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Clinical characteristics of dental emergencies and prevalence of dental trauma at a university hospital emergency center in Korea

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Abstract – *Aim:* The aim of this study was to examine the clinical characteristics of dental emergency patients who visited a university hospital emergency center and to evaluate the incidence of dental trauma. Materials and methods: A retrospective chart review of patients with dental complaints and who visited the Seoul National University Bundang Hospital (SNUBH) emergency center in Gyeonggi-do, Korea, from January 2009 to December 2009 was conducted. Information regarding age, gender, the time, day, and month of presentation, diagnosis, treatment, and follow up was collected and analyzed. Results: One thousand four hundred twenty-five patients with dental problems visited the SNUBH emergency center. Dental patients accounted for 1.47% of the total 96 708 patients at the emergency center. The male-to-female ratio was 1.68:1, with a considerably larger number of male patients (62.7%). The age distribution peak was at 0-9 years (27.5%), followed by patients in their forties (14.1%). The number of patients visiting the dental emergency center peaked in May (14.2%), on Sundays (22.4%), and between 2100 and 2400 h (20.8%). The patients' chief complaints were as follows: dental trauma, dental infection, oral bleeding, and temporomandibular joint disorder (TMD). The prevalence of dental trauma was 66%. Conclusions: The reasons for dental emergency visits included the following: dental trauma, dental infection, oral bleeding, and TMD, with 66% of the patients requiring management of dental trauma. It is important that dentists make a prompt, accurate diagnosis and initiate effective treatment in case of dental emergencies, especially dental trauma.

An emergency patient is defined as one with an urgent condition because of disease, injury, accident, or disaster, who needs immediate treatment (1). Earlier research has indicated that nighttime emergency visits by patients with maxillofacial injury, dental trauma, and dental infection have markedly increased (2, 3). The oral and maxillofacial region is structured with a dense network of sensory and motor nerves associated with pain. When excessive acute pain results from an accident or infection in this area, the patient experiences severe physical and emotional stress (3).

The Seoul National University Bundang Hospital (SNUBH) has an emergency center that functions as 1 of the 100 local emergency medical centers designated by the Korean law for Emergency Medical Treatment (1). Most dental emergency patients are admitted to the SNUBH emergency center, because it is the only 24-h dental emergency patient enters the hospital, a medical intern addresses the patient's problem. In case of problems involving the oral and maxillofacial area, an on-duty dentist is generally on night duty. For urgent, complex cases requiring a specialist, an on-call duty

professor of the oral and maxillofacial surgery department is summoned.

Interns are in charge of nighttime dental emergencies in most hospitals, and they manage simple cases quite easily. However, in those critical emergency cases related to a medical concern, delivery of a prompt and precise treatment is challenging for interns with little experience (4, 5). To administer an error-free first-aid treatment in case of an emergency, an involved practitioner must have knowledge about the clinical characteristics of that emergency condition and the appropriate treatment to be administered.

The purpose of this study was to examine the clinical characteristics of the dental emergency patients who visited the SUNBH emergency center and evaluate the incidence of dental trauma. The information will be used for determining the real state of dental emergencies and thus aid review of the significance of dental traumatic treatment and enhance treatment of future emergency patients.

Materials and methods

A retrospective chart review of the patients with dental complaints who visited the SNUBH emergency center in Gyeonggi-do, Korea, from January 2009 to December 2009, was conducted.

This study was approved by Institutional Review Board of SNUBH (IRB no.: B-1005-100-104).

Data regarding age, gender, the time, day, and month of presentation, the diagnosis made at examination by the on-duty dentist, treatment, and follow up were collected and analyzed from the electronic medical record based on the dental emergency chart. The dental emergency diagnosis was divided into four chief categories as follows, according to the classification described by previous studies (2, 3): dental trauma, dental infection, oral bleeding, and temporomandibular joint disorder (TMD).

Statistical analysis was carried out using descriptive statistics (frequency distribution) and Pearson's chisquare test, with the significance level set as P < 0.05using Statistical Package for Social Sciences (SPSS) software (Version 17.0; SPSS Inc., Chicago, IL, USA).

Results

From January 2009 to December 2009, 1425 patients with dental problems visited the SNUBH emergency center. Dental patients accounted for 1.47% of the total 96 708 patients at the emergency center. The age of the patients was between 10 months and 92 years. The age distribution peak was at 0–9 years (27.5%), followed by patients in their forties (14.1%). The number of male patients (62.7%) was significantly higher than that of female patients (37.3%), compared to the total Seongnam population (P < 0.01). The male-to-female ratio was 1.68:1 (Fig. 1).

The number of visits of patients with dental emergency patient peaked in May (14.2%), and most dental emergency patients visited between May and August (June, 11.8%; July, 9.5%; August, 10.2%) (Fig. 2). Sunday (22.4%) was the busiest day, and 38% of the patients visited on weekends (Fig. 3). The peak time of dental emergency visits was between 2100 and 2400 h (20.8%) (Fig. 4).



Fig. 1. Distribution of patients with dental problems who visited the emergency center in relation to age and gender. The first column of each age group shows data for male patients, whereas the second column shows those for female patients.



Fig. 2. Distribution of patients with dental problems who visited the emergency center in relation to time of the year.



Fig. 3. Distribution of patients with dental problems who visited the emergency center in relation to day of the week.



Fig. 4. Distribution of patients with dental problems who visited the emergency center in relation to time.

Dental trauma (66.0%) was the main reason for emergency visits, followed by dental infection (19.4%), oral bleeding (6.3%), TMD (3.6%), and other problems, such as failure of dental prostheses and orthodontic displacement (4.8%) (Fig. 1).

