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Original Research

To evaluate the level of serum immunoglobulin G and A oral submucous fibrosis patients

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ABSTRACT:
Aim: To evaluate the level of serum immunoglobulin G and A oral submucous fibrosis patients. **Methods:** The current study looked at serum immunoglobulins as a diagnostic marker for oral submucous fibrosis in 100 people, 50 of whom had clinically verified OSMF and 50 who were in the control group and reported. The controls were age and sex-matched participants with no bad habits, mouth lesions, or systemic disorders. Serum immunoglobulins were measured using the Immunoturbidimetric Assay. **Results:** The blood immunoglobulin levels in the study and control groups are compared in Table 2. Serum IgG levels in the control group ranged from 715.11 to 1588.5 mg/dL, with a mean of 1082.56±225.69 mg/dL. Serum IgG levels in the study group ranged from 1012.0 to 1815.0 mg/dL, with a mean value of 1312.56±212.22 mg/dL. When IgG levels in the control and study groups were compared using the ANOVA test, the difference was found to be statistically significant with P 0.000. Serum IgM levels in the control group ranged from 43.5 to 195.5 mg/dL, with a mean of 102.85±42.77 mg/dL. In the study group, serum IgM levels ranged from 40.0-230.0 mg/dL, with a mean of 101.58±39.58 mg/dL. When IgM levels in the control and study groups were compared using the ANOVA test, no statistically significant difference (P > 0.39) was discovered. **Conclusion:** An individual's elevated IgG level is a measure of inflammation. It might be a reflection of the body's current illness state. The current study's rise in blood IgG level demonstrates the chronic inflammatory character of the disorder and the likely participation of active immunity in the aetiology of this disease, implying an underlying autoimmune phenomena.
Keywords: Serum immunoglobulin G, immunoglobulin A, oral submucous fibrosis

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INTRODUCTION

Dental and medical practitioners may meet a broad range of oral mucosal lesions in the course of their work. A accurate diagnosis is required since these lesions may range in severity from minor to life-threatening. One such lesion is oral submucous fibrosis (OSMF), which is straightforward to identify but difficult to treat. Schwartz dubbed the condition "Atrophia idiopathica (tropicum) mucosum oris" when he originally characterised it in 1952. This was quickly followed by Lal and Joshi's first description of this ailment in India in 1953. [1] OSMF is defined by Pindborg as "an insidious chronic illness affecting any portion of the oral cavity and occasionally the throat" based on clinical and histological findings. Although vesicle formation is occasionally preceded and/or associated with it, it is always associated with a Juxta-epithelial inflammatory reaction followed by a fibro elastic change of the lamina propria with epithelial atrophy causing stiffness of the oral mucosa and causing trismus and inability to eat." [2,3]

It is a chronic progressive condition with clinical manifestations that vary depending on the stage of the disease at the time of clinical identification.[4] Over a 10-year period, it is anticipated that 2.5 million individuals would be impacted globally. Because it is a precursor to oral squamous cell carcinoma in 7.6 percent of patients, OSMF has a statistically significant death risk. 5 OSMF is thought to be multifactorial, with areca nut being the primary cause.[6-8] Because of the frequency of OSMF in individuals with no history of etiological agents and

different immunological alterations, many researchers believe OSMF is an autoimmune condition. [9,10] Saliva does not have a direct part in the pathophysiology of OSMF since the illness causes alterations only in the oral cavity, but it may function as a vehicle or play an indirect role. As a result, it is plausible to believe that saliva may hinder some traits that might serve as illness markers. [11] With the growing body of knowledge on immunoglobulin abnormalities and the vast range of symptoms and illnesses that may be linked with them. Studies on the immunoglobulin G and A (IgG and IgA) profiles of patients with OSMF have shown contradictory findings. [12]

MATERIALS AND METHODS

The current study looked at serum immunoglobulins as a diagnostic marker for oral submucous fibrosis in 100 people, 50 of whom had clinically verified OSMF and 50 who were in the control group and reported. The controls were age and sex-matched participants with no bad habits, mouth lesions, or systemic disorders. Patients with systemic illness or a history of allergy, asthma, liver disease, or autoimmune disease were barred from participating in the trial. Patients suffering from physiological problems such as pregnancy and menopause were also barred from participating. All OSMF patients were staged using Mathur RM and Jha T criteria after entering their case histories on pilot-tested Proforma and doing clinical tests (1993).[13] Serum immunoglobulins were measured using the Immunoturbidimetric Assay.

