURING COVID-19 PANDEMIC

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ABSTRACT

Objective: To determine the pattern of assault related maxillofacial injuries at a tertiary care hospital during COVID-19 pandemic.

Study Design: Cross sectional study.

Place and Duration of Study: Department of Dentistry, Jinnah Postgraduate Medical Centre, from Mar 2020 to May 2020.

Methodology: The study was conducted for a period of two months. Patients reported with assault-related maxillofacial injuries due to interpersonal violence during lockdown period, seeking legal advice for dental/maxillofacial treatment were selected for the study. A well-structured Performa comprising of two sections; the first section addressing the demographic information and second about the information related to maxillofacial injury. The data obtained was analyzed using the SPSS version 25.

Results: Out of the total 41 patients, 11 (26.8%) belonged to a common age bracket of 20-24 years. In 32 (78%) cases, the attacker was known to the victim. Furthermore, direct blow with fist was the most common mechanism of the maxillofacial injury in 32 (78%) patients. Majority, 26 (63.4%) of the victims suffered injuries on the left side of the face. While 34 (82.9%) patients had injuries on the lower third of the face.

Moreover on the basis of severity, 18 (43.9%) patients fall under grade 3 of trauma severity score. 32 (78%) patients were treated conservatively, whereas 9 (22%) underwent surgical interventions.

Conclusion: Assault related maxillofacial injuries are most common amongst young adult males during COVID-19 lockdown; this can be attributed to increase in violence in our society.

Keywords: Assault, COVID-19, Maxillofacial Injuries.

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INTRODUCTION

In December 2019, the novel corona virus disease 19 (COVID-19) emerged in Wuhan, China with SARS-CoV-2 as its etiologic agent^{1,2}. The contagion spread across the globe and was declared as sixth public health of emergency Services (SPHEC) on January 30, 2020 by the WHO³. In line with the World Health Organization (WHO) declaration of a Global Pandemic and the evidence of rapid community spread of COVID-19 infection in the population, the Government of Sindh in collaboration with Government of Pakistan instituted strict lockdown measure on 26th March 2020 across the

province⁴. These lockdown measures included social distancing, working from home, closure of schools, closure of shopping malls and restaurants restricting to availability of need only basis like grocery stores and pharmacies⁵. Lockdown has completely transformed the lifestyle of everyone globally. It has had a profound impact on physical, social, emotional, psychological and financial aspects of society as a whole^{6,7}. Particularly mental health of the common people has deteriorated due to financial and economic burden, job insecurity, isolation and paranoia, low morale and feeling of impending doom⁸. This change has caused a major shift in the patterns of crime all around the world. Considered by some criminologists to be a natural experiment, the lockdown has suppressed organized crime and these changes will continue as the pandemic continues to prevail⁹.

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The face being the most prominent part of the body is particularly vulnerable to injuries as a consequence of assault. Assault may be defined as the act of inflicting physical harm or unwanted physical contact upon an individual¹⁰. In Pakistan figures and patterns of assault injuries, street crime and domestic violence during the COVID-19 outbreak remain equivocal. Our article aims to present the incidence and presentation of patients reporting to JPMC maxillofacial surgery department on account of assault injury during Lock-down. The results will be used to make suggestions for future research into the relationships between the coronavirus pandemic and assault injury.

METHODOLOGY

A descriptive cross sectional study was conducted at the department of Dentistry, Jinnah Postgraduate Medical Centre for a period of two months (15th March 2020 till 15th May'2020); Prior ethical approval was taken from Ethical and Review Committee, JPMC: No. F.2-81/2020-GENL/42197/JPMC through an expedited process.

The sample size calculated was 31 patients using the WHO sample size calculator, keeping confidence level 95%, absolute precision required 0.05 and anticipated population proportion 0.0215. Though all the (41) patients who reported with maxillofacial injury due to interpersonal violence during Lockdown period, for seeking legal advice for dental/maxillofacial treatment and were conscious enough to give history regarding the incident were selected for the study; Critically ill patients and patients not willing to be the part of study were excluded. In this study non probability sampling technique was used. After an informed consent, patients were investigated for the pattern of assault related maxillofacial injury. Data was collected by administering a well - structured Performa comprising of two sections. The first section addressed the demographic information including age, gender and the relationship with the attacker. The second section comprised of information related to the

mechanism and site of injury, side of impact, diagnosis, grading and management plan.

