Oral health status and treatment needs of children with congenital cardiac disease in Lagos, Nigeria

Agbelusi GA[1], Nwhator SO[1], Okoromah CN[3]
[1]Department of Preventive Dentistry
[2]Department of Paediatrics

Agbelusi GA, Nwhator SO, Okoromah CN: Oral health status and treatment needs of children with congenital cardiac disease in Lagos, Nigeria. Tanz Dent J 2007, 14 (2):68-71

Abstract
Introduction: Dental treatment for Children with congenital heart disease carries the risk of infective endocarditis. This paper aims to determine the oral health status and treatment needs of these children. **Study participants and methods:** All children with congenital heart disease attending the Paediatric Cardiology Clinic, Lagos University Teaching Hospital over three months were examined. Caries was diagnosed using the WHO criteria. Debris scores of Greene and Vermillion and CPI index were used. **Results:** Forty-one children (4 months -18 years, mean age 5.02 + 4.82) were seen. Four edentulous children were excluded from the analysis, the final study population was therefore 37, of which 78.4% were caries free. Fourteen (37.8%) had gingivitis, 2 (5.4%) had periodontitis while nineteen (51.4%) needed cause related periodontal therapy. The children had poor oral hygiene. **Conclusion:** The oral health of these children needs urgent attention. Parents/caregivers should be educated on the high standard of dental care.

Key words: Congenital heart disease, oral health status, caries, periodontitis, treatment needs.

Correspondence: Agbelusi GA, College of Medicine, University of Lagos, P.M.B. 12003, Lagos.

Introduction

Congenital heart disease exposes affected children to risk of developing infective endocarditis on undergoing dental treatment thus the recommended antibiotic prophylaxis for invasive dental procedures (1-3). They are at double risk because their neglected oral health could worsen their already compromised medical condition (4,5). The American Heart Association recommends regular dental care for such patients (6). Unfortunately, care-givers often view oral health as minor compared with the medical conditions of such children, they are busy caring for their medical condition and seldom see the need for adequate oral health care (7) with dire consequences (8). Despite the danger involved in managing the oral health of children with congenital heart disease, and the fact that these patients are being managed regularly in our environment, there is a complete absence of research into the oral health status of these patients in Africa.

Study participants and methods

Forty one children attending the Paediatric Cardiology Clinic of the Lagos University Teaching Hospital (old and new cases) between March and July 2003 were examined by a single examiner. Examiner-administered questionnaires were used to obtain biodata and general information for each child consisting of questions on, age, sex, previous dental visits, past dental treatment, occupation and educational background. The oral health knowledge, attitudes and practices of caregivers of the children were also included in the questionnaire while the children were examined.

Detailed oral examination of the children was done in a well-lit paediatric cardiologist's chair side room using natural daylight. Adequate precaution to prevent cross infection was taken by ensuring that sterile instruments were used for each child. Findings were recorded in a proforma included in the questionnaire.

Caries was diagnosed using the WHO criteria of 1997 (9). The Debris Index component of the Oral Hygiene Index score of Greene and Vermillion [1960] (10) and status codes 0, 1 and 2 component of the Community Periodontal Index (11) were used to assess the periodontal treatment needs of the children. Only codes 0-2 were considered because of the difficulty in separating periodontal pockets from normal deepened gingival crevice around partially erupted teeth. This is consistent with WHO provision (12). Diagnosis of periodontitis in these children was therefore made based on clinical appearance alone, with features such as bleeding on gentle probing and calculus given prominence rather than pocket depth measurements.

Data Analysis

Data was entered and analyzed using the Epi info version 6 (13). Associations and differences were said to be significant when $p < 0.05$.

Results

Forty-one children aged between 4 months and 18 years (mean age 5.02 + 4.82) were examined, 19 males (46.3%) and 22 females (53.7%). Four of the children were edentulous and were excluded from the analysis.

The cardiac lesions seen are listed in Table 1.

Table 1: Distribution of structural heart disease seen

Types of heart disease	No	%
Acyanotic congenital heart disease (ACHD)	7	17.1
Atrial septal defect (ASD)	3	7.3
Cardiomyopathy (CMP)	1	2.4
Endocardial cushion defect (ECD)	1	2.4
Single atrium (SA)	1	2.4
Teratology of fallot (ToF)	6	14.6
Ventricular septal defect (VSD)	17	41.6
Pulmonary stenosis	1	2.4
Endocardial cushion defect (ECD)	2	4.9
Acquired heart disease (AHD)	2	4.9
Total	41	100

Dental Caries

About 78.4% were caries –free (dmft / DMFT = 0) and caries prevalence of 21.6% (dmft/ DMFT > 1) was recorded.

Extractions

Two (5.4%) patients have had tooth extractions. During the period of study, three children (8.1%) needed extraction.

