

Incidence of Mandibular Fractures Associated with Head Injury in Ninavah Governorate (2006-2007)

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الخلاصة

الهدف من الدراسة: تحذف الدراسة الى إيجاد العلاقة بين كسور الفك السفلي، مواقع وجهة الكسر المصاحبة لإصابات الرأس للمرضى المصابين في محافظة نينوى، **المواد وطرائق العمل:** تم جمع البيانات لكل حالات إصابات الرأس و الفك السفلي التي تم التعامل معها في جميع المستشفيات الحكومية العامة ومستشفيات الاقضية والمستشفيات الأهلية وكافة القطاعات الصحية في محافظة نينوى لمدة سنة واحدة ابتداء من (حزيران ٢٠٠٦) لغاية (أيار ٢٠٠٧) وشملت الدراسة العمر وأسباب الإصابة وأنواعها والمستشفيات. كذلك شملت الدراسة مواقع وجهة كسور الفك السفلي وتم توزيع النتائج بشكل جداول و تم استخدام مربع (كأي) و قيمة (P) الإحصائي. **النتائج:** ان إجمالي حالات إصابات الرأس كانت (٥٨٢٨) حالة، كان عدد حالات كسور الفك السفلي إجمالياً (٢٨٢) حالة، (٤.٨٤%) من إجمالي إصابات الرأس. وكانت كسور الفك السفلي المصحوبة بكلم الرأس (٧٦) حالة (١.٣%) من إجمالي إصابات الرأس. **الاستنتاجات:** الأطفال هي الفئة العمرية الأكثر عرضة للإصابات بينما سن الشيخوخة هي الأقل، الذكور هم الأكثر تعرضاً للإصابات بنسبة ١:٢، قلة حصول كسر للفك السفلي مصحوبة مع كسر الفك السفلي تعني عدم تأخير علاج كسور الفك السفلي والاستفادة من عامل الزمن، السقوط من المرتفعات وإصابات الشظايا والإطلاقات النارية كانت المسبب الرئيس لأغلب الحالات، وان كسور العظم السنخي كانت هي الأكثر تسجيلاً في الدراسة يتبعها كسور بدنه الفك السفلي

ABSTRACT

Aims: The aims of the study are to find the incidences, types, sides and sites of mandibular fracture accompanied with head injuries in Ninavah Governorate. **Materials and Methods:** Data of trauma cases were collected from general, local, private hospitals and health sectors in Ninavah Governorate with a head injury and mandibular fracture for one year duration from June 2006 to May 2007. Age, etiology, types, hospitals, sides and sites, distribution were arranged in tables, chi square and P value used for statistic analysis. **Results:** The total number of head injury cases was (5828). The total number of fractures mandible with and without head injury was (282) cases means (4.84%) of total number of head injury cases, while mandibular fracture with head injury cases incidence was (76) cases (1.3%) of total number of head injury cases. **Conclusions:** Children were the most common age group affected by head injury, while geriatric age group was the least. Male showed high percentage than female in a ratio about 2:1. Low incidence of association between head injury and fracture mandible which means that there is no need for delaying maxillofacial treatment. Falls from height and bullet injuries were the common cause of head injury and fracture mandible (dentoalveolar fractures showed high incidence followed by body fractures).

Key Words: Incidence, Mandibular Fracture, Head Injury, Trauma.

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INTRODUCTION

The human face constitutes the first contact point in several human interactions, thus injuries and/or mutilation of the facial structures may have a disastrous on the affected person⁽¹⁾. As our society becomes completely mobile and getting crowded, trauma emerges as one of the leading health problems. Injuries of the face and jaws are among the most frequent

injuries seen in the emergency unit⁽²⁾. The etiology of maxillofacial injuries varies from one country to another⁽³⁾. Approximately 20% of patients with maxillofacial injuries may have an associated head injury⁽⁴⁾. Injuries of the maxillofacial region may be disabling, for the presence of special sense⁽⁵⁾.

The bones of skull comprise 22 bones, brain box 8 bones, facial skeleton 14

bones, six paired maxilla, zygoma, nasal, lachrymal, palatine, inferior nasal conchae, single bone vomer and mandible⁽⁶⁾. Layers of scalp are skin, connective tissues, aponeurosis, loose areolar tissue, pericranium. Bone consists of outer table, diploe, inner table. Meninges consist of dura matter, arachnoid membrane, pia matter. These layers enclosing brain parenchyma which bathed in the cerebrospinal fluid⁽⁷⁾. Mandible is freely movable bone⁽⁸⁾, forming the lower border of the face⁽⁹⁾, it is tubular long bone which bends into V shaped, consists of the condyle, coronoid process, ramus, angle, body, parasymphysis, symphysis, Dentoalveolar carrying lower teeth⁽⁶⁾. The muscles of mastication attached to the mandible are masseter, temporalis, medial & lateral pterygoids⁽¹⁴⁾.

