

Received: May 2022

Accepted: June 2022

TREATMENT OF ORAL LESIONS AS SIDE EFFECTS AFTER ADMINISTRATION OF ERYTHRITOL POWDER CONTAINING 0,3% CHLORHEXIDINE AND 0,2% CHLORHEXIDINE DIGLUCONATE ORAL ANTISEPTIC: CASE REPORT

Enes Pašić¹, Sanja Hadžić¹, Mirjana Gojkov-Vukelić¹,
Zerina Hadžić*²

¹ Department of Oral Medicine and Periodontology, Faculty of Dentistry, University of Sarajevo, Bolnicka 4A, 71000 Sarajevo, Bosnia and Herzegovina

² Department of Dentistry, Sarajevo School of Science and Technology, Hrasnička cesta 3a, 71000 Sarajevo, Bosnia and Herzegovina

*Corresponding author

Zerina Hadžić
Department of Dentistry
Sarajevo School of Science
and Technology,
Hrasnička cesta 3a
71 000 Sarajevo,
Bosnia and Herzegovina
Phone: +387 61739844
e-mail: smajic.zerina@gmail.com

ABSTRACT

Objective: The aim of this case report was to document a case of side effect reaction of the gingiva and oral mucosa after the use of Erythritol powder containing 0.3% chlorhexidine (Air Flow® Powder PLUS) and 0,2 % chlorhexidine digluconate oral antiseptic solution.

Case report: A 49-year-old female patient presented with severe erosive and suspected necrotic changes on lips and gums, upper lip swelling and severe pain which was present for 15 days. Previously, chlorhexidine digluconate 0,2 % was used in treatments with diode laser following the prophylaxis treatment which included the use of Erythritol powder containing 0.3% chlorhexidine. The patient was prescribed and successfully treated with a combination of antibiotics: Amoxicillin (a 500 mg) and Metronidazole (a 250 mg), Lysobact oriblets (6-8 a day), Panthenol solution for rinsing (3 times a day), and a magistral medicine with Pronisone for local application.

Conclusion: Due to the proven possible side effects of Erythritol powder containing 0.3% chlorhexidine and 0,2 % chlorhexidine digluconate, uncritical use of Erythritol powder containing 0.3% chlorhexidine and chlorhexidine digluconate should be avoided. The therapy applied in the presented case proved to be extremely effective in the treatment of changes that occurred as a side effect of the use of Erythritol powder containing 0.3% chlorhexidine and 0,2% chlorhexidine digluconate.

Keywords: erosive stomatitis, chlorhexidine, Erythritol, side effect, oral mucosa.

Introduction

Erosive stomatitis is a complex disease of the oral mucosa clinically presented with hyperemia, swelling, bleeding and erosive forms. This type of inflammation of the mucous lining may involve the cheeks, gums, tongue, lips and roof or floor of the mouth. The condition is painful and patients cannot eat normally due to pain and discomfort, indicating deterioration of health in general. Halitosis may also accompany the condition. Severe erosive stomatitis can also be associated with immunological diseases [1].

A possible reason for the onset of erosive stomatitis can be the intake of allergens or direct contact of the traumatic element with the oral mucosa of the patient. Air-flow treatment is widely used in prophylaxis and treatment of periodontal disease. It is used for teeth cleaning or polishing with a jet of compressed air containing an abrasive powder [2]. Different side effects of this treatment including gum erosions and emphysema have been described [3, 4, 5]. Erythritol is a sugar alcohol that is a water-soluble and non-toxic agent previously used as a food additive in confectionery and baked products and calorie-reduced food as a sweetener [6]. In dental practice, it is used as a low-abrasive air-flow powder with a mechanical effect on biofilm and a biochemical effect on bacteria [7].

Case report

A 49-year-old female patient was referred to the Department of Oral Medicine and Periodontology because of severe erosive and suspected necrotic changes on lips and gums, upper lip swelling and severe pain lasting for 15 days. In the anamnestic details, the patient states that the symptoms started to appear after the dental treatment which included the ultrasonic teeth cleaning followed by air-flow treatment with Erythritol

powder containing 0.3% chlorhexidine (Air Flow® Powder PLUS). The patient had information of chlorhexidine digluconate 0,2% solution used in treatments with diode laser following the prophylaxis treatment, stating that she had severe pain with a burning sensation at one of the visits where this form of treatment was used. The patient stated that she was prescribed Periodontal Gel Perioplus with CITROX®/P formula and 0,5 % chlorhexidine as a treatment for the oral lesions appeared after the treatment.

