

The etiological evaluation of the nasal bone fracture in the patients admitted in Imam Hospital of Urmia, Northwestern Iran

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Abstract: Introduction: Nasal bone fracture is one of the most common fracture in the maxilla-facial region of the head. Almost the facial traumas in the adults occur in car accidents due to the trauma to the face. The familial struggles or fracas also account for other types of these injuries, which occur more commonly in the urban regions and big cities. The diagnosis of nasal bone fracture is usually complicated by ecchymosis and swelling of the traumatic site. Since the nasal bone fractures are the most common facial fractures, and due to the esthetic importance for the patients, it cause a great deal of costs and social and psychological complications. Regarding the local and cultural factors in these conditions, we designed this study to elucidate more clearly the exact influencing factors and causes in nasal bone fracture in northwestern Iran. **Methodology:** All patients with nasal bone fractures to the main state hospital (Urmia Imam Khomeini), were included in the study during 2000-2007. All necessary information were recorded, including the gender, age, etiology of nasal bone fracture, occupation, urban or rural residency, and the type of nasal bone fracture, including lateral or frontal. The data were tabulated and analyzed by SPSS version 17. The p-value more than 0.05 was considered as significant. **Results:** Of total 350 patients, 38 patients were in age group 1 month to 10 years old, 142 cases in 11-20, 96 cases in 21-30, 41 cases in 31-40, 18 cases in 41-50 and 15 cases had more than 50 years old. In the age group of less than 1 month, there were no nasal bone fractures. The patients were according to the occupation as 27 soldiers (7.7%), 117 school pupils (33.4%), 41 farmers (11.7%), 28 workers (8%), 57 housekeeping wives (16.3%), 25 students (7.1%), 55 businessmen (15.7%). The fractures were 280 cases of lateral (80%) and 70 cases (20%) of frontal type. There were no significant difference in urban (n=212) and rural (n=138) nasal bone fracture (p> 0.05). In urban pattern 171 cases (80.6%) lateral and 41 (19.3%) frontal and in rural regions 109 cases (78.9%) and lateral cases 29 (21.01%). **Conclusion:** According to the findings of our study, the followings are suggested: instructing the people to enhance the cultural level to improve the interpersonal and individual interactions through mass media; enhancing the safety of pedestrian ways and crowded public places; instructing people to observing the traffic rules to decrease the accident dangers; obligation of using the safety cap for motor-cyclists; and observing the safety codes high risk sport fields. [Hassan Latifi, Peyman Mikaili, Reza Samarei, Dawood Nasr-Arkan, Kaveh Latifi. **The etiological evaluation of the nasal bone fracture in the patients admitted in Imam Hospital of Urmia, Northwestern Iran.** Journal of American Science 2011;7(9):92-96]. (ISSN: 1545-1003). <http://www.americanscience.org>.

Keywords: Nasal bone fracture, facial fractures, incidence, occurrence, Northwestern Iran

1. Introduction

Nasal bone fracture is the most common fracture in the maxilla-facial region of the head. Green stick fractures may occur in any ages before completion of the bone calcification, but more commonly, it occurs in younger ages especially in neonates. In the adult cases, the nasal bone fracture occurs in two types: cross right and frontal blow. The former is caused by the trauma to one side of the nose, which causes to divert both nasal bones to the same side. In the latter, the trauma is rostrally and the nasal bones are stuck deeply into the face.

Almost the facial traumas in the adults occur in car accidents due to the trauma to the face. In these cases, the injuries to the soft tissue are more

extensive than bone tissue. The familial struggles or fracas also account for other types of these injuries, which occur more commonly in the urban regions and big cities (Fomon, 1939).

The diagnosis of nasal bone fracture is usually complicated by ecchymosis and swelling of the traumatic site. Nevertheless, palpating the region may reveal the crepitation or deformations. Although the nasal and facial radiographies are provided, they do not add any additional and helping information to make a definite diagnosis. But it may be useful to differentiate the latter type of fractures from other nasal deformities, caused secondary to the traumas and also useful for diagnosing concomitant lesions, i.e. sinus and orbital brim fractures (Hampson, 1995).

Since the nasal bone fractures are the most common facial fractures, and due to the esthetic importance for the patients, it cause a great deal of costs and social and psychological complications. As mentioned above, although the motor vehicle accidents are main causative factor, other important factors are involved. Having a good knowledge about the predisposing and causative factors will guide the local public health authorities to do necessary measurements to prevent or minimize the occurrence and the complication of the disease in any certain society (Renner, 1991). Regarding the local and cultural factors in these conditions, we designed this study to elucidate more clearly the exact influencing factors and causes in nasal bone fracture in northwestern Iran. The results of this study may be useful for the researchers and public health policy makers in the community like the Middle East and Caucasian region, because of some cultural similarities.