The major treatment for trauma was suturing, followed by splinting, whereas that for infection was medication, followed by incision and drainage. The treatment for bleeding was pressure dressing, followed by surgical packing, whereas that for TMD was medication, followed by reduction (Fig. 5).

After emergency treatment, majority of patients were referred to local dental clinics (59.4%). About 21.9% of patients were scheduled for the next appointment at the dental department of the SNUBH. Some patients were classified as 'end of treatment' (6.5%), and some patients were scheduled for a re-visit in case of recurring symptoms (6.3%). Patients with medical problem were referred to other departments of the SNUBH (2.9%). About 1.5% of patients were hospitalized in the SNUBH dental department.

Discussion

In agreement with the results of previous studies (6, 7), more men were likely to visit dental emergency centers than were women in this study. The male-to-female ratio reflects differences in social and conventional activities (8, 9). A larger number of men presented to the emergency center with dental trauma. Men are more aggressive, energetic, inclined toward vigorous outdoor activities, and exposed to violent accidents than are women (10).

This study showed that a surprisingly large number of patients under 10 years of age visited the dental emergency center; this finding confirmed the results of previous studies (7, 11–13). The main reason for these

visits was dental trauma. Children are prone to dental trauma because they are active, independent, curious, and exploratory, yet lacking in sufficient motor coordination and judgment (12, 13). Most dental infections occurred among patients in twenties-thirties regardless of gender. Oral Bleeding occurred chiefly in twenties-sixties, while TMD occurred in twenties.

Peak visits to the emergency center occurred between May and August, on Sundays, and between 2100 and 2400 h. The seasonal variation in this study was similar to that of other studies, reporting that emergency visits increased in warm weather and during vacations (6, 11, 12). In this study, the occurrence of other diseases, such as dental infection, oral bleeding, and TMD, in those periods was not different from those of other seasons, but the incidence of dental trauma in those periods increased. More dental traumas occurred between May and August, when people are more inclined to participate in outdoor activities (12).

Regarding the time and weekly variation, there were more visits on Sundays and between 2100 and 2400 h, when other dental clinics were closed, confirming the data of previous studies (2, 3, 14, 15). Owing to the fact that the SNUBH emergency center is the only 24-h dental emergency facility in the Seongnam area, patients were unable to access other nearby emergency dental services. The dental emergency center fills a gap in the services provided by private local dental clinics, which are closed on weekends and at night (8).

Dental trauma was the most common reason for patients' visits to the emergency center in this study (66%), which is similar to the findings of other studies in Korea (from 70.9 to 71.6%) (2, 3). This percentage was greater than the results of previous studies in the USA, where the prevalence was from 13.1 to 26.6% (7, 13, 14). The prevalence of dental trauma in dental emergency



Fig. 5. Treatment for patients with a dental emergency.

was 27.7% in the United Kingdom (15), 11% in Greece (6), and 8.4% in France (8). Unlike in the USA and other countries (7–14), basic dental treatments such as extraction, amalgam and glass ionomer restoration, endodontic treatment, and periodontal treatment are covered by the government through the national public health insurance system in Korea. Caries and periodontal disease are treatable at nearby dental clinics with a prompt appointment at low cost. When using the emergency center, patients must pay additional costs for emergency treatment, so patients only visited the emergency center with urgent problems. Owing to these reasons, 3.5 times more patients visited the emergency center with dental trauma than with dental infections in this study.

The main reasons for dental emergency visits were dental infection and toothache in other countries (6-8, 13, 15). Abscess and cellulitis (26.7%) and pain caused by caries (30.1%) were the main reasons in the studies of the USA (7, 13). These results were because of the fact that the emergency department is an important point of care for dental complaints, especially for poor and uninsured patients (7, 14), and a well-known point of entry into the health care system for persons with difficulty in accessing routine preventative services in the USA and Canada (14, 16). With regard to emergency visits in Greece, 42% of the patients presented with gingival swelling, 35% with toothache caused by pulpitis, and 7% with diffuse cellulitis (6), while from 52.3 to 72%of the patients in the United Kingdom presented with toothache in the form of acute pulpitis or periapical periodontitis (15, 17, 18). In France, acute pain (74.4%) was the most common complaint for seeking emergency care, because the treatment of dental disease has the lowest welfare refund rate provided by the French public health insurance system (8). Owing to the limited data collected, comparison with international data must be performed with caution. There should be further studies about the real state of dental emergencies of more countries.

In this study, patients' failure to follow postoperative or postextraction instructions of local dental clinics was the etiology of most emergency oral bleeding. In majority of these cases, applications of pressure dressing or gauze biting resolved the problem. Severe cases required surgical packing or suturing.

Most TMDs were caused by post-traumatic masticatory myofascial pain syndrome and responded to the administration of sedatives and pain killers, with a follow-up appointment to the dental department. Displaced temporomandibular joints were manually reduced in the emergency center.

After emergency treatment, the majority of patients were referred to local dental clinics (59.4%), as there were only 18 dentists in the SNUBH dental department. A staff of this size is not capable of performing the necessary follow-up treatment of emergency patients, except for those patients who especially requested to be treated in the SNUBH dental department (21.9%). Those patients with maxillofacial bone fracture or cellulitis were hospitalized in the SNUBH dental department (1.5%), whereas those with medical problem were

referred to other departments of the SNUBH, such as the departments of plastic surgery and otorhinolaryngology (2.9%).

In conclusion, 66% of the patients visited the SNUBH dental emergency center because of dental trauma, followed by dental infection, oral bleeding, and TMD. The conditions of those patients visiting a hospital emergency center and presenting with acute dental symptoms or trauma must be managed efficaciously through prompt, accurate diagnoses and initiation of an effective treatment. There is a need for an educational program specifically for emergency center providers and dentists. They need to be informed about the triage, diagnose, treatment, and follow-up care for emergency dental problems.

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