

ORAL SUBMUCOUS FIBROSIS WITH ITS POSSIBLE EFFECT ON EUSTACHIAN TUBE FUNCTIONS: A TYMPANOMETRIC STUDY

S.C. Gupta¹, Mangal Singh², Sanjay Khanna³, Sachin Jain⁴

ABSTRACT : *Oral submucous fibrosis (OSMF) is a chronic inflammatory condition of oral cavity. The common sites of involvement are cheek, tongue and soft palate. The pathological changes not only involve the mucosa and submucosa but also extend deeper to involve the underlying muscles. Atrophic and degenerative changes in the tubal and paratubal muscles have already been reported and involvement of these muscles may lead to eustachian tube dysfunction. The present study was therefore, planned to assess the eustachian tube functions by tympanometry in cases of OSMF. Out of 106 ears in 53 cases, 80 ears (75.5%) showed normal type-A curve. Abnormal tympanograms included type -B curve in 17 (16.0%) and type-C curve in 9 (8.5%) ears. On testing the compliance of middle ear there was shift in the compliance peaks in 78 (73.6%) ears with +200 daPa pressure change indicating normal eustachian tube functions. In 28 (26.4%) ears, eustachian tube functions were found to be affected as there was no shift in the compliance peaks. Similarly on -200 daPa pressure change in 24 (22.7%) ears there was no shift in compliance peaks. An identical study was also carried out in 40 ears of 20 normal individuals. The data derived were statistically much higher in the disease group. Therefore, it was concluded that eustachian tube functions may be affected in OSMF.*

Key Words *Oral Submucous Fibrosis, Eustachian Tube Functions, Tympanometry*

INTRODUCTION

Oral submucous fibrosis (OSMF) has been defined as a slowly progressive disease in which fibrous bands form in the oral mucosa leading to severe restriction of movements of the jaw including tongue¹. The disease is prevalent in the Indian subcontinent. The aetiology is still obscure. Chronic irritation is thought to be the underlying cause in the pathogenesis of OSMF. The common irritants

are betelnut, chillies, tobacco, "misi" (an indigenous tooth powder) and clay chewing^{2,7}.

The disease is usually associated with vesicles formation and juxtra epithelial inflammatory reaction followed by fibroelastic changes in the lamina propria with epithelial atrophy leading to stiffness of the oral mucosa causing trismus and resulting difficulty in eating⁸.

Professor and Head¹ Associate Professor² Ex Resident³ Resident⁴ Department of ENT Motilal Nehru Medical College Allahabad
211 001 U P India

Involvement of the soft palate is a prominent feature in OSMF. Pathological changes in the muscles of the soft palate have been described by various workers.^{9,10,11} Degenerative changes, oedematous muscle fibres and atrophy in palatal and paratubal muscles have been reported by Gupta et al.¹² Involvement of these muscles subsequently may affect the functions of eustachian tube. The present study therefore, has been planned to assess the eustachian tube functions by tympanometry in cases of OSMF.

MATERIAL AND METHODS

The study was carried out in the department of ENT, MLN Medical College, Allahabad, from August 1997 to July 1998 on 53 patients (106 ears) suffering from OSMF. The clinical profile of the patients was worked out by taking detailed history and clinical examination.

Audiological assessment was done by using a clinical audiometer Wlesch Allyn model GSI 61 and eustachian tube functions by an impedance audiometer Siemens SD 30.

Procedure of impedance audiometry

The patients' ability to equalize pressure difference between the surroundings and the middle ear is called the "Tube Function". If the patient's tympanic membrane is intact, this measurement is performed in AUTOTYMP mode. The audiometer can automatically give the patient a constant over or under pressure of 200 daPa, in the auditory canal. The patient must swallow 8-10 times so that the over/under pressure which the tight tympanic membrane has caused in the middle ear is equalized. The examiner records a compliance graph and if the eustachian tube functions correctly, the middle ear pressure must now have moved in the opposite direction of the static pressure. Thus the shifted compliance peaks show that eustachian tube functions are good. If there is no shifting of compliance peaks then it is poorly functioning.