Assault injuries are mostly low velocity injuries and the available indexes were not particularly helpful for us during the data collection, a new grading system was devised to characterize the severity of the injuries for our study as given in table-I. This grading system has been evaluated and validated (content and construst validity) by two maxillofacial surgeons. The data obtained were analyzed using the Statistical Package for Social Sciences (SPSS) for windows (version 25, IBM Corporation Chicago, IL, USA). Descriptive statistics were carried out for frequency and percentage calculation of variables.

RESULTS

A total 41 patients with majority 11 (26.8%) of the patients belonging to 20-24 age group were reported to the maxillofacial department. Out of the total, 34 (82.9%) were males and 7 (17.1%) were females. In majority of the cases, 29 (70.7%), the attacker was known to the victim; followed by 7 (17.1%) in which attacker was related (spouse/siblings/parents) and 5 (12.2%) where attacker was unknown to the victim as depicted in table-II. As far as location of incidents are concerned, majority of the cases 15 (36.6%), assaults took place at workplace due to altercation followed by 14 (34.1%), which took place at home due to other reasons such as disputes with known relatives, neighbours or friends, while 7 (17.1%) and 5 (12.2%) were reported as domestic violence and street crimes respectively. Furthermore, direct blow with the fist was the most common mechanism of the maxillofacial injury in 32 (78.1%) patients. Injury caused by blunt weapon (rod) accounted for 8 (19.5%) of the cases followed by 1 (2.4%) case of gunstock. Majority, 26 (63.4%) of the victims suffered from injuries on the left side of the face, while 15 (36.6%) on right side of the face. As far as site of the maxillofacial injury is concerned, 34 (82.9%) had injuries on the lower third of the face followed by 5 (12.2%) in the middle and 2 (4.9%) upper third of the face respectively as depicted in table-III.

Moreover on the basis of severity, 18 (43.9%) patients fall under grade 3 of trauma severity score followed by 11 (26.8%) in grade 1, 8 (19.5%) in grade 4 and 2 (4.9%) in grade 2 and 5

were managed chairside under local anesthesia, in 11 (26.8%) patients supportive management was carried out, while in 2 (4.9%) patients primary closure along with supportive treatment

Table-I: Trauma severity grading system.

Grade	Type of maxillofacial injury	Management
1	Superficial Soft tissue trauma (abrasions, contusions and superficial laceration)	Supportive management
2	Extensive soft tissue trauma (Deep lacerations and avulsion injuries with or without hemostatic complications)	Primary closure along with supportive management
3	Dental/ Dentoalveolar injuries with or without grade 1 and 2 injury	Chairside management under local anesthesia (Splinting/Extractions/suturing)
4	Hard tissue trauma involving fractures of the maxillofacial region with or without grade 1, 2 and 3 injuries	Close Reduction (MMF) Open Reduction and Internal Fixation (ORIF)
5	Maxillofacial injury with concomitant systemic injury requiring active intervention and follow-up by another specialty (plastic surgeon for reconstruction, orthopedic surgeon, general surgeon or neurosurgeon)	Multidisciplinary Team Approach

respectively.

On the basis of history, clinical examination and investigations, it was observed that majority 18 (43.9%) suffered from dental or dento alveolar injuries followed by 13 (31.7%) suffering from

Table-II: Demographic details of participants (n=41).

Age (years)	Frequency; n (%)
20-24	11 (26.8)
25-29	9 (22)
30-34	4 (9.8)
35-39	4 (9.8)
40-44	5 (12.2)
45-49	3 (7.3)
50-54	2 (4.9)
55-59	3 (7.3)
Gender	
Males	34 (82.9)
Females	7 (17.1)
Relationship with the Attacker	
Known	29 (70.7)
Unknown	5 (12.2)
Related	7 (17.1)

soft tissue injuries and 10 (24.4%) suffered from facial fractures as depicted in table-IV. Out of the total, 31 (75.6%) patients were treated conservatively in which majority of the patient 18 (43.9%),

was required. 10 (24.4%) patients underwent surgical intervention; among which 4 patients (9.8%) were managed by mandibulomaxillary fixation (MMF), 2 patients (4.9%) by open reduction and internal fixation (ORIF) and 3

Table-III: Distribution of assault related maxillofacial injury (n=41).

