

# Evaluation of Oral Hygiene Status and Periodontal Health in Mentally Retarded Subjects with or without Down's Syndrome in Comparison with Normal Healthy Individuals

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## ABSTRACT

**AIM:** The aim of the study was to assess the oral hygiene status and periodontal status of Mentally Retarded, Down's syndrome and normal subjects.

**MATERIAL AND METHODS:** The study was undertaken at OPPORTUNITY SCHOOL at Vepery, Chennai, India. 150 subjects were selected. Among them 100 were Mentally Retarded, 50 were Down's Syndrome subjects. 50 healthy normal subjects were selected (Students from Madha School, Chennai, India) for comparison. All were screened for oral hygiene and periodontal status by OHI-S and CPITN index. Statistical analysis was done by Pearson correlation coefficient.

**RESULTS AND CONCLUSION:** The results showed that the Mentally Retarded and Down's Syndrome subjects had decreased prevalence rate of periodontitis.

**Keywords :** Oral Hygiene, Periodontal, Mentally Retarded, Down Syndrome

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## INTRODUCTION

The major dental health problem in Mentally Retarded (M.R) children and Down's Syndrome (D.S) subjects owing to their poor propensity towards maintenance of oral hygiene lead to development of periodontal disease, which may be attributed to the lack of motivation and manual dexterity for achieving the standard of oral hygiene. Epidemiological studies on comparing M.R group with D.S group (Institutionalised) and the D.S (at home), elucidated that the D.S group (Institutionalised) had more severity of periodontal disease.

This enunciates deliberately that an environmental factor elicits the systemic factor of this syndrome to increase the susceptibility of the D.S Subjects to Periodontal Disease (1-4).

## AIM

- To assess the oral hygiene status and periodontal status of Mentally Challenged, Down's syndrome patients and to compare them with normal subjects.

## MATERIALS AND METHODS

### Study design

150 Mentally Retarded subjects and 50



Figure 1: Armamentarium



Figure 2: mentally retarded (M) subject

healthy individuals were included into the study. From the medical records we segregated the MR subjects and the DS subjects (21 Trisomy). Among 150 subjects, 100 were M.R patients, 50 were diagnosed as Down's Syndrome

- Three groups of study subjects were
  - ♦ **Group A** - 100 Mentally Retarded Subjects
  - ♦ **Group B** - 50 Down's Syndrome subjects
  - ♦ **Group C** - 50 Healthy subjects (Students from Madha School, Chennai, India)

*Inclusion Criteria*

- The students of Opportunity School, at Vepery, Chennai, India all whom were Mentally Challenged.

*Exclusion Criteria*

- Subjects who have undergone periodontal therapy and taken antibiotics in the past 6 months (5)

*Armamentarium*

- Dental Mouth Mirror
- Dental Explorer
- CPITN Probe
- William's Probe
- Tweezer
- Peizo electric scaler Unit with tips

Routine oral examination was carried out by assessing Oral Hygiene Status (OHI-S Index), and Periodontal Status (CPITN Index). Both the indices were recorded at baseline, 3 & 6 months interval after phase I therapy.

**RESULTS**

- In this study, the selected patients were subjected to the clinical examination by assessing baseline oral hygiene status (OHI-S) & periodontal health (CPITN Index)
- After phase I therapy was completed, probing depth values were measured after 3 and 6 months interval.
- Statistical analysis was done by using Pearson's Correlation Coefficient and the tabulated results showed a statistical significance between all the parameters [Tables 1&2].
- The results revealed that the disabled children had reduced probing depth values and less prevalence of periodontitis regardless of their poor predilection perceptive.



Figure 3: down's syndrome (DS) subject



Figure 4: calculus deposits and gingival inflammation in DS subject



Figure 5: pocket depth measured using cpitn probe

**Table 1: Oral hygiene index-simplified [OHI-S]**

SCORE OHI-S	SUBJECTS					
	M.R (Gp A)		DS ( Gp B)		NORMAL( GP C)	
	Number of subjects [n=100]	%	Number of subjects [n=50]	%	Number of subjects [n=50]	%
GOOD	20	20%	25	50%	27	54.0%
FAIR	61	61%	17	8.5%	22	44.0%
POOR	19	19%	8	16%	1	2.0%

**Table 2: Cpitn Index – all sextants involved**

SCORE	SUBJECTS					
	M.R (Gp A)		DS ( Gp B)		NORMAL( GP C)	
	[n=100]	%	[n=50]	%	[n=50]	%
0	6	6%	15	30%	13	26%
1	34	34%	23	46%	35	70%
2	50	50%	7	14%	2	4%
3	7	7%	3	6%	0	-
4	3	3%	2	4%	0	-

**DISCUSSION**

In this study, the disabled comprising of D.S and M.R. subjects of opportunity school at Vepery, Chennai , India were chosen as study group. Whereas the normal subjects were chosen among students of Madha School, Chennai, India.

Periodontal disease was found to be common among D.S and M.R subjects due to their incapacity to understand to grasp and follow the methods of maintenance of oral hygiene advocated by the professionals along with lowered host immune response.

In previous studies by Johnson N.P et al 1963(6) found the high prevalence rate of periodontitis among the Down's syndrome subjects but the oral hygiene status was not examined. Only the periodontal status was examined using probing depths and CPITN Index was not used. In our study CPITN Index has been used as it gave more accurate prevalence regarding gingivitis and periodontitis in a community study rather than using only probing depth

as criteria.

