

Oral health knowledge of parents of children and adolescents with congenital heart disease

Conhecimento dos pais de crianças e adolescentes com cardiopatia congênita sobre saúde oral

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ABSTRACT

Objective: To assess the knowledge on oral hygiene, infective endocarditis, and antibiotic prophylaxis of parents of children and adolescents with heart diseases assisted at the Hospital Ana Nery (reference hospital), Salvador, Bahia, Brazil. **Methods:** Cross-sectional study with 43 guardians of children and adolescents aged 2 through 16 years, performed with the application of a questionnaire. **Results:** In the sample of parents studied, 64% had completed high school and 47% had a monthly family income of up to one minimum wage. The majority (81%) reported knowing that oral infections may lead to heart complications, 42% knew that oral bacteria may migrate to the heart, and 51% knew the term infective endocarditis. When questioned about antibiotic prophylaxis, 93% had no knowledge about it and 88% did not know the reasons for using antibiotics before dental treatment. **Conclusion:** Parental knowledge was limited and fragmented. Further attention is required when transmitting information to parents, focusing on prevention strategies in order to guarantee the integral health of these children and adolescents.

Indexing terms: Endocarditis. Oral Health. Congenital heart diseases.

RESUMO

Objetivo: Avaliar o conhecimento sobre higiene bucal, endocardite infecciosa, e profilaxia antibiótica dos pais de crianças e adolescentes com cardiopatia congênita assistidas no Hospital Ana Nery, Salvador, Bahia. **Métodos:** Estudo transversal envolvendo 43 responsáveis de crianças e adolescentes de 2 a 16 anos, realizado através da aplicação de questionário. **Resultados:** Na amostra de pais estudada, 64% possuíam ensino médio completo e 47% tinham como renda familiar até um salário mínimo. A maioria (81%) afirmou ter conhecimento que infecções bucais podem levar a complicações cardíacas, 42% sabiam que bactérias da boca podem

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ir para o coração e 51 % conheciam o termo endocardite infecciosa. Quando questionados o que é profilaxia antibiótica, 93% não sabiam o que é e 88% desconheciam os motivos que levavam a necessidade do uso de antibióticos anteriormente a procedimentos odontológicos. **Conclusão:** O conhecimento dos pais mostrou-se limitado e fragmentado. É necessária maior atenção na transmissão da informação aos mesmos, focando em estratégias de prevenção a fim de garantir a saúde integral destas crianças e adolescentes.

Termos de indexação: Endocardite. Saúde bucal. Cardiopatias congênitas.

INTRODUCTION

Congenital heart disease (CHD) is a congenital malformation of the heart or the large intrathoracic vessels, with either actual or potential functional significance. Interatrial communication, interventricular communication, persistence of the arterial duct, and others are among the main defects [1]. In Brazil, in 2010, when applying a prevalence rate of CHD of 9:1 000 births, 25,757 new cases were estimated within the 2,861,868 births of that year [2].

Several CHD patients are susceptible to infective endocarditis (IE), which may be triggered by the bacteremia from dental procedures or from daily toothbrushing and mastication habits [3]. The pathogens originate from the bacterial biofilm and are the leading etiological factors of infectious oral diseases such as periodontal disease and dental caries, which are the main illnesses of the oral cavity [4].

The IE presents high morbimortality rates and results from the interaction between the pathogenic agent present in the blood stream with molecular matrices and platelets attached to sites of endocardial cell damages. Several of the clinical manifestations of IE patients develop through a host immune response to the infecting microorganism [3]. The infection may be caused by bacteria, fungi, rickettsia, and chlamydia. Endocardial damage may occur by inflammation (rheumatic disease) or trauma determined by turbulent blood flow (arteriovenous shunt) [5].

Children with CHD may require specific care, considering they present physiological characteristics typical of cardiac malfunction. The oral health of CHD patients requires major attention, with the need for regular dental follow-up. Some studies have shown worse oral conditions for children with CHD when compared to healthy ones, associated with a knowledge deficit from the guardians regarding oral hygiene and the relationship of oral sites of infection with IE, as well as their health risks [6-8].

Therefore, this study aims to assess the knowledge of parents of children and adolescents with CHD assisted at the Hospital Ana Nery on oral hygiene, infective endocarditis, and antibiotic prophylaxis.

METHODS

It is a descriptive and cross-sectional study developed at the pediatric ward and ICU and the dental outpatient clinic of the Hospital Ana Nery, which is a cardiology service reference of the Brazilian public health system, located in the city of Salvador, Bahia, Brazil.

One single researcher collected the data after project approval by the Research Ethics Committee of the Hospital Ana Nery, with opinion number CAAE 64093717.9.0000.0045, according to Resolution no. 466 of December 12, 2012.

