

Letters

Evaluation of Inter-incisor Distance as an Objective Criterion of the Severity of Oral Submucous Fibrosis in Karachi, Pakistan

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Oral submucous fibrosis (OSF) is a chronic, progressive, precancerous condition of the oral mucosa, predominantly seen in the Indian subcontinent and in people of South Asian origins [1-3]. The clinical picture is characterised by remission and relapses of vesicle formation, ulceration/stomatitis, blanching, pigmentation of the oral mucosa, alteration in salivation, intolerance to spices, burning sensation in the mouth, referred pain in the temporomandibular region, depapillation of the tongue, stiffness of the oral mucosa, progressive difficulty in opening the mouth and difficulty in phonation. Areca nut chewing has been identified as the most important risk factor [4, 5].

Here we discuss whether oral opening, measured as the distance between the incisal edges of mandibular and maxillary incisors, is a valid measure of the clinical severity of OSF based on a study involving 169 (63 males and 106 females) subjects with OSF seen during 1989 to 1993 at the Department of Oral and Maxillofacial Surgery, Jinnah Postgraduate Medical Centre in Karachi, Pakistan. The mean age of subjects was 30 years (S.D. 14). Most of the subjects belonged to Muhajirs, who are either migrants from India or their descendants. Areca nut chewing was the major habit, followed by the chewing of pan included with tobacco. The mean frequency of chewing per day was 7 per day (S.D. 6) and the mean duration of chewing was 10.2 years (S.D. 9.9). Smoking was practiced by less than one sixth of the subjects.

The extent of clinical disease in the oral cavity was assessed by dividing the intra-oral regions into eight anatomical sub-regions and looking for disease involvement in each: palate, posterior one third of the buccal mucosa, mid one third of the buccal mucosa, anterior one third of buccal mucosa, upper

labial mucosa, lower labial mucosa, tongue, and floor of mouth. This was further grouped into three categories:

- (1) involvement of one third or less of the oral cavity (if three or less of the above sites are involved);
- (2) involvement of one to two thirds of the oral cavity (if four to six intra-oral sites are involved);
- (3) involvement of more than two thirds of the oral cavity (if more than six intra-oral sites are involved).

The dentist also assessed the disease to be severe in half of the subjects and moderate in one third, based on overall clinical impressions. Objective assessment of disease extent in the mouth, based on the number of intra-oral sites affected, revealed involvement of one third or less in 40%, between one third to two thirds in 20% and more than two thirds in 40%.

The inter-incisor distance between the incisal edges of the maxillary and mandibular central incisors was measured using a simple ruler and expressed in millimeters. The mean inter-incisor distance in subjects was 16 mm; it was 10 mm or less in 29%, 11-20 mm in 48% and between 21 and 36 mm in 23%.

A biopsy of the lesion was performed in 74 willing subjects. The presence or absence and severity of epithelial dysplasia was determined by an experienced histopathologist based on modified Smith and Pindborg criteria [6]. Histologically, mild dysplasia was present in 28.3% ($n = 21$), moderate dysplasia in 10.8% ($n = 8$) and severe dysplasia in 9.5% ($n = 7$).

The association between inter-incisor distance and the clinical features of OSF was studied using the chi-square test. The correlation between the extent of anatomical disease in the oral cavity and mouth opening was tested by simple correlation analysis. Table 1 reveals the association of mouth opening (measured as inter-incisor distance) with

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Received 4 Dec. 1995; provisionally accepted 20 Dec. 1995; revised manuscript received 12 Feb. 1996.

Table 1. Association of inter-incisor distance with other clinical features of OSF

Clinical sign		n*	Inter-incisor distance			Chi-square	P value
			< 10 mm	11–20 mm	> 20 mm		
Burning sensation	No	96	19	54	23	9.55	< 0.01
	Yes	68	28	25	15		
Referred pain	No	71	11	42	18	12.09	< 0.005
	Yes	95	38	37	20		
Intolerance to spices	No	54	9	31	14	6.42	< 0.05
	Yes	112	40	48	24		
Ulcer	No	136	32	72	32	11.34	< 0.005
	Yes	32	17	9	6		
Vesicles	No	132	37	63	32	0.98	0.62
	Yes	35	12	17	6		
Stomatitis	No	139	34	73	32	7.98	< 0.05
	Yes	26	13	7	6		
Colour of oral mucosa							
Normal		4	1	0	3	8.38	0.21
Blanched		65	14	36	15		
White		95	33	43	19		
Marble		5	1	2	2		
Oral pigmentation	No	132	39	66	27	1.71	0.42
	Yes	36	10	15	11		
Tongue papillae	Normal	77	5	46	26	39.09	< 0.0001
	Partly depapillated	37	21	12	4		
	Completely depapillated	53	23	22	8		
Tongue mobility							
Normal		113	23	60	30	21.67	< 0.005
Partly fixed		48	21	20	7		
Totally fixed		8	6	1	1		
Clinical feel							
Normal		2	0	1	1	5.89	0.43
Leathery		66	22	29	15		
Band		49	9	27	13		
Leathery and band		51	18	24	9		
Patient disease recall							
2 or less years		75	19	32	24	9.59	0.14
3–5 years		31	11	15	5		
6–10 years		20	7	11	2		
More than 10 years		14	7	6	1		
Dentist's assessment of disease							
Mild		25	0	0	25	159.40	< 0.0001
Moderate		60	0	47	13		
Severe		83	49	34	0		
Intra-oral extent of OSF							
1/3 or less		68	5	39	24	29.39	< 0.0001
2/3 or less		34	13	13	8		
>2/3		67	31	29	7		
Dysplasia							
Nil		38	14	14	10	14.28	< 0.05
Mild		21	6	13	2		
Moderate		8	0	5	3		
Severe		7	3	0	4		

