

## Research Article



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## EVALUATION OF OROFACIAL FEATURES IN THE VICTIMS OF ABUSE AND NEGLECT OF 5–16-YEAR AGE CHILDREN

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### ABSTRACT

**Background:** The oral cavity is taken as a vital and focal point in cases of abuse or physical assault owing to its role in nutrition and communication. Dentists having appropriate training in the curriculum for child abuse can help and assist physicians concerning dental and oral aspects of child neglect and abuse.

**Aim:** The present study aimed to assess the orofacial features in the victims of abuse and neglect of 5–16-year-old children.

**Methods:** The present study assessed 500 child subjects in the age range of 5 years and 16 years. All the included subjects were suspected of the victims of child neglect or child abuse. In all the subjects, orofacial features were critically assessed by a dentist well-trained in the curriculum.

**Results:** In the included 500 subjects, 30% (n=144) subjects presented with lacerations at various sites including the floor of the mouth in 3.6% (n=18), palate in 6.4% (n=32), buccal mucosa in 10.4% (n=52), frenum in 3.2% (n=16), and lip in 5.2% (n=26) study subjects respectively. Features of avulsion were seen in 11.6% (n=58) of subjects. Deposits, missing teeth, dental caries, and dentoalveolar fractures were seen in 100% (n=500), 7.6% (n=38), 41.6% (n=208), and 7.2% (n=36) subjects respectively.

**Conclusions:** The present study concludes that it is vital to conduct a comprehensive perioral and intraoral assessment is vital for the subjects victim of child neglect or child abuse as the oral cavity is a vital point for assessing the physical abuse which can be associated with its vital role in nutrition and communication. Dentists and physicians should work in collaboration for better detection, prevention, and treatment of such conditions.

**Keywords:** Avulsion, child abuse, fracture, neglect, sexual abuse.

### INTRODUCTION

Dental caries, malocclusion, and child abuse are considered as most prevalent concerns affecting children Worldwide including in India. Child abuse is a condition that signifies any act of commission that impairs or imperils the development, emotional health, sexual health, or physical health of a child. Violence is considered an omission or act by society, guardians, relatives, or parents that lead to emotional, sexual, or physical damage to the victims.<sup>1</sup>

Maltreatment of a child is defined as all forms of emotional and physical ill-treatment, exploitation, neglect, or sexual abuse that leads to either potential or actual harm to the dignity, development, or health of the child as defined by WHO (World Health Organization). Child abuse can be classified into four types sexual abuse, psychological abuse, physical abuse, and neglect. Maltreatment of a child constitutes one of the most significant risk factors for retarded development, morbidity, and contemporaneous psychopathology in children.<sup>2</sup>

The highest number of working children globally is attributed to the Indian population with the largest number of children that are exposed to physical or sexual abuse. Nearly 2% to 10% of child subjects exposed to abuse are reported to be in hospital. However, the incidence of child neglect or child abuse might vary as it is affected by both victims and perpetrators. A clinical condition, known as battered child syndrome is a common cause of death or permanent disability which is characterized by evidence of skin bruising, soft-tissue swellings, failure to thrive, subdural hematoma, or fracture of any bone in a child that dies unexpectedly with trauma history and dissent degree of injury. Battered child syndrome was introduced in 1962 by Dr Henry Kempe.<sup>3</sup>

Previous literature studies have reported that nearly half of the children who are physically abused depict the signs of orofacial abuse including bruising or abrasions on the frenum, alveolar mucosa, lips, tongue, gingiva, hard palate, and soft palate along with tattoo injuries, burns, jaw fractures, and avulsions. Children who are neglected may also present with poor oral hygiene signs such as aphthous ulcers secondary to nutritional deficiency, calculus and plaque deposits, odontogenic infections, untreated dental caries with progression, and halitosis. These deleterious effects can have adverse effects on the normal development, growth, communication, and learning of this subjects.<sup>4</sup>

The oral cavity is taken as a vital and focal point in cases of abuse or physical assault owing to its role in nutrition and communication. Lips may present with burns from cigarettes and hot food, ecchymosis, hematoma, or lacerations. Teeth might present with mobility, avulsions, dislocations, fractures, or pulpal necrosis. Lacerations or abrasions might be seen in the floor of the mouth, palate, tongue, gingiva, or frenum that can be secondary to burning utensils or hot food. Jaw fractures can be seen as fractures of orbit, zygomatico-maxillary complex, nasal bone, mandibular symphysis, ascending ramus of mandible, and the condyle. Dentists with appropriate training in the curriculum for child abuse can help in attaining valuable information and assistance to the physicians concerning dental and oral aspects of child neglect and child abuse.<sup>5</sup> Hence, the present study aimed to assess the orofacial fracture in victims of abuse and neglect of 5–16-year-old children.

## **MATERIALS AND METHODS**

The present clinical study aimed to assess the orofacial fracture in victims of abuse and neglect of 5–16-year-old children. The study subjects were from the Department of Forensic Medicine and Toxicology of the Institute. Verbal and written informed consent was taken from parents/guardians of the study subjects before the participation.