The convenience sample was obtained from May to December 2017 and included parents (older than 18 years) of pediatric and adolescent congenital heart disease (CHD) patients aged 2 through 16 years, hospitalized in either the pediatric ward or ICU, and patients who sought outpatient care at the hospital's dental clinic. After the researcher explained the objectives of the study when approaching the parents, those who accepted to participate signed the Informed Consent Form.

The information were collected through the application of a questionnaire with questions related to the social condition of the family, care practices learned from the multi-professional team after diagnosing the heart disease, practice and knowledge on oral hygiene, and diet habits. The researcher created the questionnaire along with the dental team of the hospital, considering the daily demands when assisting such patient profile.

The questions were read and explained so the participants would easily understand. This step was performed away from other people to ensure the comfort and privacy of the participants.

The data were digitized in the Microsoft Excel™ 2007 software, assessed for absolute and relative frequencies of events, and subjected to descriptive analysis.

RESULTS

A total of 43 guardians accepted to answer the questionnaire, including 7 fathers and 36 mothers with average age of 36.14 years (ranging from 22 to 68 years old). From these, 84% were born upstate and the majority of 60% of them lived in the urban area. As for level of

education, 28% had not completed high school and 26% had completed high school. More than half of the sample performed labor activities (53%) and the occupations most mentioned were housekeeper (16%) and farm worker (16%). Most of them had a monthly family income of up to one minimum wage (47%) (table 1).

The average age of the children was 7.3 years (ranging from 2 to 14 years old) and the great majority of school-aged children (77%) were enrolled in educational institutions. Most of them was diagnosed with congenital heart disease (CHD) between 2 and 5 years old (42%),

Table 1. Socioeconomic/demographic profile of the parents of children and adolescents with congenital heart disease assisted at the Hospital Ana Nery, Salvador (BA), 2017.

Variable	n	%
Sex		
Male	7	16%
Female	36	84%
Origin		
Urban	26	60%
Rural	17	40%
Upstate	36	84%
City of Salvador	7	16%
Level of education		
Illiterate	2	5%
Incomplete Elementary School	12	28%
Complete Elementary School	5	12%
Incomplete High School	08	19%
Complete High School	11	26%
Incomplete Higher Education	3	7%
Complete Higher Education	2	5%
Are you a recipient of <i>Bolsa Família</i> (Brazilian social program)?		
Yes	16	37%
No	27	63%
Labor activity		
Performs labor activity	20	47%
Does not perform labor activity	23	53%
Occupation		
Housekeeper	7	16%
Farm worker	7	16%
Housewife	4	9%
Teacher	4	9%
Other activities	21	50%

among which 65% had been subjected to previous surgery and 65% were off medications. Present in 14% of patients, interatrial communication was the most prevalent heart disease, but 30% of parents could not inform the correct congenital disease of their children. An expressive part of the sample (74%) affirmed having received the first care instructions from physicians and 19% reported having never received any.

According to the parents, 86% of children had already been to the dentist and 70% had a dental visit at least six months prior to the day of questionnaire application. The majority had access to a dentist through the Brazilian public health system (67%) and in 53% of cases, the reason for the appointment was medical recommendation (table 2). Among the last procedures performed in the children who had visited the dentist, 65% involved restorations and/or extractions due to caries.

When asked whether they considered the oral hygiene of their children satisfactory, 72% of parents said

yes (table 3). Some of them associated the justification for the positive response with toothbrushing frequency, as seen in the following responses:

GUARDIAN 21 - *"I think it is good because I do it at home (referring to toothbrushing) and you (hospital dental team) do it here"*.

GUARDIAN 22 - *"I make her brush 3 to 4 times a day"*.

As for oral hygiene instructions for child care, 70% of parents reported having received instructions and most of them were instructed at the dental office (58%) (Table 03). Thus, 65% of parents said their children brushed their teeth 3 times a day, 67% said the children did not use dental floss daily, and 86% said the children had no gingival bleeding (table 3).

Overall, the guardians claimed to monitor the oral hygiene practice of their children (91%). All children had their own toothbrush and there was no family sharing. According to parents, most children had experienced

Table 2. Information on the access to dental treatment of children and adolescents with congenital heart disease assisted at the Hospital Ana Nery, Salvador (BA), 2017.

Variable	n	%
Has your child been to the dentist?		
Yes	37	86%
No	6	14%
When was your child's last dental visit?		
Up to 06 months	30	70%
06 months to 01 year	5	12%
From 01 to 02 years	2	5%
How did you access the dentist?		
Private service	7	16%
Health plan	1	2%
Public health system	29	67%
Who instructed the family to seek dental care?		
Physician	23	53%
Other health professional	1	2%
Relative	1	2%
Myself	12	28%

Table 3. Guardian perception on oral hygiene and gingival bleeding of children and adolescents with congenital heart disease assisted at the Hospital Ana Nery, Salvador (BA), 2017.

