

Survey On Parental Awareness And Oral Health Of Children With Congenital Heart Disease-A Multicentric Study In Southern India

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Abstract:

Background: The oral health aspect of a child with Congenital Heart Disease (CHD) is often the last in the minds of the treating army of health professionals. The survival of these children has been successful due to enhanced treatments and surgeries in the field of pediatric cardiology. However, the complexity of the treatments given to these children and morbidity results in increased incidence of dental health conditions. The risk of recurrent bacteremia even by normal brushing of teeth and consequent infective endocarditis can have long term complications for them. There are few published studies about oral health status in Southern India.

Methodology: We conducted a survey of all children with congenital heart diseases admitted to two large premier cardiac care institutes of southern India, SCTIMST, Thiruvananthapuram and NHIMS, Bangalore. Data was recorded in modified WHO form.

Results: Parental awareness on following good oral hygiene (14.9%), medicinal caries (6.5%) and its effects on the body including infective endocarditis were very minimal. Oral health status in general, of the children with congenital heart disease was found to be poor with tongue coating (50.8%), plaque (41.9%), calculus (35.1%), and caries (42.3%).

Conclusion: Dentistry should give more importance to patients with systemic condition who are at risk because of dental issues. A very proximate collaboration among Cardiologists, Pediatric Cardiologists, Pediatricians and Pediatric dentists will definitely yield good treatment outcome and better life for these medically compromised children.

Keywords: Parental awareness, Oral health status, Congenital heart disease, Medicinal caries, Children

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I. Introduction

Congenital heart disease (CHD) a structural anomaly of the heart and great vessels, is the most common of all major birth defects¹. A preoccupation with the primary medical condition often results in neglect of other facets of the child's health. The risk of developing infective endocarditis from dental bacteremia induced by even normal brushing in chronic poor dental health is a matter of concern^{2,3}. There is a big lacuna in awareness of parents in the importance of preventive dental care and on medicinal caries in such patients³. Hence this study was conducted.

II. Materials and Methods

We conducted a cross sectional survey at Sree Chitra Thirunal Institute of Medical Science and Technology Thiruvananthapuram, Kerala State and Narayana Hrudyalaya Institute of Medical Sciences, Bangalore, Karnataka State. We recruited a total of 170 children aged between 1-16yrs of age of who were diagnosed with congenital heart disease and undergoing treatment and belonging to either gender were included in the study.

Those children who were severely ill, uncooperative, having comorbid severe mental health compromising dental examination were excluded from the study. The informed consent of the parents was obtained prior to the survey. The institutional ethics committee approved the study.

The principal investigator examined oral cavity for oral lesions, oral hygiene, caries experience of all the children with CHD who met the above criteria. Data including parental awareness on bacteremia, endocarditis, medicinal caries and oral health status were collected using modified WHO form. We used Modified Gingival Index by Lobene RR et al for gingival status. Chi square test was done for analysis of data.

III Results

A total of 170 children participated in our study. The distribution based on the nature of CHD were 94 (55.3%) and 76 (44.7%) acyanotic and cyanotic patients respectively. Parental awareness on maintaining good oral health status and infective endocarditis was found to be very poor (14.7%). Only 6.5% of the parent group were aware of medicinal caries.

Dental plaque and calculus were reported on 41.8% and 35.3% respectively. Dental caries was noticed on 42.4% in the study. Halitosis was present on 1.76% wherein 50.6% had tongue coating and 10% had candida like lesions. 69% of the children brushed their teeth only once. 5.3% of the children never practiced brushing.

Figure No 1: Parental awareness on Good oral health status and Infective Endocarditis