By charting the compliance of tympano-ossicular system against various pressure changes, different types of tympanograms were obtained.

OBSERVATION AND RESULTS

In the present study hospital based prevalence of OSMF was found to be 0.26% of all the outdoor ENT patients, most of the cases were in second and third decade of life. The rise in the percentage prevalence was because of

increase in consumption of 'pan-masala' among adolescents and young adults. Male to female ratio was 3:07:1 and majority of the patients were Hindus.

The patients, with OSMF, presented with difficulty in opening mouth, repeated vesiculation and ulceration of oral mucosa, intolerance to chillies and spices, burning sensation in mouth, difficulty in blowing out cheeks and inability to protrude tongue. Few patients complained of heaviness, blockage or pain in ear.

On puretone audiometry hearing was found to be normal in 84 (79.2%) ears, mild to moderate conductive hearing loss in 19 (18.0%) ears and sensory neural hearing loss in 3 (2.8%) ears.

Tympanometry was done in all the cases. Out of 106 ears examined, normal tympanogram type-A curve was recorded in 80 (75.5%) ears. Abnormal tympanograms included type-B curve in 17 (16.0%) and type-C curve in 9 (8.5%) of ears.

Out of 106 ears, eustachian tube function test revealed shift in compliance peaks in 78 (73.6%) ears with +200 daPa pressure change after swallowing and it was absent in 28 (26.4%) ears. With -200 daPa pressure change, shifting of compliance peaks observed in 82 (77.3%) whereas no shifting of compliance peaks was seen in 24 (22.7%) ears.

A similar study was also done in 40 ears of 20 normal identical individuals as a control group to establish the validity of data in the disease group. In 35 (87.5%) of ears a normal type-A curve was obtained. Out of 5 abnormal tympanograms, 4 showed type-B and one had type-C curve. On testing the compliance 36 (90%) out of 40 ears showed normal eustachian tube functions.

DISCUSSION

Oral submucous fibrosis is predominantly a disease of oral cavity and oropharynx. A variety of histopathological changes in oral mucosa have been described by various workers. However, only few authors have reported muscle degeneration in their study. They took punch biopsies from the buccal mucosa and reported changes in the buccal muscle layers. In their electron microscopic study, El-Labban and Camiff¹¹ compared the ultrastructural changes in muscle fibres in patients with relatively normal and severely restricted mouth opening in OSMF patients. They

found that the tissue from patients with restricted mouth opening showed severe degenerative changes in high proportion of muscle fibres. These fibres contained large pools of homogenous material. Muscle cells or fibres exhibiting complete loss of their plasma membrane were also found. These muscle fibres were often surrounded by oedematous fluid.

The main muscles attached to the eustachian tube and the soft palate are the tensor veli palatini and levator veli palatini. These two muscles and the other accessory muscles are referred to as palatal/paratubal muscles. The cartilaginous portion of the eustachian tube and its musculature is a dynamic organ and its ventilatory function and patency may be impaired if these muscles are involved.

Gupta et al¹² have reported histopathological changes in the palatal muscles in OSMF on incisional biopsies. They have described atrophy and oedematous infiltration of tubal and paratubal muscles. Extension of fibrosis into nasopharynx involving the pharyngeal orifice of eustachian tube and changes in the muscles affect the functions of eustachian tube.

In present study tympanometry revealed an abnormal tympanogram in 26 (24.6%) ears in cases of OSMF. Similarly on testing the compliance in a considerable percentage of cases eustachian tube functions were not normal. On comparing these data of the disease group with that of control group, a statistically significant higher percentage of cases of abnormal eustachian tube functions were noted in the former. Therefore, it is concluded that the eustachian tube functions may be affected in OSMF.

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Address for Correspondence :

Dr S C Gupta, M S ,
Professor & Head of Department of ENT,
MLN Medical College, Allahabad - 211 001,