Incidence of Diabetes Mellitus in Patients with Lichenplanus
Syeda Arshiya Ara, Mamatha G.P., B. Balaji Rao

Abstract
Aims: To find out the incidence of diabetes mellitus in patients with oral lichen planus (OLP). Materials and Methods: Experimental group consists of 50 OLP subjects and control group comprised of 10 subjects. Incisional biopsy from the lesion site was obtained for experimental subjects and normal oral mucosa in the third molar region was used as biopsy specimen for control subjects. Oral glucose tolerance test (OGTT) was done for all the subjects and results were tabulated and subjected to t test for analysis. Results: The OGTT for control group in fasting level, 1 and 2 hours after glucose administration were within the physiological limits in males and females. Among the 50 OLP subjects 5 (10%) were diabetic in the age range of 42-40 with a mean of 56.5 years. The results are statistically highly significant with P value of <0.001 for FBS, 1 hour and 2 hour samples when OGTT values in OLP diabetics v/s controls are compared.

Key Words: Lichen Planus; DiabetesMellitus; Immunological Diseases.
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Introduction
Many research works are now producing evidence that systemic diseases influences the metabolism of hard and soft tissues of oral cavity. Halevy S. And Feuerman E.J. (1979) in the study of abnormal glucose tolerance associated with lichen planus supported the possibility that, lichen planus and disorder of carbohydrate metabolism could be related.(1) Histo-biochemical studies of the affected epidermal cells in cases of lichen planus have also shown abnormalities in the enzyme activity as well as defective carbohydrate expression which might have a connection with hormones essential for the metabolic process.(2)

This study was conducted a) to find out the incidence of diabetes mellitus in patients with OLP, b) to correlate any associations that may exist between OLP and diabetes mellitus, and c) to compare the incidence of glucose tolerance of controls and OLP patients. The main objective of this paper was to exclude diabetes mellitus in OLP cases, to suspect OLP in all diabetes mellitus cases and to link OLP, diabetes mellitus with immunological diseases.

Materials and Methods
This study was conducted in the Department of Oral Medicine and Radiology. They were divided into control and experimental group.

Control group: The control group comprised of 10 subjects and those who fulfilled the following criteria were included in the subject group.
1) They were in the age group of 18-35 years.
2) They were of either sex.
3) They were apparently healthy.
4) With normal oral mucosa.
5) No family history of diabetes mellitus.
6) Without any oral habits.

Experimental group: This group consisted of 50 subjects of OLP. Those who fulfilled the following criteria were included in the study group.
1) With features of OLP: The clinical evaluation of OLP was based on the classification that was proposed by Andreason (1968) who described six clinical forms of OLP.(3)
   a. Reticular-consisting of lace like keratotic lesions.
   b. Plaque with slightly raised white solitary lesions.
   c. Papular- characterized by slightly elevated white lesions approximately 0.5-1 mm in diameter.
   d. Atrophic- Combining erythema plus reticular keratosis.
   e. Bullous- and.
   f. Erosive- Manifesting small bullae and vesicles or ulceration and atrophic features respectively.
2) Patients without diabetes mellitus and without family history of Diabetes Mellitus.
3) Not on any medications
4) They were healthy, with no bar for age and sex
5) With/Without skin lesions
6) With/without burning sensation.

Methodology: The clinical examination was carried out following the method described by Kerr, Ash and Millard. A provisional diagnosis of lichen planus was made on the basis of clinical examination and incisional biopsy from the lesion site was obtained following methodology of Howe G.L. (1971). Normal oral mucosa, in the third molar region was used, as a biopsy specimen for all control subjects and was subjected for histopathological procedure. OGGT was done for the experimental subjects as per the criteria mentioned by National Diabetes Data Group (1979). The test was performed under standard conditions in the morning. Patient was instructed with the guidelines as under:
1. Patient was advised unrestrained diet, 3 days before the test.
2. All drugs that would affect the test result were withdrawn for 3 days.
3. Physical activity was unrestricted.
4. Patient was advised a fasting period of 10-16 hours before the test.

Procedure
1) Fasting blood sample of the patient was collected in the similar was as the blood collected for Haematological investigation and the time recorded.
2) 50-70 gms of glucose dissolved in 300 ml of drinking water was given orally to the patient.
3) Venous blood was collected at the end of 1 hour, 2 hour after the administration of glucose.
4) The samples were analyzed quantitatively for glucose by “Autoanalyser method”.