During the clinical examination, we observed a severe presentation of suspected necrosis in the gum tissue in the upper and lower jaw with erosions and ulcerations on lips mucosa (Figure 1). The marginal gingiva was distinctly ischemic and distinctly white in color. Lips were swollen and dry. There was no enlargement of regional lymph nodes on palpation. The patient complained of severe pain, difficulty in opening her mouth due to pain and difficulty in eating and drinking.

The patient was prescribed antibiotics: Amoxicillin (a 500 mg) and Metronidazole (a 250 mg), Lysobact oribletes (6-8 a day), Panthenol solution for rinsing (3 times a day), and a magistral medicine with Pronisone for local application.



Figure 1. First visit clinical presentation
A, B – Mucosa and gums in upper jaw
C, D – Mucosa and gums in lower jaw

In the second visit, five days after, a significant reduction of clinically visible changes is registered (Figure 2). The patient states a significant reduction in pain and easier consumption of food and drink. Therapy administered at the first visit was continued with the exclusion of antibiotics 10 days from the beginning of the treatment.

Fifteen days from the first visit, patients' condition is very satisfactory. The patient states the absence of pain and easier implementation of oral hygiene measures and consumption of food and drinks without expressed subjective difficulties. The presence of small lesions in the epithelialization is clinically visible (Figure 3), and the therapy was continued with Panthenol solution, magistral medicine with Pronisone, according to previous instructions, and additionally, the use of AD vitamin drops to coat locally on the oral mucosa.

Discussion

Necrotizing conditions of periodontal tissues are most severe disorders caused primarily by bacterial plaque and necrotizing ulcerative gingivitis, periodontitis, or stomatitis in which the affected area include other parts of the oral cavity, such as the tongue, cheeks or palate [8], are now thought as different stages of the same process [9]. In the case of the patient presented in this care report, we are not certain regarding the cause of the disease. According to the anamnestic data, Erythritol powder containing 0.3% chlor-hexidine for air-flow treatment and chlorhexidine digluconate 0,2% solution was used in the previous treatment of the patient, and the



Figure 2. Second visit clinical presentation

A, B – Mucosa and gums in upper jaw after five days
C, D – Mucosa and gums in lower jaw after five days



Figure 3. Third visit clinical presentation

A, B – Mucosa and gums in upper jaw after fifteen days
C, D – Mucosa and gums in lower jaw after fifteen days

exact protocol and method of application of this agent are not known to us. Chlorhexidine is known to be used as a strong local antiseptic in the form of solutions, aerosols, medicinal ointments, creams and jellies, but we also know that on injured skin 1% solution of chlorhexidine causes pain of varying intensity and that the higher concentration of 0.2% chlorhexidine gluconate irritates the

conjunctiva [10]. Chlorhexidine digluconate is also used for root canal rinsing and is known for the formation of the brown deposits in the hard teeth structures, and this can be an explanation of the brownish deposits on patients lower teeth. Newer studies also suggest that the wider use of chlorhexidine gluconate in daily-use products and cosmetics is probably a reason for sensitization to this powerful antiseptic [10, 11]. Allergic reactions to chlorhexidine digluconate from mouthwashers have been reported in many studies [12]. Earlier published case report presented a case of hypersensitive reaction to 0.004% chlorhexidine digluconate in toothpaste including swelling with erythematous free and attached gingiva and studies presented cases of desquamations and ulcerations after the use of chlorhexidine digluconate products [13]. Chlorhexidine digluconate 1% gel caused mucosal and gingival reaction presented with white patches or ulcerations in 8 out of 12 patients included in a study by Almqvist and Luthman [14]. Air-flow Erythritol powder used in the presented clinical case contains 0.3% chlorhexidine, was added by the manufacturer for powder conserving purposes and not for the therapeutical effect [15], but it is not clear if the added chlorhexidine had some additional effect on the tissues, especially if used with an additional source of chlorhexidine in the treatment.