2. Material and Methods

All patients with nasal bone fractures to the main state hospital (Urmia Imam Khomeini), were included in the study during 2000-2007. All necessary information were recorded, including the gender, age, etiology of nasal bone fracture, occupation, urban or rural residency, and the type of nasal bone fracture, including lateral or frontal. The data were tabulated and analyzed by SPSS version 17. The p-value more than 0.05 was considered as significant.

3. Results

Of total 350 patients, 262 cases (74.8%) were men and 88 cases (25.2%) were women (Table 1). Of all cases, 38 patients were in age group 1 month to 10 years old, 142 cases in 11-20, 96 cases in 21-30, 41 cases in 31-40, 18 cases in 41-50 and 15 cases had more than 50 years old. In the age group of less than 1 month, there were no nasal bone fractures (Figure 1). The causative factor of 350 nasal bone fracture, 117 cases (33.4%) were due to struggles and fracas, 119 cases (34%) due to falling, 43 cases (12.3%) because sport accidents, 51 cases (14.6%) due to car accident, and 20 cases (5.7%) motor-bike accident (Table 2).

Table 1: The frequency and percentage of the patients with nasal bone fracture regarding the sex.

Sex	Frequency	Percentage
male	262	74.8%
Female	88	25.1%
Total	350	100%

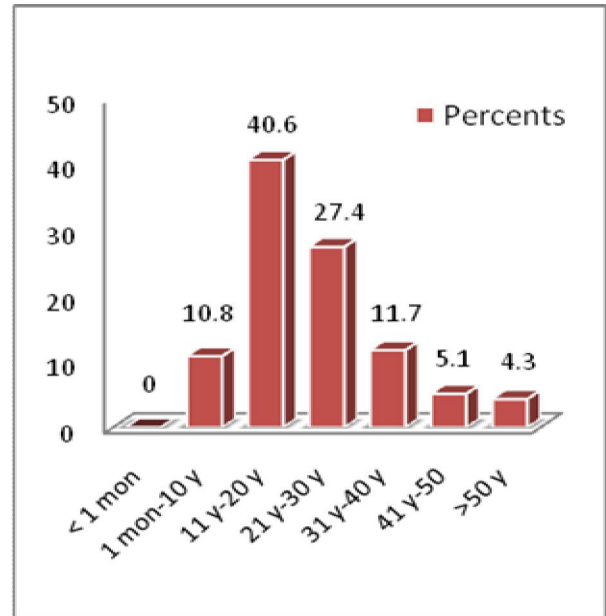


Figure 1: The frequency and percentage of the patients with nasal bone fracture regarding different age groups.

Table 2: The frequency and percentage of the patients with nasal bone fracture regarding the etiological factors.

Etiological factor	Frequency	Percentages
struggles and fracas	117	33.4%
falling	119	34%
sport accidents	43	12.3%
car accident	51	14.6%
motor-bike accident	20	5.7%
Total	350	100%

The patients were grouped according to the occupation as 27 soldiers (7.7%), 117 school pupils (33.4%), 41 farmers (11.7%), 28 workers (8%), 57 housekeeping wives (16.3%), 25 students (7.1%), 55 businessmen (15.7%).

The residency situation of the patients was as follows: 212 (60.5%) of urban and 138 (39.4%) of rural regions (Table 3).

The fractures were 280 cases of lateral (80%) and 70 cases (20%) of frontal type (see Figure 3 and Figure 4). The green stick fracture was not reported. The frequency distribution of different nasal bone fracture types have been tabulated in Figure 2. The profile of different types of nasal bone fracture forms according to patients occupation have been summarized in Table 4. The profile of different types of nasal bone fracture forms according to the etiological causes has been summarized in Figure 5.

Table 3: The frequency and percentage of the patients with nasal bone fracture regarding the residency location.

Residency Location	Frequency	Percentages
Urban	212	60.5%
Rural	138	39.4%
Total	350	100%

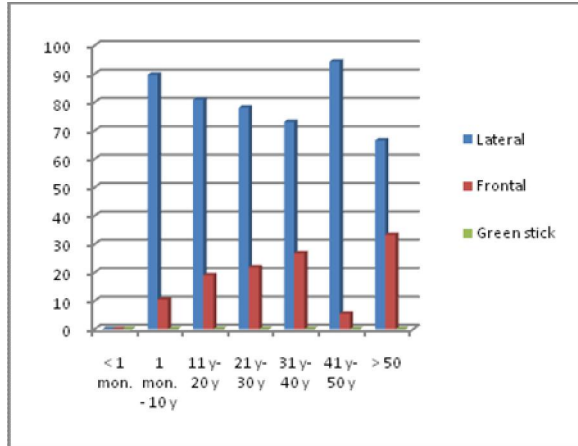


Figure 2: The frequency and percentage of the different types of nasal bone fracture, including lateral, frontal and green-stick, according to different age groups.

