Oral Factors Predisposing to Injury of Permanent Incisors in School Children in Al-Ramadi City

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ABSTRACT

Dental trauma is a serious public problem causing psychology, aesthetic, Social and therapeutic problems and its irreversible pathology that after occurrence is characterized by life-long debilitating effects.

This study aimed to investigate the oral risk factors for injury to maxillary permanent incisors among Al-Ramadi schoolchildren aged 6-13 years, the result clarified frequency of traumatically injured teeth increase in class II division I, lip incompetent with increase over jet and overbite value more than 4mm but only the over jet more than 4mm and lip incompetent reach the level of significant (p< 0.01)

Thus, special preventive program and correction of predisposing risk factors should be carried out in early mixed dentation

Key words: Traumatic teeth, occlusion, overbite, over jet, lip position

1. INTRODUCTION

One of the greatest assets a person can have is a "smile" that shows beautiful, natural teeth. An untreated and unsightly fracture of an anterior tooth can affect the behavior of a child, his progress in school, and can have more impact on their daily living. \(^1\) Traumatic dental injury has become the most serious dental public health problem in children since a remarkable decline in the prevalence and severity of dental caries in many countries. \(^2\)

Nearly all studies that conducted around the world concerning traumatic dental injury showing that boys more affected by incisor trauma than girls. \(^3\) While other studies demonstrated that there were non-significant difference in prevalence of trauma injuries with gender. \(^4\)

On other hand, some studies found that there was significant difference in the prevalence traumatic dental injury with class II division malocclusion. \(^5\) and also found higher prevalence traumatic dental injury in relation to increase over jet more than 4 mm \(^6\) while other found no relation. \(^3\)

Furthermore the prevalence of traumatic dental injury was highly greater in subjects with over bite more than 4mm compared with normal. \(^7\)

Lip position has been previous study by many authors some authors showed that children with inadequate lip coverage were at greater risk to trauma. \(^5\) \(^8\) while other found no relation \(^3\)

In the Al-Anbar, there's only one published literature is available on the prevalence of traumatic injuries to anterior teeth in mixed dentition period \(^9\). Hence, this study was carried to determine the predisposing risk factors of fractured anterior teeth among 6++6-13 years school children of the ramadi city.

2. MATERIAL AND METHOD

Clinical oral examination were carried out in a chair with a tall back and examination were conducted under an artificial light, standardization was made according to (WHO, 1997) \(^10\)

A study involving 1830 students between the age (6-13) years old were participated in the study, after clinical examination, 310 student had sustained traumatic crown fracture for their maxillary permanent incisor, 180 (58.07) were boy, 130 (41.93) were girls. All students with chronic disease or permanent body deforming or non traumatic dental injuries or student with restored anterior teeth whom the causes of restoration was not due to traumatic fracture of the tooth should be excluded from the sample.

Visual and tactile examination were performed, root fracture were not recorded, as routine dental per apical radiographs were not taken due to technical difficulties

Type of occlusion (incisal relationship) was recorded according to British standard classification \(^11\)
4. DISCUSSION

Traumatic dental injury is not a result of disease but a consequence of several factors that will accumulate throughout life if not properly treated.\(^7\)

Finding that boys (58.07\%) experienced dental trauma more frequently than the girls (41.93\%), agrees with other similar studies from across the world.\(^{18,19}\) The relatively low prevalence of trauma in girls can be explained by the fact that girls are generally more mature in their behavior than boys, who tend to be energetic and inclined toward vigorous outdoor activities.\(^{20}\) Vandersand and papagianuol is pointed out higher level of epinephrine, dopamine and emotional stress in boys.\(^{19}\)

The prevalence of traumatized teeth was found to be high percentage with class II malocclusion particular division I compared to class I occlusion.\(^5,20\) the significant difference between the adequate and inadequate lip position (55.17\%,44.83\%) respectively because inadequate lip coverage may provide less protection to mal occlusion incisor and thus easily contribute to the increased risk of coronal fracture and mostly when there’s incompetent lips there’s procaine anterior teeth \(^8\),and this was in line with Agharred G AL-Kassab and kania etalthis.\(^20\)

Result may be explained by; in case of normal occlusion the energy of trauma is decreased by the larger contact area, the incisal contact of upper and lower teeth and the protecting effect of the lip closure, while in case with class II mal occlusion, the lack of incisal contact, or the location of this contact in the cervical part of the upper incisor or the uncompleted lip closure all these increase the risk of being traumatized in children with class II mal occlusion.\(^5,20\) the significant difference between the adequate and inadequate lip position (55.17\%,44.83\%) respectively because inadequate lip coverage may provide less protection to mal occlusion incisor and thus easily contribute to the increased risk of coronal fracture and mostly when there’s incompetent lips there’s procaine anterior teeth \(^8\),and this was in line with Agharred G AL-Kassab and kania etalthis.\(^20\)

An over jet more than 4mm was more obvious crown fracture in children than other rang values of the total sample , this finding corroborated other studies that found Children with increased over jet were more likely to have dental injuries than other children \(^6,22\),but collided with and marcenesetal and this finding can explained by the prominent position of incisor teeth and lack of contact between these teeth with corresponding of lower jaw and presence of short upper lip, all these can robust the over jet to be principle modifiable risk factor for maxillary incisor trauma \(^{23}\).

