

Oral Health Status of Children with Congenital Heart Disease and the Awareness, Attitude and Knowledge of their Parents

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The oral health status of children with congenital heart diseases and the parental awareness on maintaining good oral health and attitude towards preventive dental health measures were evaluated. A total of 170 children between the age group of 1-16yrs belonging to both genders, with the history of congenital heart disease from Sree Chitra Tirunal Institute of Medical Science and Technology, Thiruvananthapuram and Narayana Hrudayalaya Institute of Medical Sciences, Bangalore were examined. Oral lesions and caries experience were recorded using modified WHO oral health assessment form. Oral hygiene of the children with congenital heart disease was found to be poor with tongue coating (50.6%), plaque (41.8%), calculus (35.3%), and caries (42.4%). Parental awareness on the importance of maintaining good oral hygiene, preventive dentistry, medicinal decay and its systemic effects has been found to be very poor. Dentistry should give priority to patients whose general health may be put at risk by poor dental health. Closer cooperation between Pediatrician, Pediatric Cardiologists and Pediatric Dentists could help improve dental care for these children.

Keywords: Congenital heart disease, oral health, awareness, attitude, parents, children
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INTRODUCTION

The March of Dimes estimates that over one million children are born with congenital heart disease worldwide.¹ Dental care of the children with congenital heart disease has been neglected. A preoccupation with the principal medical condition often results in neglect of other facets of the child's health. The motivation of parents and children is the biggest difficulty for the treatment, particularly among special patients, where the systemic problem is often the main concern of the guardian. Professional persistence and certainty are necessary to educate such patients as to the importance of good oral hygiene in ensuring oral

health and the health of the patient as a whole. Such children often present with a dental emergency that—because of the associated medical problems—can be difficult to manage both medically and dentally.²

In addition there is the additional morbidity, often considerable, associated with pain and infection in the mouths of children afflicted with recurrent problems associated with their underlying cardiac disorder. Oral health can be a window of infectivity for the children with congenital heart disease. A detailed knowledge of the dental and oral conditions of such children is essential if preventive care is to be directed effectively.³

MATERIAL AND METHODS

A total of 170 children between the age group of 1-16yrs belonging to both the genders, who are diagnosed with congenital heart disease from Sree Chitra Tirunal Institute of Medical Science and Technology, Thiruvananthapuram, Kerala, India and Narayana Hrudayalaya Institute of Medical Sciences, Bangalore, Karnataka, India were examined. Prior consent was obtained from the parents and respective hospital authorities for examination. Those children, who were unconscious, severely ill, uncooperative, mentally compromised and with associated syndromes, were excluded from the study.

Recording the oral health status

The oral cavity of the children were examined and recorded for oral lesions, oral hygiene, caries experience using a modified WHO oral health assessment form (1997).⁴

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Gingival status was recorded by modified gingival index given by Lobene *et al* 1986.⁵ The children with congenital heart disease were examined visually at the hospital under a good light source and using a sterile mouth mirror. A questionnaire was distributed for assessing the parental awareness on infective endocarditis and attitude towards preventive health behavior. Recorded data were statistically analyzed using Chi-Square test.

RESULTS

In the present study out of 170 children with congenital heart disease, there were 76 (44.7%) cyanotic and 94 (55.3%) with acyanotic heart diseases.

Relevant oral findings include incompetent lips (8.8%), mouth breathing (11.2%), halitosis (1.76%), cyanosis of the tongue and lip (39.4%), glossitis (25.3%), bald tongue (17.1%), tongue coating (50.6%), plaque (41.8%), calculus (35.3%), stains (22.9%), caries (42.4%) missing teeth due to caries (14.15%), root stumps (3.95%) and malocclusion (29.4%) respectively. Majority of the patients showed grade I enamel hypoplasia (56.5%) and moderate gingival inflammation (34.11%).

There were no relevant extra oral finding except for one cyanotic case with allergic pruritus.

Systemic findings recorded include anorexia (21.8%), vomiting (12.4%), nausea (11%), pallor (19.75%), dyspnea (14.9%), epistaxis (11%), weakness (51%), engorged vessels of the neck (2.9%), and fatigue on exertion (78.15%). A family history of congenital heart disease was found in about 4.7% of the children. A positive history of pharyngeal infection was observed in only 10% in the present study. Generalized cyanosis and clubbing were seen more in cyanotic patients (56% and 41%) whereas in acyanotic patients it was less (16% and 17% respectively). Head ache was reported more among acyanotic patients (40.4%) compared to cyanotic patients (25%).