The study assessed 500 child subjects from the Outpatient Department of Pediatrics of the Institute. The study included subjects from both genders who were within the age range of 5 years to 16 years. All the included subjects were the suspected victims of child neglect and child abuse. The exclusion criteria for the study were subjects that were not mentally sound, had a history of self-inflicting injuries, lip bite history, and subjects whose parents were not willing to provide consent for the study.

After final inclusion, detailed history was recorded for all the participants along with the comprehensive orofacial clinical assessment. All the subjects were assessed by an experienced and well-trained dentist who is an expert in their field. In all the participants, orofacial features were carefully assessed and noted. The orofacial features assessed in the study subjects were as follows: calculus and plaque deposits, missing teeth, dental caries and decayed teeth, dento-alveolar fractures, avulsion, and/or lacerations.

The data gathered were analyzed statistically using the SPSS software version 21.0 (IBM Corp., Armonk, NY, USA) and the chi-square test. The data were expressed as mean and standard deviation and frequency and percentage. Statistical significance was kept at a p-value of <0.05.

## **RESULTS**

The present clinical study aimed to assess the orofacial fracture in victims of abuse and neglect of 5–16-year-old children. The study included 500 subjects from both genders who were within the age range of 5 years to 16 years. There were

52.4% (n=262) males and 47.6% (n=238) female participants in the study. Among study subjects, 30% (n=144) lacerations at various sites were seen including the floor of the mouth in 3.6% (n=18), palate in 6.4% (n=32), buccal mucosa in 10.4% (n=52), frenum in 3.2% (n=16), and lip in 5.2% (n=26) study subjects respectively. Features of avulsion were seen in 11.6% (n=58) of subjects. The mean and median for a laceration in subjects aged 5-10 years were  $2.24\pm 0.88$  and 16 respectively, whereas, for subjects aged 11-16 years, the mean and median were  $2.3\pm 0.778$  and 16.3 respectively.

The study results showed that the features of avulsion were seen in 11.6% (n=58) of study subjects. The mean and median for avulsion in study subjects aged 5-10 years were  $1.004\pm 0.72$  and 16 respectively. The mean and median of avulsion in child participants of the study were  $0.98\pm 0.636$  and 16.6 respectively as shown in Tables 1 and 2.

It was seen that in children aged 5-16 years, dento-alveolar fracture was seen in 7.2% (n=36) of study subjects. The mean and median for dentoalveolar fracture in study subjects aged 5-10 years were  $0.870\pm 0.57$  and 16.6 respectively. The mean and median of dentoalveolar fracture in child participants of the study were  $0.334\pm 0.372$  and 16.4. respectively.

In 41.6% (n=208) of study participants, dental caries were recorded on the intraoral assessment. The mean and median for dental caries in study subjects aged 5-10 years were  $3.22\pm 1.33$  and 16.2 respectively. The mean and median of dental caries in child participants of the study were  $3.78\pm 1.66$  and 16.13 respectively as summarized in Tables 1 and 2.

The study results showed that concerning the assessment of missing teeth, teeth were missing in 7.6% (n=38) of study subjects. The mean and median for missing teeth in study subjects aged 5-10 years were  $0.544\pm 1.03$  and 14.4 respectively. The mean and median of missing teeth in child participants of the study were  $0.86\pm 0.132$  and 14.4 respectively as summarized in Tables 1 and 2.

Deposits of plaque and calculus were seen in 100% of subjects from both age groups. The mean and standard deviation for plaque and calculus deposits in study subjects aged 5-10 years was  $7.925\pm 0.7809$  and 16 respectively. The mean and median of plaque and calculus deposits in child participants of the study were  $8.04\pm 0.294$  and 14.8 respectively.

## DISCUSSION

The study included 500 subjects from both genders who were within the age range of 5 years to 16 years. There were 52.4% (n=262) males and 47.6% (n=238) female participants in the study. Among study subjects, 30% (n=144) lacerations at various sites were seen including the floor of the mouth in 3.6% (n=18), palate in 6.4% (n=32), buccal mucosa in 10.4% (n=52), frenum in 3.2% (n=16), and lip in 5.2% (n=26) study subjects respectively. Features of avulsion were seen in 11.6% (n=58) of subjects. The mean and median for a laceration in subjects aged 5-10 years were  $2.24\pm 0.88$  and 16 respectively, whereas, for subjects aged 11-16 years, the mean and median were  $2.3\pm 0.778$  and 16.3 respectively. These data were similar to the studies of Harris JC et al<sup>6</sup> in 2009 and Ramazani N<sup>7</sup> in 2014 where similar incidence of various oral injuries was reported by the authors in the present study.