Head Injury: It can be defined as any alteration in the mental or physical functioning related to a blow to the head. Loss of consciousness does not need to occur⁽¹⁰⁾. Injury to the head may damage the scalp, skull, or brain. The most important consequences of head trauma are traumatic brain injury (head injury may be opened or closed). The most common causes of head injury are traffic accidents, home and occupational accidents, falls, assaults. The symptoms include loss of consciousness, confusion, drowsiness, personality change, seizures, nausea, vomiting, headache, and a lucid interval⁽¹¹⁾. For diagnosis, the Glasgow coma scale is a tool for measuring the degree of unconsciousness and determining the severity of injury⁽¹²⁾, as shown in Table (1).

Table (1): Glasgow Coma Scale

Eye opening score	>1 year	<1 year
4	Spontaneously	Spontaneously
3	To verbal command	To shout
2	To pain	To pain
1	No response	No response
Best motor response		
6	Obeys command	Obeys command
5	Localizes pain	Localizes pain
4	Flexion withdrawal	Flexion withdrawal
3	Flexion abnormal	Flexion abnormal
2	Extension	Extension
1	No response	No response
Best verbal response		
5	Oriented and converses	Cries appropriately
4	Disoriented and converses	Cries
3	Inappropriate words	Inappropriate crying
2	Incomprehensible sounds	Grunts
1	No response	No response

In addition to routine neurological evaluations, computerized tomography C.T. scan, magnetic resonance imaging M.R.I. or positron emission tomography PET, electroencephalogram EEG also may be used⁽¹¹⁾.

The aims of the present study are to find the incidence of mandibular fractures accompanied with head injuries in Ninawa Governorate and to identify the common types, sides and sites of mandibular fractures associated with head injuries. This

will help in establishing good treatment plan.

MATERIALS AND METHODS

The study is a prospective survey for patients with a sustained head injury and mandibular fracture. The period of this study was a one year duration starting with the first June 2006 and ending in May 2007 in Ninawa Governorate. Data were collected from general hospitals in Nineveh Governorate (Al-Jumhuri Teaching Hospital, Al-Salam Hospital, Al-Mosul

RESULTS

Hospital, Ibn-Sina Hospital) . Also the data were collected from local hospitals (Al-Khansa Hospital , Ibn-Alather Hospital, Al-Shekhan Hospital, Telafer Hospital, Sinjar Hospital, Al-Humdania Hospital, Baaj Hospital) and (11) health sectors and private hospitals (Al-Zahrawee Hospital, Al-Rabee Hospital, Ninavah Hospital, Al-Rahma Hospital) the study enrolled all traumatized patients attending these hospitals and health sectors. The data collected included age , sex, etiology, type of fracture, geographical allocation and hospitals, monthly distribution, mandibular bone fracture type , side, site, and number of fracture sites, distribution were arranged in tables with the incidence of each. statistical analysis was done by using Chi square and P-values.

The total number of population living in Ninavah Governorate is (2922933) persons, according to Ninavah Governorate statistics and health sector statistics. The total number of trauma cases in general were (23350) cases, head injury cases (5828) cases (25%) out of total trauma cases, while mandibular fracture with head injury cases showed an incidence of (76)cases, being (0.33%) out of total trauma cases, and (1.3%) of total number of head injury cases. The total number of fractured mandibles with and without head injury was (282) cases being (1.2%) out of total trauma and (4.84%) of the total number of head injury cases. Figure (1) showed the distribution of head injury and fractured mandible according to type of head injury, where the scalp wound recording the highest incidence.

