EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 2
Issue: 6
79-80
Year: 2015

USE OF PENTOXIFYLLINE IN THE MANAGEMENT OF ORAL SUBMUCOUS FIBROSIS: A REVIEW

Saif Rauf Siddiqui[1*], Gautam Kumar V.S.[2], Madhulika Srivastava[3], Sumbul Fatima[4]

[1]Reader, Dept. of Oral and Maxillofacial Surgery, Saraswati Dental College & Hospital, Lucknow (U.P).
[2]Senior Lecturer, Dept. of Prosthodontics, Saraswati Dental College & Hospital, Lucknow (U.P).
[3]Seniour Lecturer, Department of Pedodontics & Preventive Dentistry, Babu Banarasi Das College of Dental Sciences, Lucknow (U.P).
[4]Lecturer, Babu Banarasi Das College of Dental Sciences, Lucknow (U.P).

***Author for Correspondence: Dr. Saif Rauf Siddiqui**
Reader, Dept. of Oral and Maxillofacial Surgery, Saraswati Dental College & Hospital, Lucknow (U.P).

Article Received on 26/08/2015 **Article Revised on 17/09/2015** **Article Accepted on 08/10/2015**

ABSTRACT
Oral submucous fibrosis is a potentially malignant condition with chronic progressive presentation of clinical features. It is mainly associated with the use of betel quid containing areca nut. It shows inflammation, increased deposition of submucosal collagen and fibrotic band formation resulting decreased mouth opening. Pentoxifylline is a tri-substituted methylxanthine derivative, with a number of biologic activities like fibrinolytic, hemorheological, immunomodulatory anti-inlammatory effects. Pentoxifylline may be used singly or in combination with other treatment options for the management of oral submucous fibrosis. This review is based on usage of the drug, mechanism of action, adverse effects and highlights its use in the management of oral submucous fibrosis.

KEYWORDS: Pentoxifylline, Oral submucous fibrosis, Areca nut.

INTRODUCTION

Oral sub mucous fibrosis (OSMF) was first described by Schwartz in 1952 and is a potentially malignant disorder affecting the oral regions.[1] OSMF is insidious chronic disease common in patients chewing areca nut in the south-east Asian countries and characterized by the progressive increase of the collagen fiber bands in the oral structures including cheeks, lips, tongue, palate and pharynx. It ultimately results in reduced mouth opening, restricted tongue movements, and can cause problems in speech and swallowing.[2,3] OSMF can occur in all age groups and in all socioeconomic groups. Most commonly the patients belong to age group of 45-54 years.[4]

Areca nut (component of the betel quid) is the fourth most common psychoactive substance in the world after that of caffeine, alcohol and nicotine. Several million people in world use the areca nut.[5] It has been estimated that betel quid is used by about 10–20% of the world's population and that globally up to 600 million users chew areca nut.[5]

The prevalence of OSMF found in several studies is 2.01% and malignant transformation rate of 7-13% has been reported in the literature.[5,6] Altered keratinocyte phenotype and Genomic instability has been found to play an essential role in malignant transformation.[6]

Other etiological factors for the OSMF are chilli consumption, nutritional deficiency states, genetic susceptibility, autoimmunity & collagen disorders.[7]

The fact of having various etiopathogenesis had made OSMF a complex disease and challenging for treatment with no single mode of management. Also in many times, the disease tend to progress after starting of the treatment.[8]

Conventional treatment includes steroids, enzymes like hyaluronidase, trypsin, chymotrypsin and placental extracts advocated intra-lesionally along with oral drugs like carotenoids, Alpha lipoic acid (ALA), lycopene, vitamins and microelements have been advocated. Surgical treatment modalities of OSMF remain controversial. Physiotherapeutic treatment includes inter-positioning of tongue spatulas between teeth and adding a new spatula every 5 to10 days. Newer modalities like gamma Interferon, pentoxifylline, and tea pigments also have been found to be beneficial.[1,2,8,9]

Pentoxifylline: It is a tri-substituted methylxanthine derivative known to have many biological activities like anti-inflammatory, vasodilating and immune modulation properties.[1,10]

After oral administration, its aqueous solution is almost completely absorbed. It has first pass metabolism and several metabolites appear in plasma after administration. The peak levels appears in about 2 hours.[11] Efficacy of pentoxifylline has been proved in several dermatological conditions in various studies.[11]

Mechanisms of action: Several hypotheses were put forwards to explain the mechanism of action of pentoxifylline, its cellular and molecular effects.[11]

It is also termed as a "Rheologic modifier", as it improves microcirculation and decreases platelet aggregation as well as granulocyte adhesion. The medication also has antiplasmin activities, antithrombin and fibrinolytic activity. In addition, it causes degranulation of neutrophils, promotes natural killer cell activity and inhibits T-cell and B-cell activation.[10,11]

The most important action of pentoxifylline is that it increases locoregional blood flow.