It was seen that the features of avulsion were seen in 11.6% (n=58) of study subjects. The mean and median for avulsion in study subjects aged 5-10 years were  $1.004\pm 0.72$  and 16 respectively. The mean and median of avulsion in child participants of the study were  $0.98\pm 0.636$  and 16.6 respectively. These results were consistent with the findings of Montecchi PP et al<sup>8</sup> in 2009 and Melo M et al<sup>9</sup> in 2019 where authors reported similar results for avulsion as oral injury in their study subjects as seen in the present study.

The study results showed that in children aged 5-16 years, dento-alveolar fracture was seen in 7.2% (n=36) of study subjects. The mean and median for dentoalveolar fracture in study subjects aged 5-10 years were  $0.870\pm 0.57$  and 16.6 respectively. The mean and median of dentoalveolar fracture in child participants of the study were  $0.334\pm 0.372$  and 16.4. respectively. These findings were in agreement with the results of Andersson L et al<sup>10</sup> in 2012 and Dua R et al<sup>11</sup> in 2012 where dentoalveolar fracture incidence in an oral injury similar to the present study was reported by the authors in their respective studies.

Among 500 subjects, in 41.6% (n=208) of study participants, dental caries were recorded on the intraoral assessment. The mean and median for dental caries in study subjects aged 5-10 years were  $3.22\pm 1.33$  and 16.2 respectively. The mean and median of dental caries in child participants of the study were  $3.78\pm 1.66$  and 16.13 respectively. These results were in line with Naidoo S<sup>12</sup> in 2000 and Nagrajan SK<sup>13</sup> in 2018 where the incidence of dental caries in children aged 5-18 years was comparable to dental caries incidence in present study subjects.

The study results showed that concerning the assessment of missing teeth, teeth were missing in 7.6% (n=38) of study subjects. The mean and median for missing teeth in study subjects aged 5-10 years were 0.544±1.03 and 14.4 respectively. The mean and median of missing teeth in child participants of the study were 0.86±0.132 and 14.4 respectively. These findings followed Vitiello K<sup>14</sup> in 2012 and Costacurta M et al<sup>15</sup> in 2015 where missing teeth recorded by authors in the mentioned age group were comparable to preset study results.

Concerning the deposits of plaque and calculus in study subjects, they were seen in 100% of subjects from both age groups. The mean and standard deviation for plaque and calculus deposits in study subjects aged 5-10 years was 7.925±0.7809 and 16 respectively. The mean and median of plaque and calculus deposits in child participants of the study were 8.04±0.294 and 14.8 respectively. These results were comparable with the studies of Duda JG et al<sup>16</sup> in 2017 and Gonzalez D et al<sup>17</sup> in 2020 where the authors suggested that plaque and deposits are present in all the child subjects aged 5-16 years.

## CONCLUSIONS

Within its limitations, the present study concludes that it is vital to conduct a comprehensive perioral and intraoral assessment is vital for the victim of child neglect or child abuse as the oral cavity is a vital point for assessing the physical abuse that can be associated with its vital role in nutrition and communication. Dentists and physicians should work in collaboration for better detection, prevention, and treatment of such conditions. However, further studies in multi-institutional setup are needed to reach a definitive conclusion.

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**TABLES**

| Parameter          | Deposits     | Missing teeth | Decayed teeth | Dento-alveolar fractures | Avulsion   | Laceration |
|--------------------|--------------|---------------|---------------|--------------------------|------------|------------|
| <b>Mean ± S. D</b> | 7.925±0.7809 | 0.544±1.03    | 3.22±1.33     | 0.870±0.57               | 1.004±0.72 | 2.24±0.88  |
| <b>Median</b>      | 16           | 14.4          | 16.2          | 16.6                     | 16         | 16         |
| <b>Variance</b>    | 0.6104       | 1.1076        | 1.18235       | 0.3586                   | 0.5582     | 0.8271     |
| <b>t-value</b>     | -0.3447      | 0.4123        | 1.1643        | 0.5084                   | -0.332     | 0.0741     |
| <b>p-value</b>     | 0.64         |               |               |                          |            |            |

**Table 1: Pathological conditions in study participants aged 5-10 years**

| Parameter          | Deposits   | Missing teeth | Decayed teeth | Dento-alveolar fractures | Avulsion   | Laceration |
|--------------------|------------|---------------|---------------|--------------------------|------------|------------|
| <b>Mean ± S. D</b> | 8.04±0.294 | 0.86±0.132    | 3.78±1.66     | 0.334±0.372              | 0.98±0.636 | 2.3±0.778  |
| <b>Median</b>      | 14.8       | 14.4          | 16.13         | 16.4                     | 16.6       | 16.3       |
| <b>Variance</b>    | 1.6643     | 0.1289        | 0.4723        | 0.1397                   | 0.4073     | 0.6097     |
| <b>t-value</b>     | -1.5935    | -0.3855       | 0.3245        | -1.1950                  | -0.8373    | -0.1843    |
| <b>p-value</b>     | 0.54       |               |               |                          |            |            |

**Table 2: Pathological conditions in study participants aged 11-16 years**