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Role of Topical Anesthetics Versus Topical Steroids in The Management of Traumatic Ulcer: A Case Control Study

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ABSTRACT

Traumatic ulcers represent one of the most common types of ulcers occurring in the oral cavity. The etiology for the causation of the traumatic ulcers might be due to mechanical trauma-which is the commonest, thermal and electrical trauma. The ulcers due to trauma are well circumscribed, most often deep with sloping margins and an erythematous halo around the ulcers. The management of traumatic ulcers usually ranges from the prescription of topical anesthetics, steroids to nutritional supplements.The aim of this study was to assess the prevalence of traumatic ulcers and to analyse the frequency of prescription of topical anesthetics and topical steroids in the management of traumatic ulcers.The study sample consisted of 94 patients with traumatic ulcer.The patients with traumatic ulcers included 56 males with a predominance of cases in the 3rd to 4th decade of life. The number of patients who were treated with topical anesthetics is 68 and topical corticosteroids are only 9. A combination of topical steroids and local anesthetics were used in 17 patients. The results reveal that the single most common drug used in the management of traumatic ulcer is the prescription of topical anesthetics. The second most common agent used is corticosteroids. On analysing the results based on the age group to the type of therapy, there was no significance (P>0.05). The use of topical anesthetics is the commonest in the management of oral traumatic ulcers.

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INTRODUCTION

Oral ulceration is a common complaint among patients attending out-patient clinics. Oral ulcers occur due to a variety of causes. It is essential to triage and segregate harmless ulcers from harmful malignant ulcers (Leão *et al.*, 2007). In a country like India, where there is a high use of tobacco products, it is essential to identify ulcers with features of malignancy during the early stages of presentation (Warnakulasuriya and Muthukrishnan, 2018). Nevertheless, the presence of oral ulcers which do not heal in 10-14 days should attract the attention of the oral physician. If necessary, an invasive biopsy

needs to be performed to identify the real cause of ulceration (Steele *et al.*, 2015). Oral ulcers are a very common disorder of the oral mucosa. Several predisposing factors have been suggested and oral ulcers can be a feature of various systemic disorders including inflammatory bowel disease. The nature, size, duration and frequency of oral ulcers are determined by the underlying systemic condition (Porter and Leao, 2005).

Ulceration is a breach in the epithelium of the oral cavity, which typically exposes the nerve endings in the underlying lamina propria, resulting in pain or soreness, especially when consuming spicy foods or citrus fruits. The subjective impact of the ulcers on the patients vary enormously from the mild, tolerable degree of soreness to severe pain, having an impact on the quality of life (Mortazavi *et al.*, 2016). There have been long-standing oral ulcerations as a sequel to metastasis from distant organs and have went unnoticed by the patients for long (Misra *et al.*, 2015).

The ulcerations of the oral mucosa are caused by epithelial defects, connective tissue defects or both. Due to the diversity of causative factors and presenting features, diagnosis of oral ulcerative lesions might be quite challenging. The injuries may result from events such as accidentally biting oneself during the speech, during sleep or secondary to mastication. Apart from this, they may be associated with mechanical, electrical, chemical or thermal trauma. It may also be involved in addition to, fractured, malformed teeth, malposed, or caries. Physical traumatic ulcers are more common in the oral cavity. The physical traumatic ulcers may be caused by a sharp tooth, sharp margins of restorations, fractured restoration, orthodontic appliance, sharp margins of dentures or factitial. Appears as a yellow base with erythematous borders & heals in 7 - 14 days if the cause is removed (Babu *et al.*, 2017). The ulcers in the oral cavity have also been seen in patients with poor oral hygiene (Subashri and Maheshwari, 2016) and also with increased incidence of dental caries and other odontogenic diseases (Rohini and Kumar, 2017). Poorly maintained and ill-fitting dental prosthetics can also cause trauma. Most injuries to the oral mucosa are painful and are a common reason for patients to choose self-treatment or approach a dentist. The nosological origins of such wounds are multiple, including inflammation, mechanical injury, or tumor-associated (Porter and Leao, 2005).

The aim of this study was to assess the prevalence of traumatic ulcers and to analyse the frequency of prescription of topical anesthetics and topical steroids in the management of traumatic ulcers.