It improves blood flow by a multiple processes[10-2]

1. Inhibits cAMP phosphodiesterase and thereby increases cAMP and ATP in RBCs, improving their deformability.
2. Promote streamlined blood flow by inhibiting ICAM expression, minimizing leukocyte adherence to endothelial cells, increasing prostacycline production and inhibiting platelet aggregation.
3. By increasing prostacycline levels and decreasing thromboxane effect, pentoxifylline dilates capillaries.
4. Decreases plasma fibrinogen concentrations and increases fibrinolytic activity.

Each of these effects alone could improve vascular blood flow. In concert, these effects decrease both whole blood viscosity, and systemic vascular resistance. Several studies has been done to study these actions of pentoxifylline in OSMF and most of them found it is effective in the management of OSMF.[1,2,11,12]

Contraindications

Contraindications include intolerance to pentoxifylline or other xanthine derivatives, recent retinal or cerebral hemorrhage and risk factors for hemorrhage, pregnancy and lactation. Caution needs to be exercised for patients with decreased hepatic, renal or cardiac function and for patients on anticoagulant therapy.[12]

Adverse effects

Overall, pentoxifylline is a very safe drug and is usually well tolerated. The side-effects are dose-related and the most common are those of the gastrointestinal tract and central nervous system. The main central nervous system side effects are dizziness, headache, anxiety and confusion.[11]

CONCLUSION

The management that is available currently is clearly inadequate and pentoxifylline can be a good option as an adjuvant drug. There is however a high-quality randomized controlled trials is needed with carefully selected and standardized outcome measures.

REFERENCES

1. Mulk BS, Deshpande PS, Velpula N, Chappidi V, Chintamaneni RL, Goyal S. Spirulina and Pentoxyfilline – A Novel Approach for Treatment of Oral Submucous Fibrosis. Journal of Clinical and Diagnostic Research. 2013; 7(12):3048-50.
2. Mehrotra R, Singh HP, Gupta SC, Singh M, Jain S. Pentoxifylline Therapy in the Management of Oral Submucous Fibrosis. Asian Pacific J Cancer Prev 2011; 12:971-4.
3. Wollina U, Verma SB, Ali FM, Patil K. Oral submucous fibrosis: an update. Clinical, Cosmetic and Investigational Dermatology 2015; 8:193–204.
4. Solanki G, Lohra N, Lohra J, Solanki R. A review on oral submucous fibrosis. Journal of Advanced Nursing Practice. 2014; 1(1):26-27.
5. Ali FM, Aher V, Prasant MC, Bhushan P, Mudhol A, Suryavanshi H. Oral submucous fibrosis: Comparing clinical grading with duration and frequency of habit among areca nut and its products chewers. J Can Res Ther 2013; 9:471-6.
6. Ali FM, Patil A, Patil K, Prasant MC. Oral submucous fibrosis and its dermatological relation. Indian Dermatol Online J 2014; 5:260-5.
7. Aara A, Satishkumar GP, Vani C, Venkatreddy M, Sreekanth K, Ibrahim M. Comparative Study of Intralesional Dexamethasone, Hyaluronidase & Oral Pentoxifylline in Patients with Oral Submucous Fibrosis. Global Journal of Medical Research 2012; 12(7):1-15.
8. Fedorowicz Z, Chan Shih-Yen E, Dorri M, Nasser M, Newton T, Shi L. Lack of reliable evidence for oral submucous fibrosis treatments. Cochrane Database Syst Rev 2008; 4:8-9.
9. Shevale VV, Kalra RD, Shevale VV, Shringarpure MD. Management Of Oral Sub-Mucous Fibrosis: A Review. Indian Journal of Dental Sciences 2012; 4(2):107-13.
10. Ghom AG, Gupta M, Deoghare A, Diwan R, Khandelwal A, Gandhi A. Comparison between Efficacy of Hydrocortisone / Hyaluronidase and Triamcinolone / Hyaluronidase in Combination with Lycopene /Pentoxifylline / Placebo Oral Supplementation in Treatment of Trismus in OSMF Patients. Chhattisgarh Journal of Health Sciences 2013; 1(1):8-11.
11. Hassan I, Dorjay K, Anwar P. Pentoxifylline and its applications in dermatology. Indian Dermatol Online J, 2014; 5:510-6.
12. Rajpal PS, Pagare SS, Shetty A, Sachdev GD. Update on Pentoxifylline for the Management of Oral Submucous Fibrosis. J Res Adv Dent 2015; 4:1:169-173.