TECHNIQUES FOR COLLECTING BLOOD SAMPLES

During blood sample collection, serum separation, and storage, all standardisation procedures were followed. The patient's forearm was comfortably resting on the laboratory table. The ante-cubital fossa was revealed, and the tourniquet was placed approximately half an inch to two inches above it. A median cubital vein puncture was used to obtain blood samples. The space was made aseptic using 70% ethyl alcohol. A needle puncture was done and manipulated to enter the median cubital vein using a 5-mL sterile disposable syringe and 23-gauze needle, and 2 mL of blood was extracted. The tourniquet was then released, and the needle was withdrawn at the same time. Spirit-soaked cotton was put on the needle puncture site on the forearm, and the patient was instructed to exert finger pressure for roughly 10 minutes before discarding the cotton.

METHODOLOGY FOR SEPARATING AND STORING SERUM

The syringe's blood was transferred to a vacutainer. The vacutainer was centrifuged at 4000 rpm for 15 minutes to separate the serum from the clotted blood. The separated serum was transferred to a different container and delivered to the laboratory for immunoglobulin quantification (AU5811 from Beckman colter). The blood immunoglobulins (IgG, IgM) levels in each sample were determined using the immunoturbidimetry method, and the laboratory data were statistically evaluated to provide the mean, standard deviation (SD), comparison, and comparison probability chance value.

STATISTICAL ANALYSIS

The descriptive statistics for the variables listed above included mean and standard deviation. The resulting data were analysed using the Statistical Package for Social Science (SPSS) software version 25.0 for Windows. ANOVA unpaired student's ttest was used to compare mean values between the study group, control group, and serum immunoglobulins at various clinical phases. ($P<0.05$). All results with P values less than. 05 were deemed statistically significant.

RESULTS

The 50 research group patients ranged in age from 15 to 65 years old, with a mean age of 38.14 ±12.58 years. The demographic information for the subjects is shown in Table 1. Males outnumbered females in both the research and control groups. It was discovered that the majority of the individuals in our research chewed solely gutka (80 percent). In our investigation, all 50 (100%) study volunteers had a burning sensation, 44 (88%) had trouble opening their mouth, and 26 (52%) had difficulties swallowing. 5 (10%) of 50 OSMF patients were in stage I, 20 (40%) were in stage II, and 25 (50%) were in stage III.

DEMOGRAPHIC PARAMETER

Demographic parameter	Study group		Control group	
Gender	**Number**	**Percentage**	**Number**	**Percentage**
Male	40	80	30	60
Female	10	20	20	40
Age				
15-25	12	24	10	20
25-35	25	50	22	44
35-45	8	16	10	20
above 45	5	10	8	16
Habitat				

Gutka	40	80	2	4
Stage				
I	5	10		
II	20	40		
III	25	50		

The blood immunoglobulin levels in the study and control groups are compared in Table 2. Serum IgG levels in the control group ranged from 715.11 to 1588.5 mg/dL, with a mean of 1082.56±225.69 mg/dL. Serum IgG levels in the study group ranged from 1012.0 to 1815.0 mg/dL, with a mean value of 1312.56±212.22 mg/dL. When IgG levels in the control and study groups were compared using the ANOVA test, the difference was found to be statistically significant with P 0.000. Serum IgM levels in the control group ranged from 43.5 to 195.5 mg/dL, with a mean of 102.85±42.77 mg/dL. In the study group, serum IgM levels ranged from 40.0-230.0 mg/dL, with a mean of 101.58±39.58 mg/dL. When IgM levels in the control and study groups were compared using the ANOVA test, no statistically significant difference (P > 0.39) was discovered.

Table 3 compares serum immunoglobulins in controls and OSMF phases. When IgG levels in the control group were compared to those in the various phases of OSMF, they were found to be 1081.12±242.89 mg/dL in controls and 1348.98±121.12 mg/dL, 1242.74±244.59 mg/dL, and 1361.74±155.87 mg/dL, respectively, which was statistically significant (P = 0.03). When IgM levels were examined between the control group and various phases of OSMF, they were found to be 102.5636.55 mg/dl in the control group and 73.23±31.54 mg/dl, 112.22±48.75 mg/dl, and 97.11±29.57 mg/dl, respectively, which was not statistically significant. (P = 0.39).

		Serum IgG (mg/dL)		**Serum IgM (mg/dL)**	
		Range (700.00-1600.00)	**Mean±SD**	**Range (40.00-230.00)**	**Mean±SD**
Study	50	1012.0-1815.0	1312.56±212.22	40.0-230.0	101.58±39.58
Controls	50	715.11-1588.5	1082.56±225.69	43.5-195.5	102.85±42.77
Study vs. Control		*t*=4.255, df=57, *P*=0.000		*t*=-0.112, df=57, *P*=0.52	

Table 3: Serum immunoglobulins in controls and various stages of OSMF

	Number of cases	**Serum IgG (mg/dL)**	**Serum IgM (mg/dL)**
Control	50	1081.12±242.89	102.56±36.55
Stage I	5	1348.98±121.12	73.23±31.54
Stage II	20	1242.74±244.59	112.22±48.75
Stage III	25	1361.74±155.87	97.11±29.57
		F=3.77, *P*=0.02	*F*=0.69, *P*=0.39