* Total number may not add to 169 due to missing values.

clinical symptoms and signs. It was significantly associated with intra-oral extent of submucous fibrosis ($P < 0.0001$), and the dentist's assessment of disease severity ($P < 0.0001$). It was also associated with the presence of symptoms like burning sensation ($P < 0.01$), referred pain ($P < 0.005$), intolerance to spices ($P < 0.05$), and signs like ulcers ($P < 0.005$), stomatitis ($P < 0.05$), atrophy of tongue papillae ($P < 0.0001$) and reduced tongue mobility ($P < 0.005$) and dysplasia ($P < 0.05$).

The correlation between the number of intra-oral sites involved and mouth opening is shown in Fig. 1. There is a

significantly negative correlation with intra-oral disease extent as expressed by the number of sub-sites involved (Pearson correlation coefficient 0.504, $P < 0.0001$). The mean inter-incisor distances were 19.8 mm (S.D. 5.8) in those with one third or less involvement of the oral cavity, 16.1 mm (S.D. 7.2) in those with two thirds or less involvement and 12.3 mm (S.D. 7.3) in those with more than two thirds involvement ($P < 0.0001$).

The major aim of this study was to evaluate oral opening, measured as inter-incisor distance, as a criterion to assess the severity of OSF so that it could be used as an outcome

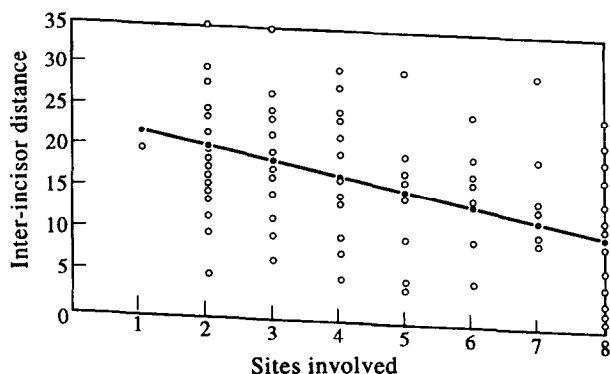


Fig. 1. Correlation between inter-incisor distance and extent of intra-oral site involvement of oral submucous fibrosis.

measure for the effect of interventions in OSF. Warnakulasuriya, evaluating several clinical criteria, remarked on the possible role of mouth opening in the assessment of progression of OSF [7]. A number of disease related factors, such as stiffness of the oral mucosa, submucosal bands, submucosal collagen deposits extending deep to muscle, intra-oral location and extent of disease, pain and exacerbation of ulcers may contribute to the difficulty in opening the mouth. The present investigation establishes that inter-incisor distance is significantly associated with several disease related factors and correlates significantly with the extent of intra-oral disease involvement.

It progressively reduced as more intra-oral sites were involved with the disease process. It also correlated well with the clinician's overall assessment of the disease severity based on several clinical criteria.

The observations in this study suggest that inter-incisor distance may be used as an outcome measure of response to intervention. It is less likely to be affected by observer bias

than other criteria used in the physical examination relevant to OSF. The distance between the incisal edges of the maxillary and mandibular central incisors could be measured and recorded with a high degree of precision. On the other hand, assessment of severity of disease in terms of symptoms, intra-oral extent of disease and histology are likely to suffer from observer and reporting biases. However, inter-incisor distance should be evaluated as an objective measure for OSF severity in different settings, particularly in population-based studies and intervention studies. Further studies are needed to determine the repeatability and usefulness of this parameter as a marker of progression of OSF.

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Acknowledgements—The authors gratefully acknowledge the constructive comments on a draft version of this communication by Dr D.M. Parkin and Mr R. Black at the IARC, Lyon, France and thank Mrs E. Bayle for preparing the manuscript.