MATERIALS AND METHODS

The archived patient records of the Department of Oral Medicine and Radiology, Saveetha Dental College were collected and the data was assessed from the time period of June 2019 - April 2020. From the record of 86000 cases, all known cases of traumatic ulcer were picked up. Ethical clearance was obtained from the Institutional Ethics Committee of Saveetha Dental College. The Cross-checking of data, including digital entry and intraoral photographs, was done by an additional reviewer. The main advantages of this study were that the data was all prevalidated and the main disadvantages were that it was a unicentric study and only a single ethnicity of the population was studied.

The selected samples were examined by three people; 1 reviewer, 1 guide and 1 researcher The patient data were picked up from the case sheets and the variables recorded were the age, gender, tobacco usage type and the site of the lesion. The data was randomly cross-verified by either recalling the patients and having telephonic conversations with the patient.

The internal validity of the study was established as the data was collected from a verifiable and standardised database. The external validity is established as the data is from a clinical setup which is duplicatable.

A pretested format was used to record the data. Data analysis was done using SPSS PC Version 23.0(IBM;2016) software for statistics. Both independent and dependent variables were recorded and analysed. The final statistical analysis included means to find out if there was significant usage of a particular drug in the management of traumatic ulcer using Chi-square test and level of significance at 0.05 level.

RESULTS AND DISCUSSION

On analysis of the collected data, it was found that there were 94 patients who had reported with traumatic ulcers during the time period of June 2019 to March 2020. The age of the patients ranged from 18-84 years, with a mean age of 38.04 years. The bar graph of the age plotting of the patients reveals that the majority of patients were in the 3rd to 6th decade of life. After the age of 60, there were far fewer cases reported. This, in turn, implies that the vast majority of cases are reported in the middle ages of life. Figure 1 The gender distribution of the patients reveals that 56(59.6%) of the

patients were males and 38(40.4%) of the patients were females. X axis gives the age group of the patients and Y axis gives the count. The majority of the patients were in the 31-60 years age group. Figure 2 This again reiterates the fact, in general, there is a decrease in the prevalence of ulcers in females. 59.57%(56) patients were from the male gender and 40.43 %(38) patients from the female gender. The results showed that, in this study, it was observed that topical anaesthetics were prescribed more frequently for traumatic ulcer (73%) among the study population and corticosteroids were prescribed least among the study population. The number of patients who were treated with topical anesthetics is 68 and topical corticosteroids are only 9. A combination of topical steroids and local anesthetics were used in 17 patients. Figure 3 A composite graph was drawn to analyse the drug usage either single or in combination across the genders. X axis gives the type of therapy and Y axis gives the percentage of cases. The great majority of patients were treated with topical anesthetic. The graph shows that topical anesthetic as a solitary drug was the predominant drug of choice in both the genders. In general, there was a decrease in the usage of corticosteroids in females compared to males. The combination of the usage of both drugs was of a small proportion and was equally distributed across both the genders. There was no statistical significance. (P>0.05) Figure 4 On analysing the results based on the age group to the type of therapy, there was no significance (P>0.05). X axis represents the type of therapy and Y axis represents the percentage of cases with male (blue) and female (green). Majority of males were prescribed topical anesthetic for treating traumatic ulcers. A chi-square analysis was done between the gender and type of therapy which was found to be chi-square value 1.544, df-2, p-0.46(p>0.05) which implies there is no significant association between the gender and type of therapy.

Oral traumatic ulcers are one of the most common types of oral ulcers and are divided into acute and chronic varieties Figure 5. X axis represents the type of therapy and Y axis represent the percentage of cases, Majority of patients of different age group were treated with topical anesthetic. A chi-square analysis was done between the age and type of therapy with chi-square value 5.947, df-4, p-0.203(p>0.05) which implies there is no statistical significance association between the age and type of therapy. Clinical presentation of traumatic lesions varies significantly and the cause and the effect can usually be established by thorough case history compilation and clinical examination (Kvam *et al.*, 1987). Patients with traumatic ulcers also