Conclusion

Due to the proven possible side effects of chlorhexidine digluconate, uncritical use of chlorhexidine digluconate should be avoided. When using products containing chlorhexidine digluconate, close control of the patient and knowledge of possible negative effects of its use, as well as possible therapeutic options for their treatment, are necessary. The cumulative effect of chlorhexidine when using multiple agents containing chlorhexidine should be further investigated.

The therapy applied in the presented case proved to be extremely effective in the treatment of

changes occurred as a side effect of the use of Erythritol powder containing 0.3% chlorhexidine and 0,2% chlorhexidine digluconate antiseptic solution.

Acknowledgments

The authors have no financial interest relevant to this article to disclose.

Disclosure statement:

The authors report there are no competing interests to declare.

Disclosure of conflicting interest:

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

1. Reynaers A, Degreef H. Severe erosive stomatitis: association with immunological diseases? *Dermatology* 1997;194(4):411-15.
2. Petersilka GJ. Subgingival air-polishing in the treatment of periodontal biofilm infections. *Periodontol* 2000. 2010;55(1):124-42.
3. Lee ST, Subu MG, Kwon TG. Emphysema following air-powder abrasive treatment for peri-implantitis. *Maxillofac Plast Reconstr Surg.* 2018;40(1):12.
4. Petersilka GJ, Bell M, Haberlein I, Mehl A, Hickel R, Flemmig TF. In vitro evaluation of novel low abrasive air-polishing powders. *Journal of Clinical Periodontology.* 2003;30(1):9-13.
5. Kozlovsky A, Artzi Z, Nemcovsky CE, Hirshberg A. Effect of air-polishing devices on the gingiva: histologic study in the canine. *Journal of Clinical Periodontology.* 2005;32(1): 329-34.

6. Munro IC, Berndt WO, Borzelleca JF, Flamm G, Lynch BS, Kennepohl E, Bär EA, Modderman J. Erythritol: an interpretive summary of biochemical, metabolic, toxicological and clinical data . *Food Chem Toxicol.* 1998;36(12):1139-74.
7. Janus MM, Volgenant CMC, Brandt BW, Buijs MJ, Keijser BJF, Crielaard W, Zaura E, Krom BP. Effect of erythritol on microbial ecology of in vitro gingivitis biofilms. *J Oral Microbiol.* 2017;22;9(1):1337477.
8. Horning GM, Cohen ME. Necrotizing ulcerative gingivitis, periodontitis, and stomatitis: clinical staging and predisposing factors. *J Periodontol* 1995;66:990-8.
9. Bolivar I, Whiteson K, Stadelmann B, Baratti-Mayer D, Gizard Y, Mombelli A, et al. Bacterial diversity in oral samples of children in niger with acute noma, acute necrotizing gingivitis, and healthy controls. *PLoS Negl Trop Dis* 2012;6:e1556.
10. Opstrup MS, Johansen JD, Zachariae C, Garvey LH. Contact allergy to chlorhexidine in a tertiary dermatology clinic in Denmark. *Contact Dermatitis.* 2016;74(1):29-6.
11. Liippo J, Kousa P, Lammintausta K. The relevance of chlorhexidine contact allergy. *Contact Dermatitis* 2011;64(4):229-34.
12. Watts TJ, Thursfield D, Haque R. Fixed drug eruption due to chlorhexidine mouthwash confirmed by lesional patch testing. *J Allergy Clin Immunol Pract* 2019;7(2):651-2.
13. Kotsailidi EA, Kalogirou EM, Michelogiannakis D, Vlachodimitropoulos D, Tosios KI. Hypersensitivity reaction of the gingiva to chlorhexidine: case report and literature review. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2020;130(2):156-60.
14. Almqvist H, Luthman J. Gingival and mucosal reactions after intensive chlorhexidine gel treatment with or without oral hygiene measures. *European Journal of Oral Sciences,* 1988;96:557-60.
15. Müller N, Moëne R, Cancela JA, Mombelli A. Subgingival air-polishing with erythritol during periodontal maintenance: randomized clinical trial of twelve months. *J Clin Periodontol.* 2014;41(9):883-9.