	Frequency; n(%)
Upper Face	2 (4.9)
Middle Face	5 (12.2)
Lower Face	34 (82.9)

Table-IV: Type of Assault related maxillofacial injury (n=41).

	Frequency; n(%)
Soft tissue injury	13 (31.7)
Dental Injury	18 (43.9)
Facial Fractures	10 (24.4)

(7.3%) required both MMF and ORIF as depicted in table-V.

DISCUSSION

COVID-19 and strict lockdown to halt the spread of this infectious disease has completely altered the lifestyle of everyone globally. It has had a profound impact on physical, social, emotional, psychological and financial aspects of society as a whole^{8,11-14}. The primary aim of this

study was to explore the pattern of maxillofacial assault injuries occurring during the COVID-19 lockdown.

In this study, the peak age of incidence for assault was 20-24 years which was corroborated with a prospective study by Olojede *et al* carried out in Nigerian population; which reported that assault is more common among individuals with 20 to 29 years age bracket¹⁰. A local study by MS Durrani also reported similar results, with 21-30 years being the mean age group for assault

to the attacker, and 7% attackers were related such as spouse/siblings/parents and only 5% of the attackers were strangers to the victim. The results are in contrast with a study conducted by Gal *et al* in Romanian population which concluded that young adults are mostly attacked by strangers (43.2%), followed by friends and acquaintance (31.7%), spouse (8.4%) and others¹⁷. Since during COVID-19 lockdown mental health of the common man has suffered so much due to the financial and economic burden, job insecurity,

Table-V: Management of Assault related maxillofacial injury (n=41).

	Type of Managements	Frequency, n (%)
Conservative	Supportive management only	11 (26.8%)
	Primary Closure + Supportive management	2 (4.9%)
	Chairside procedures under local anesthesia (splinting, extractions, suturing)	18 (43.9%)
Surgical	Maxillomandibular Fixation (MMF)	4 (9.8%)
	Open reduction and internal Fixation (ORIF)	2 (4.9%)
	Maxillomandibular Fixation (MMF) + Open reduction and internal Fixation (ORIF)	3 (7.3%)
	Multidisciplinary approach	1 (2.4%)

related injury¹⁴. This is primarily because this age group is more active, social, exhibits aggression and more prone to engage in fights and brawls.

Males are more affected in assault related injury than females as per our study; with male to female ratio of 4.8: 1. Male preponderance is also observed in the most available literature with male: female ratio being 2.3:1 as reported by Durrani *et al*¹⁴ though Eggenesperger *et al* in a 3 year survey in central Switzerland reports it to be 6.2:1¹⁵. It may be due to the reason that males are primary bread earners in muslim countries like Pakistan thus are more socially active and under stress for financial reasons. Lockdown and escalated financial constrain during COVID-19 pandemic has heightened anxiety and fueled anger among males¹⁶.

We have noticed that no figures are available that define the victim and offender relationship in assault related maxillofacial injuries during COVID 19 lockdown. In our study our special area of interest was to note the victim offender relationship. 70.7% of the offenders were known

low morale, isolation, escalating unemployment, paranoia and feeling of impending doom that household disputes and workplace tension has escalated. Periodic episodes of negative spirals of emotions and solitary confinement have fueled assault attributed to known attacker and victim primarily because known victims are more vulnerable during the lockdown period.

As far as location of incidents are concerned, majority of the cases 15 (36.6%), assaults took place at workplace on account of altercation between agitated and financially frustrated workers. 14 (34.1%) of assaults, which took place at home due to reasons such as disputes with known relatives, neighbours or friends, while 7 (17.1%) and 5 (12.2%) were reported as domestic violence and street crimes, respectively. These results differ than the study conducted in non COVID times by Gal *et al* in Romanian population where assault on streets/highways by strangers were the most common subject (35.9%) followed by the home (30.3%), while workplace was the least common location for assault related injury¹⁷. As the impact of COVID-19 on the global economy and the

theory of survival of fittest, the frustration level has increased among the daily wagers and laborers resulting in increased assault related injury at workplace among coworkers or by someone known.

It is observed that majority 32 (78.1%) of the victims were attacked with a direct blow on the face followed by rod and gunstock. Facial blow/fist is the common most mechanism of trauma in assault related maxillofacial injury in other studies (87.9%) followed by other means such as knives, gunstock, rods and human bites^{10,18}. Attackers use fist as a spontaneous reaction and it is thought that the resulting trauma will deliver pain and internal injury maintaining the continuity of the skin.