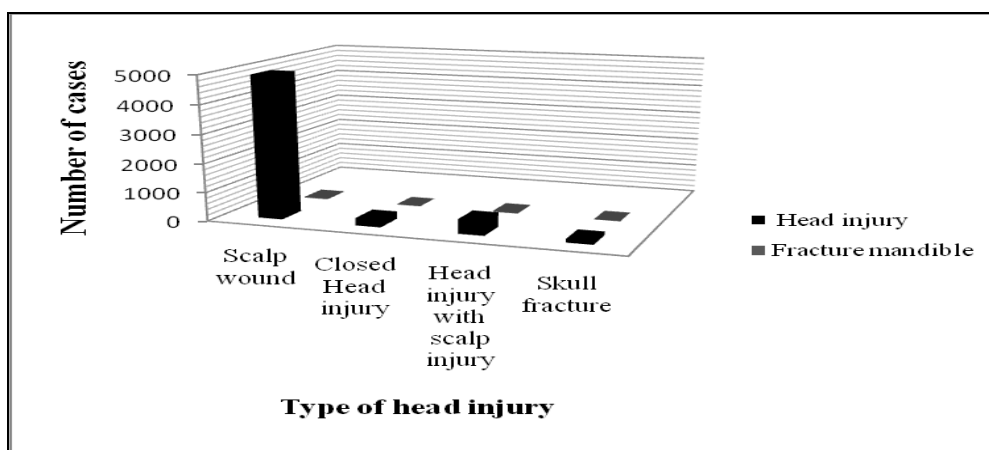


Figure (1): Distribution of head injury & fracture mandible according to type of head injury

Figure (2) showed the incidence of fractured mandible according to site, as the

dentoalveolar type of fracture was the highest, followed by body fractures.

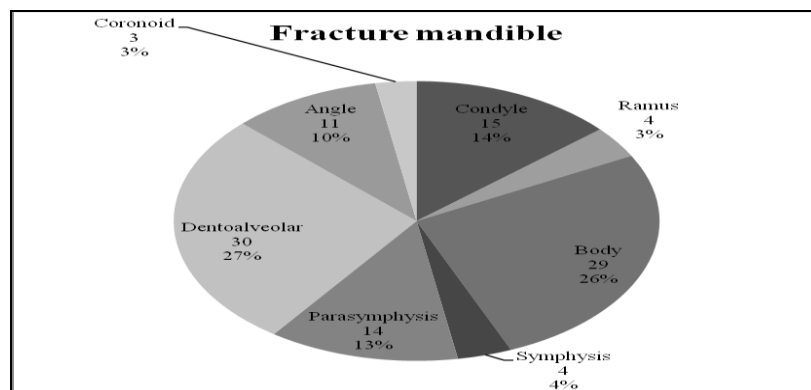


Figure (2): Incidence of fracture mandible according to site

Table (2) showed the distribution of head injury and fractured mandible according to hospitals, where Al-Jumhori Hospital re-

ceived the highest number of head and mandible trauma cases.

Table (2): Distribution of head injury & fracture mandible according to hospitals

Hospitals	Head injury	%	Fracture mandible	%	P value*	Chi square
Aljumhori	2054	35.2	46	60.5	0.001	20.925
Alsalam	905	15.5	21	27.6	0.004	8.31
Ibin-Sina	400	6.9	0	0	0.018	5.595
Others	2469	42.4	9	11.8	0.001	28.696
Total	5828	100	76	100		

* P value ≤ 0.05 significant, P value > 0.05 not significant

Table (3) showed the incidence of head injury and fracture mandible according to age with less than 10 years old

more affected followed by 21-30 years (young age group).

Table (3): Incidence of head injury & fracture mandible according to the age

Age	Head injury	%	Fracture mandible	%	P value*	Chi square
<10 years	2307	39.6	25	32.9	0.236	1.405
11-20 y.	1035	17.8	12	15.8	0.655	0.199
21-30 y.	1946	33.4	24	31.6	0.739	0.111
31-40 y.	335	5.7	8	10.5	0.077	3.13
41-50 y.	152	2.6	3	3.9	0.468	0.526
>50	53	0.9	4	5.3	0.001	14.873
Total	5828	100	76	100		

* P value ≤ 0.05 significant, P value > 0.05 not significant

Table (4) showed the etiological incidence of head injury with falls from height and bullet injury being the most

common cause of head injury while road traffic accidents & bullet injuries the common cause of fracture mandible.

Table (4): Aetiological incidence of head injury

Causes of head injury	Number	%	Fracture mandible	%	P value*	Chi square
Fall from height	1763	30.3	11	14.5	0.854	0.112
Fight	169	2.9	10	13.2	0.009	74.654
Road traffic accident	1181	20.3	24	31.6	0.876	0.221
Bullet injury	1688	29	25	32.9	0.754	0.133
Strike by object	261	4.5	2	2.6	0.764	0.141
Sport injury	15	0.3	1	1.3	0.006	8.31
Other causes	751	12.9	3	3.9	0.004	9.643
Total	5828	100	76	100		

* P value ≤ 0.05 significant, P value > 0.05 not significant

DISCUSSION

Traumatic head injuries and associated fractures of the mandible are increasingly

happening specially in the last years in our country, mostly due to war injuries and abnormal situations.

