HISTOPATHOLOGICAL EVALUATION OF ORAL SUBMUCOUS FIBROSIS: A MICROSCOPIC STUDY

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Abstract:

Background: Oral submucous fibrosis is an incidious, precancerous, chronic diseases which affect the entire oral cavity and sometime extend to the pharynx. Clinically, there is a limitation of mouth opening. Microscopically, subepithelial inflammatory reaction and fibrosis in the lamina propria along with epithelial atrophy. The present study is aimed to evaluate the role of chronic inflammatory cell aggregation in relation to the epithelial thickness in different grades of oral submucous fibrosis.

Methods: About 40 cases of oral submucous fibrosis were included for the study. The tissue sections were stained with Haematoxylin and Eosin. The tissue section of oral submucous fibrosis was studied under the microscope, graded and recorded based on Sirsat and Pindberg classification. The thickness of epithelium and the amount of chronic inflammatory cell infiltration was measured and recorded by using computer image analysis software (Axioversion Rel 4.8).

Results: Our study showed that Grade II was the higher in both epithelial thickness as well as the amount of chronic inflammatory cell infiltrate than Grade III and Grade I of oral submucous fibrosis.

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Conclusion: This study concludes that progressive decrease in epithelial thickness as the grade of oral submucous fibrosis increase, but could not arrive at any conclusive criteria to evaluate the chronic inflammatory cell infiltrate in different stages of oral submucous fibrosis. Hence, the newer scientific technologies has to be carried out in this field to arrive at conclusive findings.

Keyword: Oral Submucous fibrosis: Epithelial thickness: Chronic inflammatory cell

Introduction:

Sushruta, the ancient Indian medical literature describes a condition called VIDARI under mouth and throat depigmentation of oral mucosa where pain on taking food also occurs. These are the typical feature of oral submucous fibrosis. In 1952 Schwartz, described a fibrosing condition in the mouth of 5 female patients from East Africa for which he coined the term idiopathica tropica mucosa oris. Although the term idiopathica scleroderma of the mouth and juxtra epithelial fibrosis have also been used.[1] The term Oral Submucous Fibrosis(OSMF) is most widely accepted and it was coined by Joshi.[2]

Various factors have been implicated in the development of oral submucous fibrosis, the most common of which is chewing areca nut. Role of genetic susceptibility and nutritional factor especially chilli has been implicated in causing oral submucous fibrosis.[2] Associations with tobacco use and vitamin deficiency have also been reported. The exact role of any one of these in the development, severity and extent of the disease is not clear, as the disease may still occur if none of these is present.[3] Pillai et al suggested that the etiology is complex even though the actual mechanism is obscured.[3]

Histopathologically, the connective tissue changes in oral submucous fibrosis were described by sirsat and pindbeg on the histological basis under the categories like very early, early, moderately advanced and advanced stages.[1]

Very early changes were characterized by finely fibrillar collagen, interspersed with oedema and strong fibroblastic response. The blood vessels were often dilated and congested. Inflammatory cells in this stage consist of polymorphs and eosinophils.

In early changes, there was juxtraepithelial hyalinization. The collagen was thickened and seen as sepertae bundle. An inflammatory cell consists of lymphocyte, plasma cell and occasional eosiniophils.

In moderately advanced and advanced stages, there was hyalinization off connective tissue to a variable extent. There was no oedema and the predominant inflammatory cells were lymphocyte and plasma cell.

The epithelial changes in different stages are hyperplasia (early) to atrophy(advanced) associated with increase in tendency of fibrosis. There is loss of rete ridges are also present.

Thus there is a gradual change in thickness of epithelium and the amount of the inflammatory infiltrate in different stages of oral submucous fibrosis but whether there is any correlation between these two is not yet reported.

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Hence, this particular study is aimed

(1) To measure the thickness of epithelium and chronic inflammatory cell infiltrate in different stages of oral submucous fibrosis

(2) To find the role of subepithelial chronic inflammatory infiltrate on overlying epithelium with regard to its thickness

Material method:

40 cases of diagnosed oral submucous fibrosis wax blocks were selected from the archival of wax blocks. Sections were taken and stained with Haematoxylin and Eosin. The cases were graded as early(I), moderate(II), advanced (III) based on Sirsat and Pindberg system.

Epithelial thickness and chronic inflammatory infiltrate were measures at 5 different representative regions in each section. Chosen regions were devoid of any tissue artifact. Epithelial thickness was measured from the superficial keratotic area to basal layer using computer image analysis software (Axioversion Rel 4.8). Similarly, chronic inflammatory cell infiltrate was also measured. Obtained values were undergone for statistical analysis.

Student‘t’ test was used to evaluate the epithelium thickness and inflammatory cells infiltrate in various grades. ANOVA test was used to compare the epithelial thickness and chronic inflammatory cell infiltrate in different grades.

Result:

In the present study, it was found that, grade II(8.871μm) was the higher in thickness, followed by grade III(5.457μm) and grade I (3.355μm) in decreasing order.(Table.I). Further it was found that the amount of chronic inflammatory cell infiltrate is higher in Grade II (38 μm) then Grade III (29μm) and Grade I (10μm) of OSMF. (Table II). There is a negative correlation between epithelial thickness and thickness of subepithelial inflammatory cell infiltrate were found(Table III).

