Oral injuries in children: comparison of those children who visit and do not visit the afterhours clinic after telephone consultation

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Abstract - Pediatric patients who sustain oral and dental injuries during the evening or night require telephone consultation and/or examination at our regional medical center in the oral surgery clinic. Between April 1, 2001 and March 31, 2003, a total of 393 patients (1-15 years old) sought advice; 67.7% came for a visit and examination after telephone consultation (visited patients) and 32.3% received telephone advice, but did not need to come for a medical visit (non-visited patients). The busiest consulting time for both groups was the evening time band. Soft tissue injuries were the most frequent in both visited and non-visited patients, 66.9 and 85.0% respectively. Particularly in non-visited patients, the upper lip was the most significantly affected site (57.4%). The most common cause of injuries was falls (84.2% of visited and 77.2% of non-visited patients). Of non-visited patients, the most common reason not to visit was a minor injury that did not require examination (87.4%). We recommend that a personal telephone call from a dentist is important because telephone consultation can help triage patients and provide relief for the patient's guardians.

Oral injuries in children, after-hours in the evening and/or night, frequently occur (1-3). There have been several statistical reports that showed the characteristics of oral injuries of children who visited the emergency or after-hours clinic (4, 5). In this study, we initially planned to present a statistical study of oral injuries in Japanese children who visited the after-hours clinic in the evening and night. However, we noticed that while there were children who visited the hospital for injuries there were also a considerable number of children who did not visit the hospital although their guardians had telephoned us for medical advice. We decided that it was necessary to include not only the children who visited the clinic, but also those who did not visit but rather were managed with a telephone call, for the discussion of the trend of oral injuries in children during the evening and night hours.

Norio Horie, Tetsuo Shimoyama, Kiyoe Hasegawa, Takahiro Kaneko

Department of Oral Surgery, Saitama Medical Center, Saitama Medical School, Saitama, Japan

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Dr Norio Horie DDS PhD, Department of Oral Surgery, Saitama Medical Center, Saitama Medical School, 1981 Kamoda, Kawagoe, Saitama 350-8550, Japan Tel.: 049 228 3687 Fax: 049 225 1667 e-mail: horien@saitama-med.ac.jp

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Saitama Medical Center is situated in Kawagoe, a city with a population of 331 800, located northwest of Tokyo approximately 40 min by train. It is an old castle town with fertile farmland that has become a commuter town for the metropolitan area. Kawagoe is a typical city, neither strictly urban nor rural, and it is ideal for a statistical study of children. Saitama Medical Center offers emergency medical care and after-hours clinics. The clinics are opened 7 days a week for evening and night hours, and daytime hours during holidays in all clinics (except for psychology clinic). The oral surgery clinic also services patients for dental and oral surgery problems. The patients who want to visit are required to call before visiting. Telephone calls are connected to a clinic doctor for consultation, and he or she subsequently decides whether or not the patients need to come in for examination.

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Naturally, there are cases resolved with phone advice that do not require an actual visit. A telephone consultation helps triage of patients that need to be seen so it more efficient and may even provide some costs savings.

In order to provide a more complete picture of after-hours pediatric oral injuries, this study included injured patients who actually visited and were examined and patients who did not require a visit but were managed with telephone advice.

Material and methods

From April 1, 2001 to March 31, 2003, at the afterhours oral surgery clinic of Saitama Medical Center, 393 children (1-15 years of age) received medical advice for oral and dental injuries during the evening and night shift. The patients were divided in two groups, those who actually visited our clinic for an examination (visited patients) and those who received advice on the telephone, but did not visit actually (non-visited patients). The decision of visiting or no visiting was done by the telephone consultation with the patient's guardians. In each case; sex, age, a consulting time band, classification, and cause of injury were recorded. In the case of non-visited patients the reason for no visit was also recorded. The consulting time period for patients making a telephone call was divided in two bands, an evening time band (17:30~23:30) and a nighttime band $(23:30 \sim 08:30)$, according to our rotating shift schedules. The evening time band was subdivided, every 3 h, into an early band $(17:30 \sim 20:30)$ and a late band $(20:30 \sim 23:30)$. The nighttime band also subdivided into an early band was (23:30~02:30), a middle band (02:30~05:30) and a late band (05:30~08:30). Injuries visited patients were classified into four categories: soft tissue injury, tooth injury, bruising and fracture. Soft tissue injuries were subclassified according to location. In cases of non-visited patients injuries were likewise classified according to the self-reported data by the guardians. The classification of injuries was mutually exclusive. If more than one type of injury occurred, the injury was classified according to the most serious damage. Statistical calculations were performed using chi-square tests within Microsoft ExcelTM.