The results were interpreted according to the criteria proposed by National Diabetes Data Group (1979) and WHO (1985), tabulated and subjected to ‘t’ test for statistical analysis.

Results
Control group

Hemogram: In the control group all the hematological parameters were within the physiological limits in males and females.

OGGT: The minimum and maximum of Fasting Blood Sugar (FBS) in the present study was 72 mg% and 101.8 mg% with a mean of 86.6 mg% for males and 72 mg% and 90 mg% with a mean of 88.6 mg% for females. The minimum and maximum values taken after 1 hour of glucose administration in the present study was 102 mg% and 137 mg% with a mean of 107.8 mg% for males and 84 mg% and 106.2 mg% with a mean of 100.5 mg% for females. The minimum and maximum values taken, 2 hours after glucose administration was 50 mg% and 120 mg% with a mean of 81.9 mg% in males and 60 mg% and 130 mg% with a mean of 90.3 mg% for females. The OGGT for control group in fasting level, 1 and 2 hours after glucose administration were within the physiological limits in males and females.

Biopsy: All the 10 biopsy specimens of the control group histopathologically showed stratified squamous ortho or parakeratinising epithelium overlying a normal connective tissue.

Experimental group

OLP: All the 50 experimental subjects clinically showed the feature of OLP as described by Anderson (1968). Among them 34 (68%) were keratotic type, and 16 (32%) were non-keratotic type.

Sex: Out of 50 histological OLP subjects, 38 (76%) were males and 12 (24%) were females. The male to female ratio was 3:1.

Age: They were in the age group of 18-74 years with a mean age of 32.7 years for males and 18-70 years with a mean age of 47.5 years for females.

Site Distribution: OLP lesions were distributed bilaterally on the buccal mucosa in 96%, vestibule 30% of which 8% were in upper vestibule and 22% were in lower vestibule, labial mucosa 12% of which 4% were in upper labial mucosa and 8% were in lower labial mucosa, gingiva 12% of which 3% were in upper gingiva and 9% were in lower gingiva, Tongue 8% of which 6% were on the dorsal surface and 2% were on ventral surface and soft palate 6%, floor of the mouth 2%. Among them 5 had dermal lesions on the extensor and flexor surfaces of hands, plantar surfaces of wrist, dorsal surfaces of lower extremities, abdomen and back, which were violaceous, flat topped, angulated papules.

Type of Lichen Planus: The study group consisted of 34 (68%) keratotic lichen planus among which 29 males were in the age range of 18-63 years with a mean of 30.6 and 5 females were in the age range of 18-60 years with mean of 38 years. Among the non-keratotic lichen planus of 16 (32%) 9 were males in the age range of 22-74 years with a mean of 39.6 years and 7 females in the age range of 35-70 years with a mean of 57.7 years.
Among the 34 (68%) keratotic type of OLP 21 (42%) were reticular in 17 males and 4 females, 11 (22%) annular, in 10 males and 1 female, 2 (4%) plaque type in 2 males. Among the non-keratotic type of OLP the bullous variety occurred in 1 (2%) male and 15 (30%) atrophic/erosive type were distributed in 8 males and 7 females.

Histopathology: The biopsy specimens showed, microscopic features as 20% Ortho and 80% Parakeratinised stratified squamous epithelium, 32% acanthosis, 8% intracellular edema, 88% basal cell with degeneration of basal lamina, 68% saw tooth retepeds or reteridges, 100% juxtaepithelial band like chronic inflammatory infiltrate and only 1 case (20%) keratotic variety showed mild dysplastic features. The hemotological values recorded in the experimental subjects (50 OLP cases) were within the physiological limits except that there was increase of ESR in 9 subjects, with range of 25-62 mm/hr.

OGGT: The minimum and maximum fasting blood sugar (FBS) in the present study was 45 and 147, with a mean of 80.9 mg% in males and 46.4 and 131 mg% with a mean of 90.5 mg% in females. The minimum and maximum values after one hour of oral glucose administration in the present study was 69 and 232 mg% with a mean of 120.3 mg% in males and 77.5 and 292 mg%, with a mean of 153.7 mg% in females. The minimum and maximum values after 2 hours of oral glucose administration in the present study was 46.4 and 270 mg% with a mean of 98.1 mg% in males and 69.2 and 273 mg%, with a mean of 145.8 mg% in females (Table 1).