Discussion:

Oral Submucous fibrosis is an insidious, precancerous, chronic disease that may affect the entire oral cavity and sometime extend to the pharynx. Although, it is occasionally preceded by the formation of vesicles, oral submucous fibrosis is always associated with a subepithelial inflammatory reaction followed by fibroelastic changes of the lamina propria, accompanied by epithelial atrophy. Hence, we studied the epithelial thickness and chronic inflammatory cell infiltrate in various grades of oral submucous fibrosis and also to find out the correlation between these factors.[3]

In literature, Rajendran and anita balan reported that thickness of epithelium alter in all the grade of oral Submucous fibrosis. The inflammatory component and sclerosing component changes according to grades of oral submucous fibrosis.[4]Later he suggested that the excessive fibrosis in the connective tissue seems to be the primary pathology in oral submucous fibrosis. The atrophic changes in the epithelium are the secondary. [5]

The irritating agent exacerbate the fibrosis in submucosa initiated by chronic inflammatory cells which synthesize and proliferate the fibroblast and also by stabilizing the collagen that they produce.[6]A dense, chronic inflammatory infiltrate may influence epithelial change ranges from atrophy accompanied by hyperkeratosis to dysplasia. [7]

Associations of chronic inflammation with an oral submucous fibrosis have been recognized and showed significant role in these lesions i.e. the inflammatory cell may influence the epithelium of oral submucous fibrosis.

Association of chronic inflammation with a variety of epithelial malignancies have been recognized for centuries. Chronic inflammatory cell infiltrate showed significant differences in various lesions. Hyperkeratotic without acanthosis showed a smaller number of mononuclear

cells. [8] Balance between the proliferating and opposing influence of various cytokines have overall effect on keratinocytes thus influencing the epithelial atrophy and hyperproliferation which also reflects peculiar local influences.[8]

The correlation between the epithelium and chronic inflammatory cell infilterate could not been established in our study as there is increase chronic inflammatory cell infilteration in grade II than grade I and grade III. Though there may be no real decrease in chronic inflammatory cell infiltrate in grade III, they may appear so due to fibrosis. As similar studies are not reported in earlier literature we are unable to compare our result with previous studies. Hence further molecular studies are require to elicite the quantity and quality of inflammatory cells and their role on the epithelium of oral submucous fibrosis.

Conclusion:

From our study we conclude that there is progressive decrease in the epithelial thickness as the grade of oral submucous fibrosis increase. The amount chronic inflammatory cell infiltrate is higher in Grade II when compare to Grade I and Grade III.

List of References:

1. JJ Pindborg, SM Sirsat. Oral Submucous fibrosis. Oral Surg Oral Med Oral path 1966;22(6):764-79.
2. Naseem shah, Rani Kumar, Manoj K Sing. Hematological and Histological studies in Oral Submucous Fibrosis. JIDA 1993; 64: 383-87.
3. Haider SM, Merchant AT. Clinical and functional staging of oral Submucous fibrosis.Br J Oral Surg 2000; 38:12-15.
4. Kiran kumar K, TR saraswathi,K Ranganthan, M Uma Devi, Joshua Elizabeth. Oral Submucous Fibrosis. A clinicopathological study in Chennai. IJDR 2007; 18(3): 106-111
5. Rajendran R, Shivapathasundharam. Shafer's Textbook of Oral Pathology. 6th edition. Elsevier publications.
6. Canniff, Harvey, Harris. Oral Submucous fibrosis: its pathogenesis and management. Br Dent J 1986;160:429-34.
7. Sylvie Louise Avon. Oral mucosal lesions associated with use of quid. J Can Dent Assoc 2004;70(4): 244-8.
8. Usha Balan, Nitin Gonsalves, Maji Jose. A quantitative evaluation of epithelium and inflammatory infiltrate of lichen planus and lichenoid reaction. OMPJ 2012;3(2): 233-37.

Tables showing epithelium thickness and lymphocytic aggression in various grades of Oral submucous fibrosis

Table. I: Epithelial thickness in different grades of Oral submucous fibrosis

Grade	No. of cases	Mean	Std.Dev
I	8	21.538	3.355
II	21	19.081	8.871
III	11	17.164	5.457

Table. II: Chronic inflammatory cell infiltration in different grades of Oral Submucous fibrosis

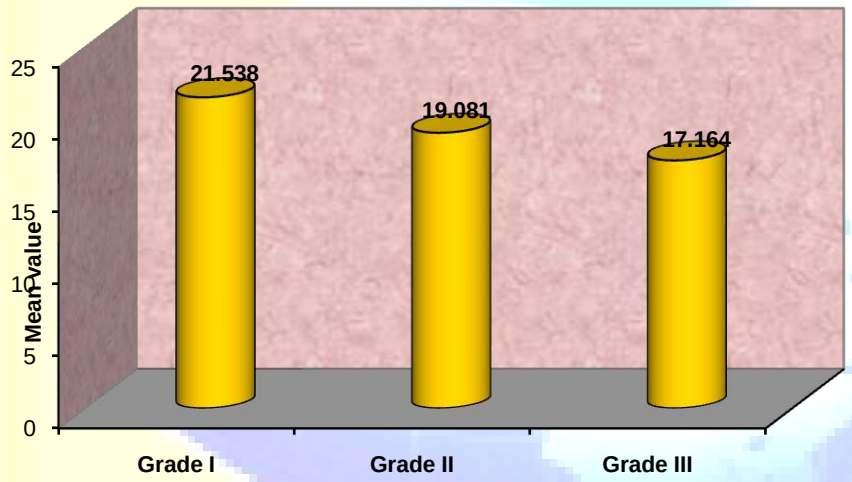
Grade	No. of cases	Mean	Std.Dev
I	8	10	30
II	21	38	47.5
III	11	29	22.5

Legends of the figure:

Fig 1: Photomicrograph of oral submucous fibrosis showing an epithelium and hyalinised connective tissue. (Hematoxylin and Eosin, Magnification- X400).

Legends of the graphs:

Graph 1: Graph showing thickness of epithelium in various grades of OSMF.



Graph 2: Graph showing lymphocytic aggression in various grades of OSMF