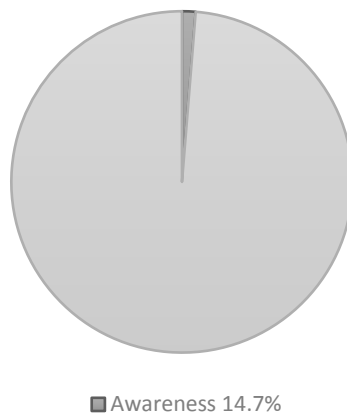
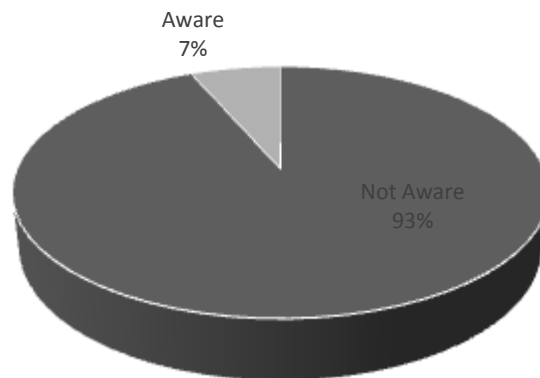
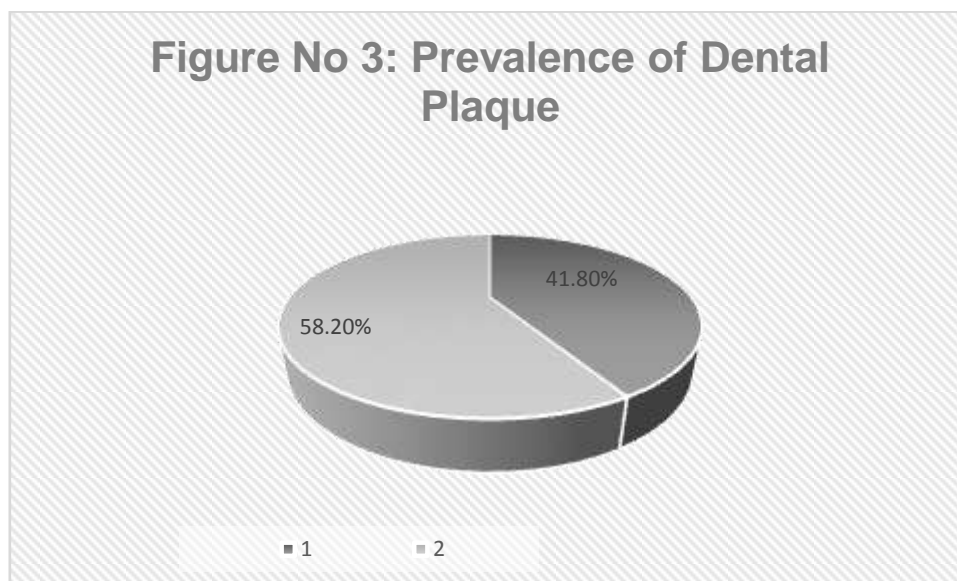


Figure No 2: Parental awareness about Medicinal Caries





The gingival inflammation in our sample group was found to be normal in 29.41% and 26.47%, 34.11% and 10% showed mild, moderate and severe inflammation respectively.

IV Discussion

In our survey, the amount of plaque accumulation in CHD patients were found to be 41.8% while 35.3% showed presence of calculus. According to the study done by Sethi et al,⁴ the mean dmft score and Calculus Index were found to be significantly higher in cyanotic CHD group compared to acyanotic CHD group and the prevalence of caries, Debris Index, Calculus Index, and Oral Health Index were found to be increasing with increasing age. They concluded that the overall, the oral health status of the children with CHD was found to be poor in this study.

The poor oral health status of children with CHD are due to many factors like increased prevalence of developmental oral defects, such as enamel hypoplasia, malocclusion which may lead to poor oral hygiene maintenance leading to more plaque, calculus and debris. In the present study few patients presented with halitosis (1.76%) and tongue coating (50.8%). Particularly disappointing was that a large number of children (69%) brushed their teeth only once a day or never practised brushing (5.3%) A study by Nath et al 2008, demonstrated that only 8% of the parents were aware of the importance of good oro-dental hygiene and the need for IE prophylaxis⁵

It has been observed that 30.26% of the cyanotic patients showed normal gingiva with no inflammation, 21.01% mild, 34.22% moderate and 14.47% showed severe gingival inflammation where as in acyanotic group it was 28.72%, 30.85%, 34.05% and 6.38% respectively. As study done by Hunter² suggested that levels of gingival inflammation in the cardiac group represent a significant amount of damaged and ulcerated tissue, which may allow ingress of oral bacteria leading to bacteraemia. A detailed knowledge of the dental and oral conditions of such children is essential if preventive care is to be directed effectively. Understanding should lead to modification of current brushing techniques and management strategies, all with the ultimate goal of improving the patient's quality of life in CHD patients.