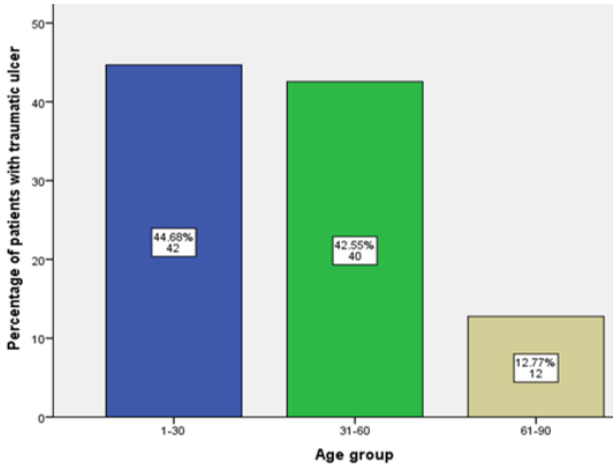

Figure 1: Graph showing age distribution of the patients

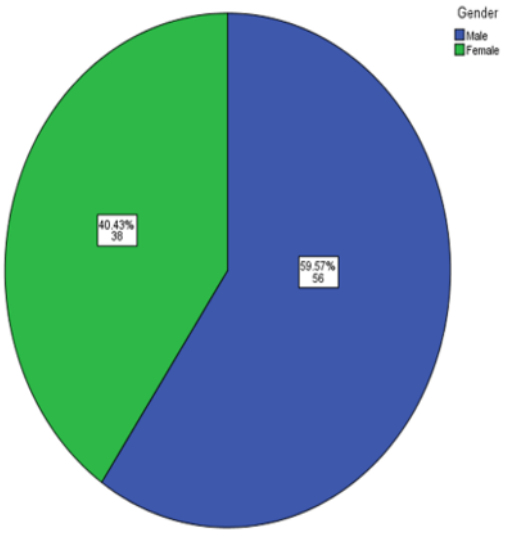

Figure 2: Pie chart showing the distribution of cases across the genders

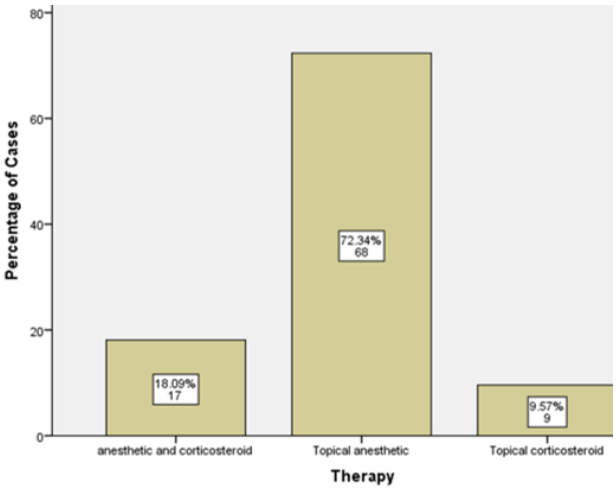

Figure 3: Bar chart showing the usage of drugs in the management of traumatic ulcers

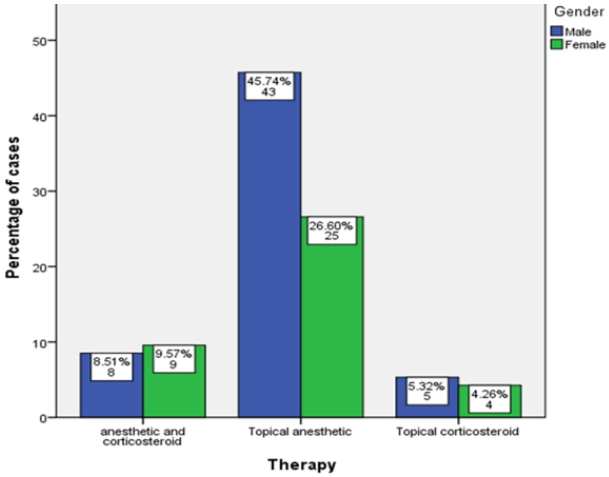

Figure 4: A clustered bar graph showing the relation between the type of therapy and the gender