Results

Of the 393 children, 266 (67.7%) were visited patients and 127 (32.3%) were non-visited patients (Fig. 1). The visited patients included 185 (69.5%) males and 81 (30.5%) females and non-visited patients included 87 (68.5%) males and 40 (31.5%) females. The ratio of male to female in visited



Fig. 1. Age distribution of visited patients.

patients and non-visited patients was 2.1:1 and 2.2:1 respectively. In visited patients the highest occurrence of injury was among 1-year olds (32.0%), followed by 2-year olds (16.5%) and 3-year olds (12.8%) (Fig. 1). Among non-visited patients, 1-year olds also had the most frequent injuries (33.9%), followed by 2-year olds (16.5%) and 3-year olds (13.4%) (Fig. 2). There was no significant difference between the age distribution of visited patients and that of non-visited patients. The busiest consulting time band of the visited patients was the evening time band (88.4%), in which the early band comprised 45.9% and the late band comprised 42.5%. In the nighttime band the number of patients decreased as dawn approached. In nonvisited patients, most (81.1%) were advised in the evening time band. The early band and late band were 36.2 and 44.9%, respectively. In the nighttime band, the number of patients was also limited, especially in the middle and late bands (Fig. 3). In a distribution of consulting time bands there were no significant differences between visited patients and non-visited patients. In visited patients, soft tissue injuries (178; 66.9%) were most frequent, followed by tooth injuries (70; 26.3%). Bruising 12 (4.52%) and fractures six (2.3%) were less common. For nonvisited patients there were 108 (85.0%) soft tissue injuries, 12 (9.4%) tooth injuries, seven (5.5%) bruises, and 0 (0%) fractures (Fig. 4). Soft tissue injuries were significantly more common in nonvisited patients than in visited patients (P < 0.001). On closer examination of soft tissue injuries in the



Fig. 2. Age distribution of non-visited patients.



Fig. 3. Distribution of consulting time band.

Fig. 4. Types of injuries.

visited patients, 56 (31.5%) involved the upper lip, followed by 28 (15.7%) multiple sites and 27 (15.2%) lower lip injuries. In the case of non-visited patients, 62(57.4%) were injuries of the upper lip, 16(14.8%)of the tongue, and nine (8.3%) of the gingiva (Fig. 5). Injuries of the upper lip were significantly more common in non-visited patients than in visited patients (P < 0.001). The most frequent cause of injuries for visited patients was falls (224; 84.2%), followed by 34 (12.8%) collisions (Fig. 6). For injuries in non-visited patients falls were also more common (98; 77.2%), followed by 29 (22.8%) collisions (Fig. 7). The occurrence of falls was significantly high in both visited and non-visited patients (P < 0.001). Of non-visited patients, the most common reason for not visiting was minor injury that did not require examination (111; 87.4%) followed by a referral to another hospital (16; 12.6%) (Fig. 8).

Discussion

To our knowledge there are no previous reports of oral injuries, which compare the patients who went in for a visit and examination with those who did not visit, after seeking advice by telephone. A total of 393 children sustained oral and dental injuries. After guardians consulted us by telephone in the evening and night, 67.7% of the children were taken in for an examination and 32.3% were managed with telephone advice only. We found that one-third of patients did not require a visit although they had injuries. The male to female ratio of visited and nonvisited patients showed male predominance and this result was similar to previous reports that boys were more commonly affected than girls (6–9).

The most common age for an injury in visited patients was 1 year (32.0%) and 68.1% of the patients were under 3 years old. O'Neil et al. (8) reported that infants from 1 to 2 years old had the most oral trauma and 79.7% were from 1 to 8 years old. Shaikh et al. (6) described facial trauma in children from 0 to 1 years old (65.5%) and Hussain et al. (4) revealed that the peak incidence of all childhood craniofacial injuries occurred between 2 and 4 years of age. Consistently, infants and younger children tended to have more oral injuries than older children. These results were similar to overall injury patterns of children and coincide with developmental achievements such as independent mobility (10). In the case of non-visited patients, children up to 3 years old were also more frequently



Fig. 5. Types of soft tissue injuries.