Left-sided injury was more common than the right-side; 63.4% of the victim had right sided injury while 36.6% had on right side of the face. This corresponds to other studies where face was divided into left, right and central; and left sided injuries were noticed in 45% of those cases^{15,19}. This probably reflects the fact that 90-95% of the population in the world is right handed, and right hand is used More in more all routine activities including fights. The hemispheric cerebral dominance also leads the victim to turn to the right in a reflex manner to avoid a blow, further presenting the left side of the face to an attacker²⁰.

Face being the most prominent part, is more predisposed to assault related trauma. Using Anthropometric Proportions, face was divided into upper, middle and lower third; and it was found that most patients in our study had (82.9%) had injuries on the lower third of the face followed by the middle (12.2%) and upper third (4.9%) of the face respectively. This contradicts with the other studies where middle third of the face along with zygoma was the common anatomic site¹⁹. This difference could be due to different facial proportions used in those studies.

Facial injury was classified into soft tissue injury, hard tissue injury and dental injury and was graded according to the severity score; it was

observed that majority of the victims i.e. 18 (43.9%) suffered from dental or dento alveolar injuries followed by soft tissue injuries 13 (31.7%) and facial fractures 10 (24.2%). When facial injury was graded on the basis of severity, 18 (43.9%) patients fell under grade 3 of trauma severity score which is dental/dento alveolar injuries, followed by grade 1 in 11 (26.8%) patients, grade 4 in 8 (19.5%) and 2 (4.9%) patients in grade 2 and 5 injury respectively. This contradicts with some studies where soft tissue injury was more frequent among assault victims followed by the dental/dento alveolar trauma; whereas facial fracture were reported to be least common among all the studies^{10,18,19}. This variation in our study could be due to concomitant dental/ dentoalveolar injuries with soft tissue injury, periodontally compromised teeth, object used during the interpersonal violence, force applied, age of the patients at the time of incident and the group of the people reporting to the hospital for treatment and legal action.

Management options for facial fractures include conservative management (medical treatment, dental management and supportive treatment) and surgical management (closed reduction with maxillomandibular fixation MMF and open reduction & internal fixation/ORIF or combination of ORIF and MMF)²¹. Around 31 (75.6%) of the patients in this study were managed conservatively; out of which 18 (43.9%) patients required chairside procedure under local anesthesia such as splinting of dental segment, extraction of teeth and suturing of wounds, 11 (26.8%) patients received supportive treatment only and 2 (4.9%) patients required primary closure of the wounds along with supportive treatment. The conservative approach was preferred because of the type of injury (dental/dentoalveolar injuries) and also aggressive treatment was delayed due to COVID-19 breakdown. Surgery was performed in the 10 (24.3%) patients with facial fractures, out of which 4 (9.8%) of the patients were managed with close reduction (MMF), 3 (7.3%) with ORIF and MMF, 2 (4.9%) patients underwent ORIF only and 1 (2.4%)

patient required Multidisciplinary treatment. In our institute these protocols to delay elective procedure were as per recommendation by CDC (Centers for Disease Control) and the AOCMF, as they emphasized on postponing / rescheduling all the elective procedures till clear management policies are identified^{22,23}.

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CONCLUSION

Assault related maxillofacial injuries are frequent and most common amongst young adult males in the second decade of life, in Karachi during COVID-19 lockdown; this reflects the frustration among the young adults majorly due to the financial setback. World over the pattern of crime has changed owing to the lockdown. Rate of organized crime has decreased and the rate of domestic violence and unorganized crimes, such as disputes among known relative and acquaintance and crime of passion has increased. Unplanned assaults do not involve firearms and battery usually results in facial trauma. There are currently no available statistics on the new emerging pattern of maxillofacial injuries. Our study has basically presented the changing trend of pattern of assault related maxillofacial injuries in a Pakistani society amidst the corona outbreak. The fact concludes that most assaults involved a known related attacker is a reflection of the psychological stress and the emotional burden that the economic setback of corona outbreak has brought with itself. Mental health issues emerging during the prevailing situation should be addressed. Further elaborate prospective surveys may help to explore effect of the adversity that the outbreak has brought with it. Future suggestions to minimize the adversity and address the deteriorating mental health of the masses will help decrease the stress and consequently the burden of trauma victims presenting

to health care centres a result of interpersonal violence that could have been easily avoided.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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