Parental awareness on the importance of maintaining good oral hygiene, its systemic effect and about preventive dentistry has been evaluated. It has been found to be very poor. Majority of the patients were unaware of the importance of maintaining a good oral hygiene (85.3%).

DISCUSSION

Although infective endocarditis is a rare condition in the population in general, it continues to be a serious complication, mainly in patients who possess susceptible cardiac conditions.⁶ The relationship between oral microorganisms and the development of infective endocarditis is well known. A detailed knowledge of the dental and oral conditions of such children is essential if preventive care is to be directed effectively.⁷

Understanding should lead to modification of current techniques and management strategies, all with the ultimate goal of improving the patient's quality of life.

Choudhury (1992),⁸ from Chandigarh, India, studied clinical data from 186 patients with infective endocarditis retrospectively and found that congenital heart disease was the

second most underlying heart lesion next to rheumatic heart disease.

It has been observed that 29.41% of the patients showed healthy gingiva with no inflammation, while 26.47% had mild, 34.11% moderate and 10% showed severe gingival inflammation. Das M (1997)⁹ noted that children with congenital heart disease had more severe gingivitis and increased plaque accumulation as compared to normal children.

Plaque accumulation was found in 41.8% while 35.3% showed presence of calculus. Presence of halitosis (1.76%) and tongue coating (50.6%) were presumed to be because of the poor oral hygiene. Bayliss R (1983)¹⁰ had reported that the causative microorganism for infective endocarditis in more than 60% of the patients with positive hemoculture are streptococci while Knox KW and Hunter (1991)¹¹ found that among all the microorganism that cause endocarditis, *viridans streptococci* represents 50%, especially *Streptococcus sanguis*, *Streptococcus mitior* and *Streptococcus mutans*. This emphasizes the importance of maintaining a good oral hygiene and a need for the parental awareness on importance of tongue cleaning during brushing due to an increased level of *streptococcus mutans*, which is one of the most predominant microorganisms in the plaque microflora.¹²

Glossitis (25.3%) and bald tongue (17.1%), which was present, can be attributed to the underlying nutritional problems. A white thick coating over the tongue which resembled candidiasis was noticed in 10% of the patients. Further investigation is recommended to confirm the diagnosis.

We followed World Health Organization criteria to assess enamel hypoplasia⁴ and has been observed that 56.5%, were reported normal. Berger (1978)¹³ reported that children with congenital heart diseases had higher levels of enamel hypoplasia and dental caries compared with normal healthy children.

Dental caries has been found in 47.4% of the children, which is quite alarming. It could be the result of predisposing factors such as increased susceptibility to the development of enamel defects, to the chronic use of sugared medicines, and to the high consumption of sweets as compensation. Hayes PA and Ferules J (2001)¹⁴ report that of major significance is that untreated caries can be a contra-indication for heart surgery. In children with complex heart disease, other problems often appear that may jeopardize dental health. Anorexia (21.8%) was also found in this study other than vomiting (12.4%) and nausea (11.2%). Stecksen-Blicks (2004)¹⁵ has reported difficulties in nutrition like vomiting and nausea. To compensate for this, feeds are frequent and night meals are often necessary which may further neglect the oral hygiene.

Conjunctival petechiae was observed in 30.6% and a minor percentage (1.8%) of children had petechiae of the extremities. Ajit Auluck (2004)¹⁶ reveals that excessive bleeding can occur in patients with congenital heart patients for reasons other than the use of acetylsalicylic acid and anticoagulant therapy. Perloff (1991)¹⁷ reports that hematologic abnormalities can be thrombocytopenia, accelerated

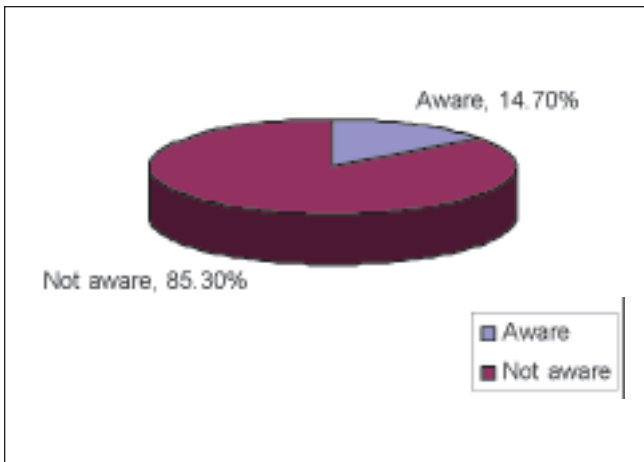


Figure 1. Parental awareness on infective endocarditis.