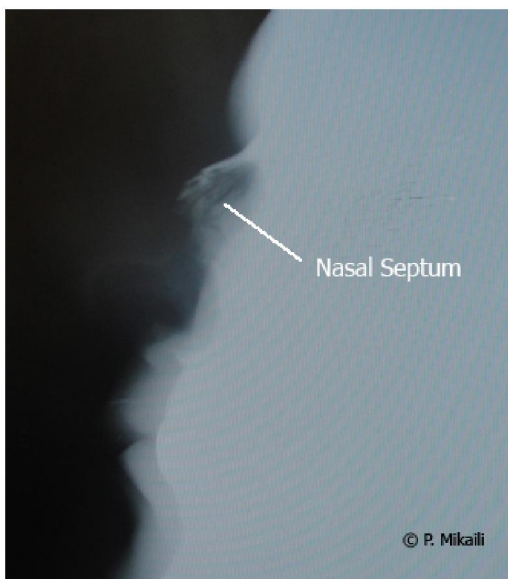


Figure 3: Lateral radiography of one of our patients with nasal bone fracture.

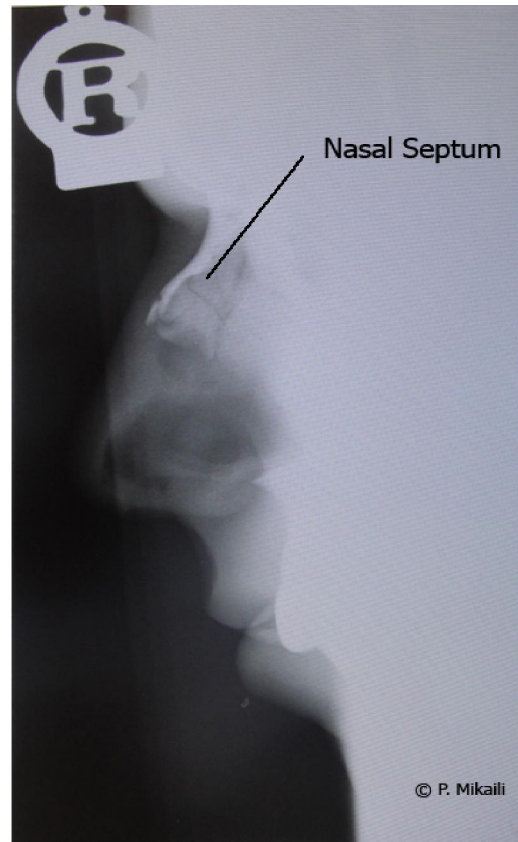


Figure 4: The radiography of a patients with nasal bone fracture, in lateral view.

Table 4: The profile of different types of nasal bone fracture forms (including lateral, frontal and green stick), according to occupation of the patients.

Occupation	Lateral	Frontal	Green stick	Total
Soldier	20	7	0	27
Pupil	105	12	0	117
Farmer	31	10	0	41
Worker	12	16	0	28
Businessmen	40	15	0	55
Housewife	50	27.2	0	57
Student	22	3	0	25

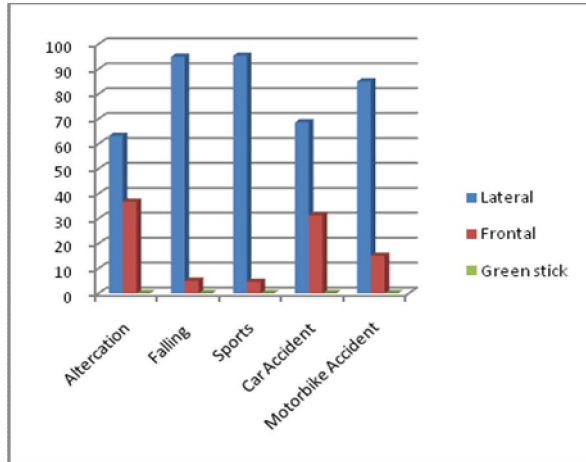


Figure 5: The frequency and percentage of the different types of nasal bone fracture, including lateral, frontal and green-stick, according to different age groups, regarding the etiological factors.