DISCUSSION

Immunoglobulins are glycoproteins that are produced by plasma cells and, to a lesser degree, lymphocytes. IgG, IgA, and IgM are the most abundant immunoglobulins in serum, in decreasing order of concentration. Only a few researches on the immunological response of OSMF have been conducted throughout the previous three decades. Previous investigations on serum immunoglobulins in OSMF had mixed findings. OSMF is typically linked with hyperimmunoglobulinemia. As a result, the purpose of this research was to measure serum IgG and IgM levels in order to examine the function of humoral immune response in patients with OSMF. In our research, 50 respondents ranged in age from 15 to 65 years old, with a mean age of 38.14± 12.58 years, which is equivalent to the mean age of 29.98 years in a study performed by Pinakapani R (2009)[14] and 30.66 years in a study conducted by Taneja L. (2015). [15] However, the majority of patients in our research were in their second and third decades of life, which may be ascribed to social interactions, economic liberty, the popularity of refined areca nut products, and the product's ease of availability. These results are consistent with recent research by Trivedi CR (2000)[16] and Patidar K. (2011). [17] In our investigation, 40 of the 50 OSMF patients were male, and 10 were female, indicating a male preponderance, as reported by Patidar K (2011)[17] and Taneja L. (2015). [15]

This male preponderance in our research might be attributed to the gutkha chewing habit, which is mostly performed by young males in this region of the nation. In general, it was discovered that 40 of the 50 OSMF individuals chewed gutkha alone or in mixtures. Gutkha is a little sachet or packet containing areca nut, tobacco, lime, catechu, and flavouring chemicals. P.N et alobservation .'s of 40 patients who chewed gutkha is analogous to Sinor's observation (1990). [18] We also found OSMF in individuals who only chewed raw areca nut, which is consistent with the findings of Meher R (1994)[19] and Ranganathan (2004). [20]

A scorching sensation was evident in all 50 patients in the current investigation, which is comparable to the work of Sedat H.A. (1988).[21] This might be

related to epithelial atrophy, which could be caused by inadequate blood perfusion to nearby connective tissue. In our research, 88 percent of participants had difficulties opening their mouth, which is similar to the findings of Caniff J.P et al. (1986)[22] and Rajendran R. (1994). [23] In addition, 52% experienced trouble swallowing. According to Sinor et al., this might be related to fibrosis spreading to the throat and oesophagus (1990). [18]

In our research, 5 (10%) of 50 OSMF patients were in stage I, 20 (40%) were in stage II, and 25 (50%) were in stage III, which is equivalent to findings by Pinakpani R (2009)[14] and Taneja L (2015).[15]

The mean serum IgG levels in the control group were 1082.56±225.69 mg/das compared to the study group (1312.56±212.22 mg/dL) with P 0.000, which was statistically significant and compatible with Pinakapani R (2009),[14] Patidar K (2011),[17] and Taneja L (2011).[15]

Serum IgM levels were 102.85±42.77 mg/dL in the control group and 101.58±39.58 mg/dL in the study group, respectively. In the current investigation, there were no significant changes in IgM levels. Chaturvedi (1991)[24] and Pinakapani R observed similar findings (2009). [14] On the contrary, Shah et al. (1994)[25] and Taneja L (2015)[15] found that OSMF patients had a considerable rise in blood IgM levels.

When compared to the control group, serum IgG levels were significantly higher at all stages of OSMF (P = 0.03). The findings made above are similar to those made by Chaturvedi et al (1991)[24] and Pinakapani R. (2009). [14] The malignant potential of OSMF has been assessed and addressed by many writers in the current literature. The immunologic changes seen in OSMF are nearly identical to or comparable to those seen in oral cancer. As a result, it is fair to believe that OSMF may represent an intermediate step in the transformation of a normal cell into an oral cancer. As a result, immunologic follow-up of OSMF patients will be advantageous for early diagnosis of the OSMF transition process to oral cancer. [26]

There were no statistically significant variations in IgM levels between OSMF patients and control group trial participants. Chaturvedi and Marathe in 1988 and Taneja L in 2015 discovered similar results. [15] Chiang et al.(2002)[27] discovered a considerable increase in the quantity of T-lymphocytes and macrophages, as well as a preponderance of CD4 lymphocytes over CD8 lymphocytes, in OSMF subepithelial connective tissue. Macrophages and B-lymphocytes are the minor immunocompetent cells in subepithelial tissue and are very seldom present in OSMF epithelium.

CONCLUSION

An individual's elevated IgG level is a measure of inflammation. It might be a reflection of the body's current illness state. The current study's rise in blood IgG level demonstrates the chronic inflammatory character of the disorder and the likely participation of active immunity in the aetiology of this disease, implying an underlying autoimmune phenomena.

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