Glossitis (25.3%) and bald tongue (17.1%), which were present in our study, 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. A study by Miguel et al, found that 54% of the CHD patient had candidiasis. This could be the sequelae of long-term use of antibiotic therapy.

The prevalence of dental caries in our study has been found to be 47.4% of the children, which is quite alarming. Many factors may predispose children with CHD to develop caries during early childhood. Developmental enamel disturbances of the tooth enamel and hypomineralization defects, in particular, make teeth more vulnerable to early childhood caries and also the chronic use of sugared medicines, and to the high consumption of sweets as compensation. Particularly disappointing was that a large number of children (69%) brushed their teeth only once a day or never practised brushing (5.3%). A study by Nath et al 2008, demonstrated that only 8% of the parents were aware of the importance of good oro-dental hygiene and the need for IE prophylaxis³. Hayes PA and Ferules J (2001) report that of major significance is that untreated caries can be a contraindication for heart surgery⁴.

Children with major CHD are at risk for developing endocarditis. Infective endocarditis(IE) is a potentially life-threatening condition despite several advances in its diagnosis and treatment. There are very few studies carried out regarding IE awareness and most of the studies showed that parental knowledge of IE prophylaxis is limited. Current study showed that parental awareness on maintaining good oral health status and infective endocarditis was as very low as 14.70%. Da Silva DB and Souza IPR (2002)³ found that the knowledge and attitude of the parents and guardians towards maintaining good health and its effect on cardiac issues in these children were poor. A study by Patel in 2021⁶, found that only 43 % parents were aware of the importance of maintaining good oral hygiene in patients with CHD.

The lack of awareness about good oral hygiene and IE prophylaxis could be because of illiteracy, poor socioeconomic status or ignorance among parents or a lack of knowledge on the subject by medical personnel. Hence, sincere effort has to be made by pediatricians and pediatric cardiologists to educate parents on the importance of good oral hygiene and the need for IE prophylaxis in children with heart disease. Education via pamphlets and repeated counselling by dentists about maintaining good oral hygiene and IE prophylaxis at each clinic visit can help in building awareness among parents and families.

Oral liquid medications (syrups) are widely prescribed in children for better compliance. Predisposing factors of liquid medications include low pH, high viscosity, increased frequency of consumption especially during bedtime, reduction in salivary flow and excessive sugar content which may lead to caries and erosion in teeth. When used routinely over long time, this can make patients more susceptible to dental caries and dental erosion. The child's oral health is often neglected due to the preoccupation of the parent with the child's medical problem. Rarely physicians are also unaware of the high sugar content of medications.

According to a study done by Neves et al,⁸ only 65.1% of these parents brushed their children's teeth after medication, only 18% of the parents performed oral hygiene practices after the medication, of whom 44.4% received previous instructions. Although, most of them do not brush teeth or rinse their children's mouth after taking medication. Current survey showed that only 6.5% of the study group was aware about medicinal caries. The result of study recommended that non-fermentable sweetening agents such as sorbitol or xylitol may be used as sweetening agents. It is suggested that pharmaceutical manufacturers should be encouraged to produce liquid medicines with sugar substitutes.

Present study showed that the overall oral health status of the children with CHD and the parental awareness were very poor. This may lead to recurrent dental infections which demands repeated dental interventions, delaying invasive cardiac procedures and surgeries.

By identifying the oral health problems in children with CHD, health care professionals could potentially implement reasonable and cost-effective preventive measures to address the problem in the early stages. Gaps in parental knowledge on the importance of maintaining good oral hygiene, bacteraemia, infective endocarditis and medicinal caries should be addressed with counselling.

V Conclusion

Parents of children with CHD need to be educated about the relation between oral health, medicinal caries and their relationship to infective endocarditis. The pediatric dental professional needs to maintain close liaison with the treating medical and surgical team of children with CHD.

Parental attitude towards specialized dental treatment or oral health status was very minimal, where parents were unaware that poor oral health status can be a predisposing factor for infective endocarditis. A large lacuna in the knowledge of medicinal caries was noted among parents and care takers. Keeping in mind the elevated anxiety level of the parents about their child's general health status, effective dental health programmes should be mandatory. Recommendations to maintain good oral health should be reinforced by the medical team in coordination with the Pediatric dentist.

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