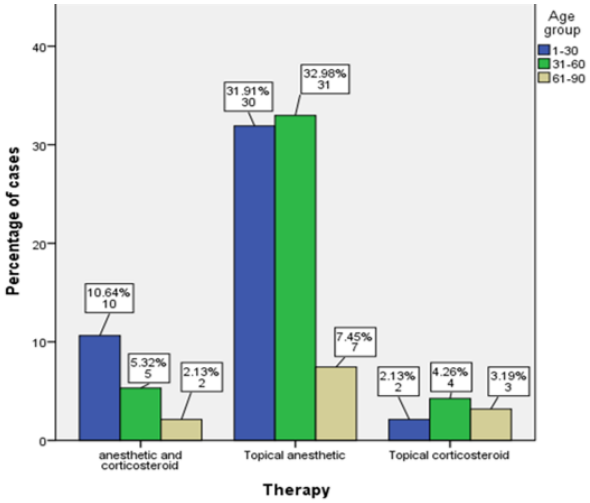

Figure 5: A clustered bar graph showing the relation between age group and the type of therapy used

exhibit changes in the salivary micro RNA content, which is consistent with the fact that there is an elevation of inflammatory mediators in the saliva (Maheswari *et al.*, 2018). The tissue analysis also shows that there is an elevation of matrix metalloproteinase levels in the saliva (Venugopal and Maheswari, 2016). Patients with traumatic ulcer also may have other granulomatous lesions elsewhere in the oral cavity and hence a thorough oral examination is mandated (Hirshberg *et al.*, 2006). Incidentally, there is a type of traumatic ulcer which typically is seen in the ventral surface of the tongue and is referred to as riga-fede-disease (Slayton, 2000).

The management of traumatic ulcers is purely supportive of prescribing topical anesthetics to relieve the patient of the pain and symptoms (Muthukrishnan *et al.*, 2016).

There is a spectrum of topical anti-inflammatory agents in the form of corticosteroids that may help in the management of traumatic oral ulcers. The common preparations used in the management of traumatic ulcers consist of the administration of topical hydrocortisone which is a low potency steroid. For recalcitrant cases, high potency steroids like betamethasone are given in a base of carboxymethyl cellulose base(Orabase.) The major concern with steroid use is adrenal suppression with long-term and/or repeated application, but the risk with the lower potency of steroids is low. The most common steroid used in the management of traumatic ulcer is triamcinolone in Orabase 0.1% is often advocated for use on oral ulcers (Steele *et al.*, 2015; Warnakulasuriya and Muthukrishnan, 2018). However, there has been a concern raised from the patient's side that the application of this preparation leaves behind a bad taste in the mouth. There are also reports to show that the patients do not like the sensation or taste of ointments and cream and some patients may have difficulty in applying these oil-based preparations on a moist mucosal surface. Before the application of these topical agents, the mucosal surfaces must be dried to allow better penetration of the drug into the mucosa (Kvam *et al.*, 1987). Topical steroids are used in the management of several conditions of immune nature (Dharman and Muthukrishnan, 2016; Muthukrishnan and Kumar, 2017).

Apart from the aforementioned medications, supportive medications in the form vitamin C and B complex has also been advised. It has been proposed that the usage of vitamin C improves the overall mucosal health and well being of the individual (Chaitanya, 2017). Recent studies have pointed out that Vitamin C has mild analgesic effects too, which can be beneficial in the management of traumatic ulcer (Chaitanya *et al.*, 2018).

A study showed that in cases of traumatic ulcer the main mode of treatment was to remove the etiological factor as in their study all the patients of traumatic ulcer were due to a sharp tooth or denture margins. After removal of the etiological factor, the patients were subjected to the topical application of anesthetic agents (Apriasari, 2012). Our study results also show that the traumatic ulcers were predominantly prescribed topical anesthetics.

Another study also found that topical anesthetics were the predominant drug of choice in the management of traumatic ulcer (Choudhury, 2015; Nelonda and Setiadhi, 2018).

Our study results are in line with the available existing literature. Further, the use of topical steroids has

to be limited in the management of traumatic ulcers as in case if it is an ulcer with dysplastic features it may lead to the development of full blown malignancy

Limitations include data may have discrepancies and are limited to one geographic area. But there have been several studies done in the past from the same database which has given highly significant results (Patil *et al.*, 2018; Subha and Arvind, 2019).

The future scope of this study would be to do a larger sample size pertaining to traumatic ulcers and not restricted to a single centre. The future studies should also include the patient response in terms of the number of days taken for the lesion to heal completely and the intensity of pain as scored on a visual analogue scale or similar such scales.

CONCLUSION

Within the limitations of the study, we find that topical anesthetics are the most common drugs used for the management of traumatic ulcers. Traumatic ulcers represent one of the most common causes of oral ulcers and it is found that the management of these ulcers as evident from the literature would be to remove the etiological causative factor which has to be primarily addressed.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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