Fig. 6. Cause of injuries of visited patients.



Fig. 7. Cause of injuries of non-visited patients.



Fig. 8. Reason for not visiting of non-visited patients.

involved (71.7%), especially 1-year olds (33.9%). There was no significant difference between the age distribution of visited patients and of non-visited patients.

The evening time band had the highest number of consultations. The patients needing consultation during the nighttime band were fewer, especially approaching dawn. In the non-visited patients, the evening time band was also the most common time band. There was no significant difference of the distribution between visited patients and non-visited patients. Generally, almost no trauma was detected in children during the night (11). Shinya et al. (12) showed in their study of facial injuries associated with falling that few children went in for examination after 24:00 hours. Logically, most children are sleeping; they have no any chance to encounter injuries during the night. Petersson et al. (2) mentioned that the number of oral injuries was higher in the late evening compared with non-oral injuries, but in our study there was no statistical significance within the evening time band.

The most common injury in patients who visited was soft tissue injury (66.9%) followed by tooth injury (26.2%). Most injuries were relatively minor and bruises and fractures were extremely rare. Similar results were found in other studies (5, 6, 8). In the case of serious injuries, the guardians might have taken the injured children directly to the emergency medical center rather than delaying to phone for advice (13). In non-visited patients the most frequent injuries were also soft tissue injuries (85.0%), followed by tooth injuries (9.4%). More serious injuries like fractures were not found. For non-visited patients, soft tissue injuries were significantly higher compared with visited patients.

In the soft tissue injuries of visited patients, the upper lip was the most frequent site (31.5%). Several studies described that the upper lip was the most frequent site of injury (3, 6). O'Neil et al. (8) described that laceration of the lip was the most predominant injury to the structure of the oral cavity, accounting for 62.8% of oral trauma. In the non-visited patients, the upper lip was also a higher affected site (57.4%) and there were significantly more upper lip injuries in non-visited patients than in visited patients (P < 0.001).

Falls were the cause of most injuries for both visited (84.2%) and non-visited patients (77.2%). These results are similar to other studies (2, 7-9, 12). Hutchison et al. (7) described that falls were the major cause of oral injuries of preschool age children. Shaikh et al. (6) suggested several factors for the higher incidence of falling. (i) With decreasing age, immaturity in development of motion and balance increases. (ii) Awareness of facial appearance and its social importance increases with age. During a fall, older children and adolescents may be more likely to attempt shielding their face. (iii) Young children are less aware of danger and, therefore, are much less cautious in their actions. The ratio of falls in our study might be artificially high compared with other reports (7, 8, 12). A possible explanation for this variance was that there were cases of serious injuries or accidents not related to falls that were taken directly to the emergency medical center for examination. These cases were not included in this study. In addition during the evening and night when the children were inside the home there was less chance to encounter sports or traffic related accidents. Likewise, children in our sample were less likely to be involved in assaults compared with high school students, over the age of 16 (7). In fact, most falls were reported to occur in the home (7); 78.5% of oral injuries for 1 and 2-year olds occurred in the home (5).

The most common reason for patients not to visit was that there was no need because the injuries were minor and the process of self-examination and selfcare was preferable and adequate. In other cases, another hospital near by was suggested as an alternative if it was difficult for the caller and patient to travel to our hospital.

From this study, we understood there were many patients who did not go in for examination despite complaints of injuries. Even those in the visited group sustained injuries that were relatively minor; upper lip injuries were especially common.

We recommend that a personal telephone call from a dentist is important. Generally in Japan, the physician has limited knowledge about teeth and oral lesions. It is even less preferable for nursing staff, without dental and oral surgery training, to advise the patients. Inevitably, a dentist is the most qualified healthcare professional to accurately diagnosis these oral injuries. The advantage is that guardians and patients are adequately advised about the immediate necessity to seek after-hours care. Otherwise they frequently and inappropriately undertake a long drive and meaningless visit to the hospital for a case of minor injury. In addition, telephone consultation contributes to cost-containment. Expensive after-hours resources are conserved and provider time is allocated towards the most serious injuries. Secondarily, patients' guardians feel relieved after talking with a dentist and tend to follow the dentist's instructions more faithfully than if advised by other members of the medical staff.

As to the high occurrences of injuries among children, it is important to educate guardians that children have injuries inside the home rather than outside in the evening and night hours (7), and upper lip injuries related to falls in infants and young children, are the most common form of oral trauma.

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