Prominent association was found between increased over bite more than 4mm and coronal fracture as in table (4). This was in accordance with previous finding like shuluman and Peter son\(^7\). Overtly as the deep bite may usually be association with class II malocclusion\(^{24}\), so the high prevalence of coronal fractures may be confined to this type of malocclusion rather than increased overbite.
The said study observed the children in mixed dentition period as the population at risk. Hence, prevention through health promotion and correction of predisposing risk factors should be carried out in early mixed dentition period to reduce the prevalence of dental injury and to avoid the financial costs of treatment. An effort can be made to reduce the prevalence of traumatic injuries by taking into consideration the following measures.

- The use of intraoral and extraoral devices which protects the face and teeth from trauma.
- Elimination or reduction of predisposing factors in the form of orthodontic treatment.
- Educational programs where by the children and their parents are given information regarding the preventive and treatment aspects of this commonly occurring condition.
- Health promotion policies should aim to create an appropriate and safe environment.

REFERENCES


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**Table 1:** The distribution of children with traumatized teeth by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total NO</th>
<th>%</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>180</td>
<td>58.07</td>
<td>7.8 **</td>
</tr>
<tr>
<td>Girls</td>
<td>130</td>
<td>41.93</td>
<td>7.5</td>
</tr>
<tr>
<td>Total sample</td>
<td>310</td>
<td></td>
<td>15.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Z=21.5**</td>
</tr>
</tbody>
</table>

**Table 2:** The Distribution of children with traumatized teeth in relation to type of occlusion (incisal relationship)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Class 1 occlusion NO%</th>
<th>Class 11 Division 1 NO%</th>
<th>Class 11 Division 2 NO%</th>
<th>Class 111 mal occlusion NO%</th>
<th>Total</th>
<th>Sig</th>
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<tbody>
<tr>
<td>Boys</td>
<td>18 10</td>
<td>152 84.4</td>
<td>7 3.88</td>
<td>3 0.166</td>
<td>180</td>
<td>NS</td>
</tr>
<tr>
<td>Girls</td>
<td>40 30.76</td>
<td>80 61.5</td>
<td>10 7.69</td>
<td>0</td>
<td>130</td>
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<tr>
<td>Total sample</td>
<td>50 18.7</td>
<td></td>
<td>232 74.8</td>
<td>17 5.48</td>
<td>310</td>
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</table>

**Table 3:** The Distribution of children according to lip position

<table>
<thead>
<tr>
<th>Gender</th>
<th>Inadequate lip position NO%</th>
<th>Adequate lip position NO%</th>
<th>Total Sig</th>
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<tbody>
<tr>
<td>Boys</td>
<td>100 55.55</td>
<td>80 44.44</td>
<td>180 *</td>
</tr>
<tr>
<td>Girls</td>
<td>17 54.61</td>
<td>59 45.38</td>
<td>130</td>
</tr>
<tr>
<td>Total sample</td>
<td>171 55.17</td>
<td></td>
<td>139 44.83</td>
</tr>
</tbody>
</table>

**Table 4:** The Distribution of children with traumatized teeth according to over jet and overbite

<table>
<thead>
<tr>
<th>Gender</th>
<th>over jet</th>
<th>Zero mm NO%</th>
<th>&lt;2mm NO%</th>
<th>2-4mm NO%</th>
<th>&gt;4mm NO%</th>
<th>Total sig</th>
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</thead>
<tbody>
<tr>
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<td></td>
<td>13 7.22</td>
<td>21 11.66</td>
<td>44 24.4</td>
<td>102 56.4</td>
<td>180 *</td>
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<tr>
<td>Girls</td>
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<td>16 12.3</td>
<td>47 36.15</td>
<td>62 97.69</td>
<td>130</td>
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<tr>
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<td>37 11.93</td>
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Overbite

<table>
<thead>
<tr>
<th>Gender</th>
<th>over jet</th>
<th>Zero mm NO%</th>
<th>&lt;2mm NO%</th>
<th>2-4mm NO%</th>
<th>&gt;4mm NO%</th>
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<tbody>
<tr>
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<td>5 2.77</td>
<td>45 25</td>
<td>40 19.130</td>
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<tr>
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<td>23 17.69</td>
<td>48 36.92</td>
<td>51 39.23</td>
<td>130</td>
</tr>
<tr>
<td>Total sample</td>
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<td>68 21.93</td>
<td>88 28.38</td>
<td>151 48.7</td>
<td>310</td>
</tr>
</tbody>
</table>

* Significant p< 0.01 ,  ** Highly Significant p< 0.001,
NS Non significant P>0.05