There was a significant relation in the following: age, hospital incidence, type of head injury. Scalp injury represents 48.8% of total head injury, closed head injury 4.5% mostly due to bullet and shell injury as that period had a lot of violence in the Governorate. Fall from heights was the most common cause of head injury which came in agreement with Alissa A⁽¹³⁾. On the contrary, Adekeye showed that the parasymphysal region was commonly affected⁽¹⁴⁾. In our study left side mandibular fractures more than the right side, this may be due to the predominance of right handed peoples. In addition dentoalveolar fractures, body fractures and condyle fractures in sequence and this came in agreement with Al-Rawee RY⁽¹⁵⁾, but disagreed with Schug T as most fractures occur in body followed by the condyle due to different place of the study, Al-Jumhori hospital received the major number of patients because other hospitals had no causality unit, adding to that the presence of all surgical and medical branches facilitating the shifting of trauma cases. According to age children up to 10 years were the most involved because of their high mobility. Males are more boisterous than females and are workers, fighters, drivers, explaining why they are more affected than females. Major cities higher percentage of trauma cases than other areas, because of people crowding and high dynamic actions⁽¹⁶⁾.

CONCLUSIONS

Trauma is not uncommon in Mosul City. Children are the most common age group affected by head injury, while geriatric age group is the least affected group by trauma. Male shows high percentage of head injury and mandibular fracture than female in a ratio of about 2:1. A low incidence of association between head injury and fracture mandible means no need for delaying maxillofacial treatment. People living in the city are more prone to trauma than rural regions, as well as those who attended Al-Jumhori Hospital. Bullet injuries and falls from height are the common cause of head injury and fracture mandible. Dentoalveolar fractures showed high incidence followed by body fractures.

REFERENCES

1. Oginni FO, Fagsde OO, Akinwande JA, Arole GF, Odusanya SA. Pattern of soft tissue injuries to the oto-facial region in Nigerian children attending a teaching hospital. *In. J. Paediatric dent.* 2002; 12:201.
2. Luci, E A, Tubb, T D, Moore, A.M. Review of 1000 major facial fractures & associated injuries, *Plastic & reconstructive surgery* 1979; 63:26-29.
3. Ugboko VI, Odusanya SA, Fagade OO. Maxillofacial fractures in a semi urban Nigerian teaching hospital. A review of 442 cases. *Int J Oral Maxillofacial Surg* 1998; 27:286-9.
4. Magennis P, Shepherd J, Hutchinson I, Brown A. Trend in facial injuries increasing violence more than compensates for decreasing road trauma. *BMJ* 1998; 316:325-6.
5. Goodisson D, MacFarlane M, Snap L, Darwish B. Head injury and associated maxillofacial injury. *NZ med J* 2004; 117:1045.
6. Churchia B.D, Human Anatomy, Regional and applied head and neck and brain. 6th ed 3C.B.S. publisher & distributor, Delhi, India: 1986;1-17, 172-209.
7. Dalley AF, Gloud DJ. Layers of Scalp and Meninges. *Dynamic Human Anatomy*, 2nd ed, Livingstone, 2005; 123-125.
8. Rowe NL, Killey HC Fracture of the facial skeleton, 2nd ed, E and S Livingstone, Edinburgh & London 1970; 3-14, 205-230.
9. Rowe NL, and Williams Jli Maxillofacial injuries Churchill Livingstone, Edinburgh & London and New York, 1985; vol 1:1-41.
10. Sumas M.E, Narayan N.K, head injury, In Grossman G.R, Loftus C.M, eds. Principles of Neurosurgery. 2nd ed. Philadelphia PA: Lippincott Raven; 1999: 117-71.
11. Weiner, William J, Neurology for the non-neurologist. 3rd ed. Philadelphia JB: Lippincott Raven; 1994; 245-260.
12. Bullock R, Chesnut R, Clifton G, Guidelines for the management of severe head injury. Brain trauma foundation, American Association of Neurological surgeons, joint section on Neurotrauma & critical care. *J Neurotrauma* 1996 Nov; 13(11): 641-734.
13. Alissa A. Radiological finding in patients who attended the emergency department

- with head injury .*The middle east journal of emergency medicine* 2003 ; 3 (1): 1-4 .
14. Adekeye EO: The pattern of fractures of the facial skeleton in Kaduna, Nigeria. A survey of 1447 cases. *Oral surg. Oral med. Oral pathol.* 1980 Jun; 49(6): 491-5.
 15. Al-Rawee RY , Incidence of maxillofacial trauma in Ninavah Governorate1995-1996, Thesis of degree of master , University of Mosul , College of dentistry1997, chapter 7 : 88-92.
 16. Schug T, Rodmer H, Neupert W, Dumbach J: Treatment of complex mandibular fractures using titanium mesh. *J craniomaxillfacial surgery* 2000 Aug.; 28(4): 235-7.