There were no significant difference in urban (n=212) and rural (n=138) nasal bone fracture ($p > 0.05$). In urban pattern 171 cases (80.6%) lateral and 41 (19.3%) frontal and in rural regions 109 cases (78.9%) and lateral cases 29 (21.01%).

4. Discussions

According to the literature, the facial traumas have been increasingly progressed during five recent decades due to the increasing the vehicle accidents and increasing the civil violence. According to the results of our study, the nasal bone fracture is more common in men (74.8%) in comparison with women (25.1%), which is in agreement with results of the previous reports (Logan, 1994; Nahum, 1975). The reasons of high prevalence of nasal bone fracture in men have been suggested since in the current community men are more involved in physically hard occupations. Regarding the results of our study, the more susceptible age group who had nasal bone fracture had ages ranging 11-20 years old (40.6%). These findings are consistent with the results of studies performed in 1977 in Japan and in 1998-2001 in AUE. It is because this age group belongs to adolescence period, which is the age of dangerous behavior causing to nasal bone fracture (Slupchynskyj, 1992; Stranc, 1979; Stucker, 1984).

Most facial fractures afflict people between the ages of 15 and 40 years and are three times more likely to occur in males. Nasal and facial fractures in adults are commonly reported to be the result of motor vehicle accidents (MVA), sports injury, altercations, or falls (Dingman, 1977). Patients who

have sustained nasal fracture during altercations will have a 15–20% chance of reporting a second nasal trauma. These patients' lifestyles afford a particular susceptibility to repeated facial trauma.

Injuries to the nose that occur during an altercation (e.g. a fist) tend to not injure other facial features. Conversely, motor vehicle accidents tend to result in severe nasal fractures that are frequently associated with additional maxillofacial injuries. When high impact trauma fractures the bones of the midface, the also nose tends to be injured. It is estimated that 28% of patients who sustain midfacial fractures experience an associated nasal fracture (Dingman, 1977). In this situation, the nasal fracture may be neglected resulting in a missed diagnosis. Children's noses are mostly cartilaginous and possess small nasal bones that are softer and more compliant, absorbing little of the energy from the force.

Similar to adults, older children and adolescents are also injured as a result of sports injury, MVA, and falls, however, also included are playground assaults and injuries from animals. It is important to not disregard abuse as a cause of childhood nasal trauma (Grymer, 1985). Also of particular importance in pediatric patients are sports related injuries, one of the most preventable causes of nasal fractures. Fifty percent of pediatric facial fractures are secondary to sports-related injury, and 65% of these patient will experience a nasal fracture. Following nasal trauma, children are especially susceptible to septal hematoma and its subsequent complications. The cartilages of the nose tend to buckle and twist rather than fracture, producing a separation between the perichondrium and the cartilage resulting in a hematoma. This can occur in the absence of nasal bone fractures, with minimal signs and symptoms of nasal trauma (Hampson, 1995). Unfortunately, childhood nasal trauma is often unappreciated, manifesting as external and internal nasal deformities in adult life.

In other studies, the main causes of nasal bone fracture have been reported as car accident, but in our study, we found that the violence and also struggle or fracas are the most common and the first cause (34%) and the falling is the second cause (33.4%) of nasal bone fractures (Holt, 1978; Illum, 1986). The difference between our study and other reports is due the cultural differences and current ritual and common legal codes of these societies. The most high occurrence of nasal bone fracture belonged to the school pupils, which is consistent with the study of others (Dingman, 1977; Grymer, 1985). To our best knowledge, this has not been reported in any other reports. According to the results of our study, the nasal bone fracture rate in urban regions (60.5%) is higher than rural region due to the high extensive

crowdedness and interpersonal interactions. Regarding our results, the lateral type nasal bone fracture (80%) were more common comparing with frontal nasal bone fracture (20%), which it is in agreement with other reports (Bailey, 1993; Dickson, 1986; Dingman, 1964).

5. Conclusion

The results of this study revealed a clear profile for the public health policy makers to plan the programs for preventing or at least, minimizing the nasal bone fracture rates in such societies. According to the findings of our study, the followings are suggested: instructing the people to enhance the cultural level to improve the interpersonal and individual interactions through mass media; enhancing the safety of pedestrian ways and crowded public places (to prevent the danger of falling); instructing people to observing the traffic rules to decrease the accident dangers; obligation of using the safety cap for motor-cyclists; and observing the safety codes high risk sport fields.

Acknowledgements

The authors wish to thank their honored colleague, Dr. Farhad Jamali, for his contributions in implementation of this study.

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6/20/2011