Amalgam filling

One (2.7%) patient has had Amalgam filling.

Toothache

Four patients complained of toothache.

Oral Hygiene Status

Fourteen (37.8%) children had gingivitis. Oral hygiene status and periodontal treatment needs is shown in Tables 2 and 3, respectively.

Table 2: Oral Cleanliness of subjects using Debris (plaque) score of Greene and Vermillion

Score	Male	Female	Total	%
0	1	4	5	13.5
1	3	10	13	35.1
2	10	5	15	40.6
3	3	1	4	10.8
Total	17	20	37	100

Others

Five (13.5%) children had malocclusion requiring orthodontic treatment. One patient (2.7%) had a cleft palate and one (2.7%) had severe hypoplastic teeth.

Table 3: CPITN scores of subjects according to sex

CPITN (Max)	Male	Female	Total	%
0	2	6	8	21.6
1	2	8	10	27.0
2	13	6	19	31.4
Total	17	20	37	100

CPI Scores

Eight patients (21.6%) had CPI code O, 10 (27%) had code 1, while 19 (51.4%) had CPI code 2.

Periodontal treatment needs

Nineteen (51.4%) of the children needed scaling and polishing.

Discussion

The likelihood of developing bacteraemia during dental manipulations (1-4) necessitates the need for prophylactic antibiotic cover to prevent the development of infective endocarditis in vulnerable patients.

Prevalence of dental caries seen in this study is low by WHO (14) standards corroborates studies done on children in the similar age group in Nigeria (15, 16). For children with congenital heart disease however, the level needs to be viewed with concern because it represents a source of pain and discomfort in children whose health is already compromised. It is therefore not acceptable though lower than the 28.3% - 39% from Western studies in a similar group of children (17 – 19).

Majority of the carious lesions seen in these children were untreated and the children are not likely to go for restorative/preventive treatment as an earlier study (20) has shown. In the earlier study, four (10.8%) of

the children complained of toothache and the parents did not do anything about it, while 2 (5.4%) have already had extractions.

It is noteworthy that caries in 6 of the 8 children with carious teeth affected primary teeth. Considering the age of the children (mean age 5.02 + 4.82 (sd)), caries active group were likely to develop more caries as they grow older, therefore there is an urgent need to educate caregivers on prevention of dental caries, the importance of regular dental care, and the consequences of neglect. The effectiveness of education is corroborated by a study (21) which found that an understanding of endocarditis risk improves compliance with prophylaxis.

The low level of dental treatment seen in these children corroborates studies done on children in similar age groups in Nigeria and it shows that the culture of regular dental care is clearly lacking in these children (15, 16). This is not surprising as studies from developed countries showed a similar trend (22).

The oral health of the children is poor considering the age group in question. It however corroborates findings on oral health status from studies on children in similar age group within the same locality (15, 16). The occurrence of gingivitis and calculus in this study population speaks of unacceptable neglect of oral health by parents/care-givers since poor oral hygiene, plaque accumulation and the subsequent gingival inflammation could lead to transient bacteraemias (23). The microorganisms could induce an autoimmune reaction that may lead to valvular scarring and calcifications with eventual mitral stenosis and aortic insufficiency (24).

Treatment involving tooth cleaning and in some cases orthodontic banding and debanding have to be done under prophylactic antibiotic cover (25).

Finally, the issue of antibiotic prophylaxis is becoming controversial and its usefulness being questioned (26). Other schools of thought have also expressed a concern that the widespread use of antibiotics might contribute to antibiotic resistance and allergic reactions (27).While the controversy lasts however, it is the opinion of the authors that except in cases where direct harm against the child could be proved, all children with congenital cardiac disease should be given prophylactic antibiotic cover prior to dental treatment when indicated.

Conclusion

The oral health of the children with congenital heart in this study is neglected and needs urgent attention. The children should receive regular preventive and restorative dental care. Parents and caregivers of these children should be educated on the high standard of dental care needed to prevent dental disease and its sequelae.

Recommendations

There should be active collaboration between the dental team and the cardiologists. . Dentists can play an important role in identifying people in need of primary prevention strategies for CVD as recommended by Glick and Greenberg (28).