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<th>Control</th>
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<td>Min</td>
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<tr>
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<td>1hr sample</td>
<td>102 84 137 106.2</td>
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<td>2hr sample</td>
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Table-1 Values of OGTT in controls and experimental group

According to the criteria proposed by National Diabetes Data Group (1979)\(^7\) and WHO (1985)\(^7\) patients with Abnormal Glucose tolerance test with a 2 hour levels ≥200 were diagnosed as diabetic. As per the WHO criteria 5 (10%) OLP subjects had 240-273 mg% of glucose in the blood after 2 hours of glucose administration of which 1 was male and 4 were females and 2 (5.9%) were in the keratotic type and 3 (18.8%) were in the non-keratotic type.

Among the 50 OLP subjects 5 (10%) were diabetic in the age range of 42-40 with a mean of 56.5 years. Among the 5 diabetics 2 females had keratotic type of OLP with an age range of 42-60 and mean of 51 years and 3 subjects had non keratotic type of OLP in which 1 was male and 2 were females with an age range of 53-60 and mean age of 56.5 years.

The above data were statistically analyzed with students ‘t’ test to find the ‘P’ value in comparison of FBS, 1 and 2 hour samples among OLP v/s controls and OLP diabetic cases v/s controls. The mean FBS values of controls was 86.6± 11.7 mg% whereas that of study group was 83.2 ± 22.4 mg%. The FBS value of control group appears higher than that of the study group, for 1 hour glucose tolerance values in controls was 107.8 ± 14.3 and 81.9 ± 22.4 mg% and in study group was 128.3 ± 45.3 and 109.5 ± 54.6 mg% with P value of 0.14 and 0.2 respectively which suggested that the results were statistically not significant (Table 2).

The mean FBS values of controls was 86.6 ± 11.7 mg% whereas that of OLP diabetics was 118.4 ± 11.7 mg% and 2 hours glucose tolerance values in controls was 107.8 ± 14.3 mg% and 81.9 ± 22.4 mg% and in OLP diabetics was 224.6 ± 45.2 mg% and 260.6 ± 13.1 mg%. All the values in OLP diabetics were higher than that of the control group, for FBS, 1 hour and 2 hours of glucose tolerance, with P value of <0.001 which suggested that the results were statistically highly significant (Table 2).
The incidence of diabetes mellitus increases as age advances. This finding is logical and consistent with the statement that the glucose tolerance decreases with age as stated by Christensen et al.(10)

In the present study there is high incidence of glucose intolerance in females (4 out of 5 OLP diabetics) which is comparable to 4 females out of 6 OLP diabetics of Bussell S.N. et al.(11) However, in the study of Lundstorm I.(2) incidence of diabetes mellitus was higher in men 50% then in women 18% but the difference was not statistically significant. The other authors have not mentioned the sex-wise incidence.

In the present study there was higher incidence of diabetes mellitus 3 out of 5 patients in non-keratotic OLP (Atrophic/Erosive group) which is similar to the prevalence study of Bagan et al (9) and dissimilar to Lundstorm I.(2) where 40% (4 out of 10) patients had diabetes mellitus in reticular group compared to 23% (7 of 30) in atrophic-erosive group.

Further studies are suggested with large samples of age, sex matched controls, individual keratotic, non-keratotic OLP, elaborative information about glucose tolerance in a larger group of patients with lichen planus and should this factor of disordered carbohydrate metabolism be found to play a significant role in the etiology of this muco-cutaneous disease, and these finding may be of importance in our search for a specific mode of treatment for lichen planus.

**Conclusion**

In conclusion the incidence of diabetes mellitus in OLP was 5 (10%). The mean age of OLP diabetics was 56.5 years which suggests a relationship between OLP and glucose intolerance in elderly individuals. There was one male and 4 female diabetic in OLP
subjects. Among the keratotic type of OLP 2 (5.9%) and non-keratotic type of OLP 3 (18.8%) were diabetics. The results are statistically highly significant with P value of <0.001 for FBS, 1 hour and 2 hour samples when OGTT values in OLP (OLP) diabetics v/s controls are compared.

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References

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