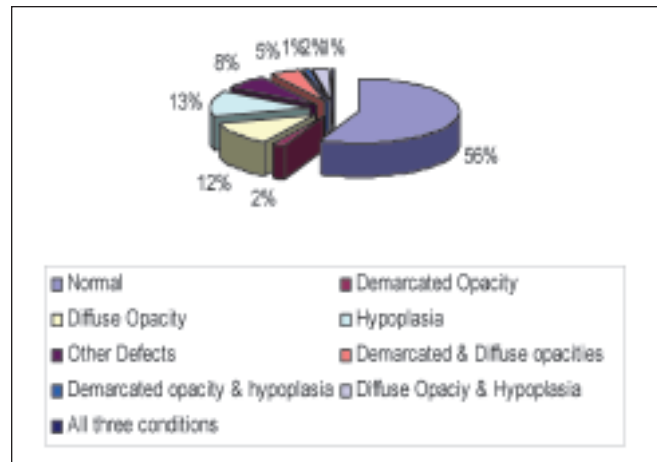


Figure 3. Enamel Hypoplasia

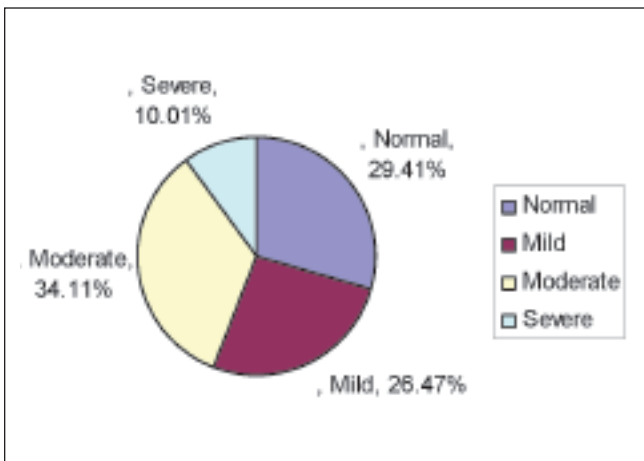


Figure 2. Gingival Status (Based on the criteria given by Lobene et al 1986)⁵

found to be alarming that 85.3% were not aware about the importance of maintaining good oral hygiene. Da Silva DB and Souza IPR (2002)¹⁸ found that the knowledge and attitude of the parents and guardians towards maintaining good health and its effect on cardiac tissues in these children were poor.

In children with medical disabilities, general health may be further jeopardize if they develop dental disease and the need for dental care itself constitutes a risk. Medically compromised children and adolescents should have access to specialist dental care with a system of shared care between primary and secondary dental providers. We propose that a dental appointment be scheduled as part of the medical re-evaluation protocol for children in this category. Such a system would provide immediate access to information pertaining to medical and dental treatment needs and facilitate pediatric medical professionals and the public know when and how to seek specialist care.

CONCLUSION

- Oral health status of children with congenital heart disease was not satisfactory in the current study.
- Parents were unaware that poor oral status can be a predisposing factor for infective endocarditis.

fibrinolysis or decreased production of coagulation factors leading to increased prothrombin time and thromboplastin time.

Guardians' knowledge about maintaining good oral hygiene in relation with infective endocarditis and the awareness on medicinal caries were recorded and it was

Table 1. Oral Findings:

Clinical Features	Number of patients	Percentage
Incompetent Lips	15	8.8%
Mouth breathing habit	19	11.2%
Cyanosis of Tongue and lip	67	39.4%
Glossitis	43	25.3%
Bald tongue	29	17.1%
Tongue coating	86	50.6%
Candidiasis like lesion	17	10.0%
Dental Plaque	71	41.8%
Dental Calculus	60	35.3%
Extrinsic stains on the teeth	39	22.9%
Dental Caries	72	42.4%
Malocclusion	50	29.4%

Table 2. Other Systemic Findings:

Clinical Features	Number of patients	Percentage
Anorexia	37	21.8%
Vomiting	21	12.4%
Nausea	19	11.2%
Dyspnea	29	17.1%
Weakness	102	60
Fatigue on exertion	132	77.6%
Pallor	38	22.4%
Head ache	57	33.5%
Cyanosis	71	41.8%
Clubbing	57	34%
Epistaxis	19	11.2%

- Parental attitude towards specialized dental treatment or maintaining good oral health status was very minimal.

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