References

1. Fowler VG, Durack DT. Infective endocarditis. Curr Opin Cardiol 1994;9:398-400.
2. Takeda S, Nakanishi T, Nakazawa M. A 28-year trend of infective endocarditis associated with congenital heart diseases: a single institute experience. Pediatr Int. 2005;47:392-6.
3. Balmer R, Bu'Lock FA The experiences with oral health and dental prevention of children with congenital heart disease. Cardiol Young. 2003;13:439-43.
4. Kohli V. Infective endocarditis. Indian J Pediatr. 2002;69:333-9.
5. Hobson P. The treatment of medically handicapped children. Int Dent J. 1980;30:6-13.
6. Prevention of Bacterial Endocarditis: Recommendations by the American HeartAssociation. Dajani A S, Taubert A K, Bolger A F, Ferrieri P, Shulman S T, Newburger J W, Pallasch T J, Gage Tommy W, Levison M E, Zuccaro G Jr. *Circulation.* 1997; 96:358-366.
7. Roberts GJ, Roberts IF. Dental disease in chronically sick children. Journal of Dentistry for children. 1981; 30:6-13.
8. Moore RS, Hobsen PA. Classification of medically handicapping conditions and the health risks they present in the dental care of children.
9. World Health Organization, Geneva (1997): Oral Health Survey, Basic Methods, 4th Ed. WHO Geneva. 1-9.
10. Greene JC, Vermillion JR. Oral hygiene index- a method of classifying oral hygiene status. J. Am. Dent. Assoc. 1960; 61:172&196;68:7 -13.
11. Cutress TW, Ainamo J, Sadoinfini J. The Community Periodontal Index of Treatment Needs (CPITN). Procedure for population groups and individuals. Int. Dent. J. 1987; 37:222–33.
12. Community Periodontal Index (CPI)..World Health Organization. Oral Health Surveys - Basic methods. 4th Edition. Geneva 1997, Pages 36 – 38.

13. Dean AG, Dean JA, Coulombier D. Epi Info, Version 6: a word processing, database, and statistics program for public health on IBM-compatible microcomputers. Centers for Disease Control and Prevention, Atlanta, Georgia, USA, 1995.

14. World Health Organization. DMFT levels at 12 years. Geneva. WHO, May 1994.

15. Adeniji OO. Oral Health status of 4 – 16 year – old Nigerian School Children in Lagos. Nig. Qt. J. Hosp. Med. 1999;7:36 – 8.

16. Sofola OO, Jeboda SO, Shaba OP. Caries prevalence in 4-16 year old school children in Southwest Nigeria. Odontostomatologie tropicale. 2004;108:19-22.

17. Busuttil Naudi A, Mooney G, El-Bahannasawy E, Vincent C, Wadhwa E, Robinson D, Welbury RR, Fung DE. The dental health and preventative habits of cardiac patients attending the Royal Hospital for Sick Children Glasgow. Eur Arch Paediatr Dent. 2006;7:23-30.

18. Balmer R, Bu'Lock FA. The experiences with oral health and dental prevention of children with congenital heart disease. Cardiol Young. 2003;13:439–43

19. Klingberg G, Oskarsdottir S, Johannesson EL, Noren JG Oral manifestations in 22q11 deletion syndrome: Int J Paediatr Dent. 2002; 12:14-23.

20. Agbelusi G A, Okoromah C N, Nwhator S O. Oral health knowledge, attitudes and practices of parents of children with congenital cardiac disease. Nig. Qt. J. Hosp. Med. 2005; 15:34-37.

21. Barreira JL, Baptista MJ, Moreira J, Azevedo A, Areias JC. Understanding of endocarditis risk improves compliance with prophylaxis. Rev Port Cardiol. 2002;21:939-51.

22. Eldridge K, Gallagher JE. Dental caries prevalence and dental health behaviour in HIV infected children. Int. J paed Dent. 2000:10:19-26.

23. Khurana M, Martin M. VOrthodontics and Infective Endocardit J Ortho. 1999;26:295-8.

24. Lessard E, GLICK M, AHMED S, SARIC M. The patient with a heart murmur Evaluation, assessment and dental considerations J Am Dent Assoc.2005;136: 347-56.

25. Martin, M. V., Butterworth, M. L. and Longman, L. P. Infective endocarditis and the dental practitioner: a review of 53 cases involving litigation. *BDJ.* 1997;182:465–8.

26. Strom BL, Abrutyn E, Berlin JA, Kinman J L , Feldman R S, Stolley P D, Levison ME,. Korzeniowski O M, Kaye D. Risk factors for infective endocarditis: oral hygiene and nondental exposures. *Circulation.* 2000;102:2842–8.

27. Christopher H. Cabell, MD; Elias Abrutyn, MD; Adolf W. Karchmer, MD. Cardiology Patient Page. (*Circulation.*2003;107: e185.) 2003 American Heart Association, Inc.

28. Glick M, Greenberg BL. JADA. 2004;136:1541-6.

Obituary

The Management Committee of Tanzania Dental Association (TDA) sadly announces the untimely deaths of **Dr Benjamin Wilson Kishai,** who was a member of the TDA, **Ms Julia Campion,** who was the Common Wealth Dental Association (CDA) Administrative Secretary and Teddy Makiria, who was a Dental Technician.