Another study by Orner. G. et al 1972 (7) found high incidence of periodontitis among the Down's syndrome subjects. Here, the periodontal status was examined using Russel's periodontal index and oral hygiene status was not examined. Russell's index might not have given an appropriate value towards a community study over a period of time. Hence in the present study CPITN index was used for the enhanced version of the results.

In previous studies, only the Down's syndrome subjects have been analyzed and Mentally retarded children have not been considered. Similarly the oral hygiene status have not been considered and no oral health education programme was conducted to improve the oral hygiene maintenance (8-10).

In the present study MR, DS patients were examined and compared with normal subjects by using CPITN Index and OHI-S. First the baseline value is recorded by using CPITN Index. Phase I periodontal therapy was done for MR

and DS subjects. Then repeated oral hygiene instructions were reinforced to the MR and DS subjects. Then the probing depth was measured using CPITN probe and Oral Hygiene Status was measured using OHI-S in 3 and 6 months interval after phase I periodontal therapy. The results obtained show a less prevalence rate of periodontitis among the MR and DS subjects and an improved oral hygiene status despite their poor propensity towards oral hygiene maintenance. The normal children were given oral hygiene instructions only and for them also OHI-S and CPITN recorded at 3 and 6 months interval. In that group also there was a reduction in the prevalence of gingivitis rather improvement in oral health. This was similar to the studies done by Jhonson *et al* ,Orner *et al* , Modder *et al* (6,7,9).

Other immune defects associated with periodontitis in DS like lymphocyte dysfunction and altered antibody production can also be determined. Inflammatory mediators (prostaglandin E2 and leukotriene B4) and degrading enzymes (matrix metalloproteinase-9) were increased in gingival crevicular fluid from patients with DS. The role of the IL-1 family of proinflammatory cytokines in the pathogenesis of periodontitis is well documented (11-13).

IL-1a and IL-1b are involved in initiating and propagating immune and inflammatory reactions.. DS is associated with immune deficiencies and host response impairment chromosome 21 Several proteins like superoxide dismutase (SOD), carbonyl reductase (NADPH) and integrin beta-2 (CD18) (2, 14, 15). Increased SOD and NADPH production is associated with increased oxidative stress and tissue injury in DS individuals. This leads to virulent periodontopathic microbial species to colonize their subgingival plaque. The end result of these inflammatory induced changes would be the loss and destruction of the periodontium and eventually tooth loss.

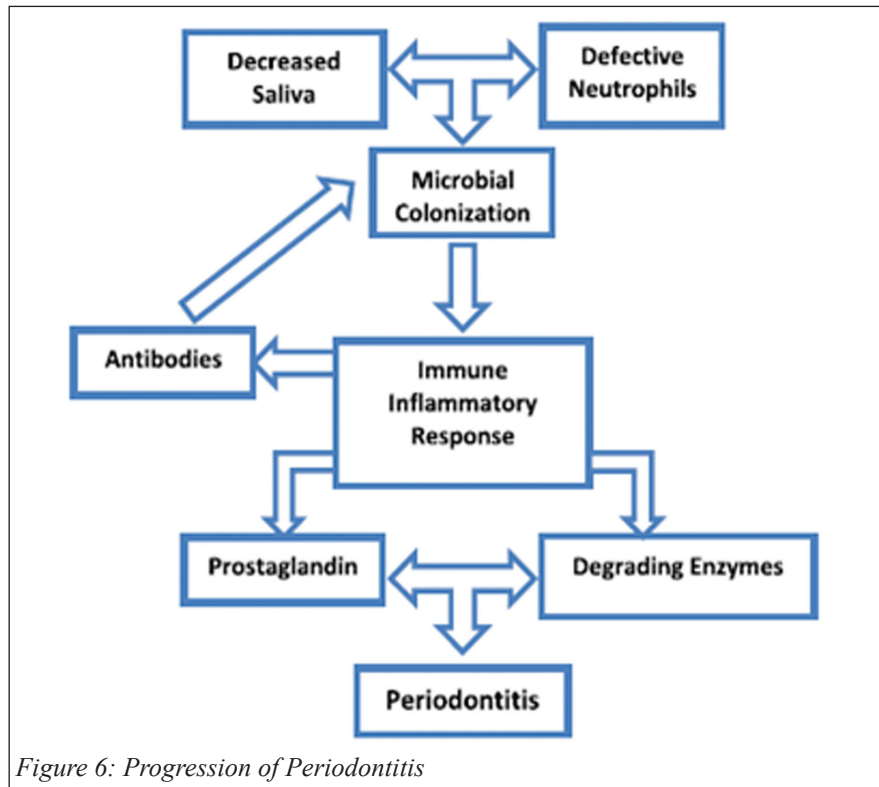


Figure 6: Progression of Periodontitis

But in our study the microbial analysis and the immunological profile were not considered. Yet future studies with large sample size can be carried out along with microbiological studies like culturing, polymerase chain reaction [PCR] and checkerboard DND-DNA hybridization that revealed, the important periodontopathic bacteria like *Porphyromonas gingivalis* and *Tannerella forsythensis* in DS individuals (2, 16-18). Neutrophil function studies mainly focused on neutrophil chemotaxis measured by the Boyden chamber method showed the reduced chemotactic activity in the D.S individuals (14, 19, 20).

### SUMMARY AND CONCLUSION

The individuals with Down's syndrome (DS) have an increased prevalence of periodontal disease compared with otherwise normal and MR patients. In this study it was found that the disabled children have good awareness of maintaining oral hygiene and periodontal health despite their poor capability of understanding. Further controlled studies including

large number of disabled are needed to assess the effectiveness of different preventive dental programs in preventing the progression of periodontitis in DS and MR to bring them on par with normal individuals.

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