Variable	n	%
Do you consider the oral hygiene of your child satisfactory?		
Yes	31	72%
No	12	28%
Have you received oral hygiene instructions?		
Yes	30	70%
No	10	23%
I don't know	2	5%
Where did you receive oral hygiene instructions?		
Dental office	25	58%
School	1	2%
Event	1	2%
Elsewhere	3	7%
Did not receive	13	30%
How many times a day does your child perform oral hygiene?		
1x	2	5%
2x	13	30%
3x	28	65%
Unknown	1	2%
Does your child use dental floss?		
Yes	14	33%
No	29	67%
Does the gingiva of your child bleed?		
Yes	6	14%
No	37	86%

toothache (53%). When asked whether the children consumed a lot of sweets, 40% of parents said yes and 95% reported understanding that sweets may harm oral health (table 4).

A total of 42% of parents knew that oral bacteria might migrate to the heart. Regarding IE, 51% of parents knew the meaning of it. Most parents (81%) reported knowing about the relationship between oral and heart diseases (table 5). When asked on how they thought such relationship occurs, some parents justified as follows:

GUARDIAN 6 - *"The tooth harms the heart. She took so many medications"*.

GUARDIAN 8 - *"The doctor said so, because of the microbes"*.

GUARDIAN 12 - *"Because the same bacteria in the tooth may harm the heart"*.

Almost the entire sample (93%) did not know the meaning of the term "antibiotic prophylaxis". After learning the meaning of the term in a more familiar language from the questionnaire applicator, 88% of parents still could not understand the reason for the need of prophylaxis. On the other hand, 95% deemed important to perform dental treatment before heart surgery (table 5).

More than half of the guardians (63%) reported having been informed about the oral hygiene care required for CHD patients immediately after diagnosis. Mainly physicians (85%) and dentists (07%) transmitted such instructions (table 6).

Table 4. Guardian information on oral hygiene practice, sugar intake, and the presence of toothache in children and adolescents with congenital heart disease assisted at the Hospital Ana Nery, Salvador (BA), 2017.

Variable	n	%
Do you monitor your child's toothbrushing?		
No	4	9%
Yes	39	91%
Does your child share a toothbrush with others?		
No	43	100%
Has your child experienced toothache?		
No	20	47%
Yes	23	53%
Does your child eat a lot of sweets?		
No	26	60%
Yes	17	40%
No	2	5%
Yes	41	95%

DISCUSSION

A perception on multidisciplinary care from the guardians of children and adolescents with congenital heart disease (CHD) is essential and facilitates the maintenance of the quality of life of such patients. However, their understanding on oral health and the repercussions for developing a potential infective endocarditis (IE) is inadequate and full of gaps [9,10].

In this study, most parents reported knowing that oral infections may lead to cardiac complications, but only slightly more than half of them knew the term infective endocarditis, while less than half knew that oral bacteria might result in bacteremia and cause cardiac complications. The contradiction of such knowledge may be seen not only in the quantitative results aforementioned, but also in the speech of some guardians, whose justification on the relationship of oral infections with cardiac complications differed from the reality.

The lack of knowledge on IE among cardiac patients is concerning, as shown in the study by Amaral et al. [11], which among a sample of 75 adult patients hospitalized in pre-cardiac surgery found that 89.3% ignored the risks of IE. Among such patients, 58.6% required dental treatment.

Corroborating previous studies [7,12,13], most of the sample studied in the present one did not know the term "antibiotic prophylaxis" and did not understand the reason antibiotics are used before some dental procedures. These results are not compatible with the diagnosis time of 2 to 5 years prevailing in the sample and with the number of children and adolescents that had been subjected to previous surgeries, considering that preoperative dental care is of utmost importance for removing potential sources of oral infections that may cause bacteremia. It is evident the lack of interaction of the multidisciplinary teams and the absence of satisfactory knowledge transmission to these guardians.

The relationship between information deficit and low level of education [8,10,12] was also observed in the present study, considering that most of the sample had not completed high school (although statistical tests were not performed). The present study differs from the studies by Cetta et al. [13] and Cheuk et al. [10], which found gaps in parental understanding even with most of the sample having completed high school. Thus, the way such knowledge is acquired is questionable, which evidences a superficiality of the information transmitted.

Most parents showed satisfactory knowledge on the oral health care of their children, when considering

Table 5. Perception of the guardians of children and adolescents with congenital heart disease assisted at the Hospital Ana Nery, Salvador (BA), 2017 on the relationship between oral and systemic health and antibiotic prophylaxis.

Variable	n	%
Do you know that oral bacteria may go to the heart?		
Yes	18	42%
No	25	58%
Do you know what infective endocarditis means?		
Yes	22	51%
No	20	47%
I don't know	1	2%
In your opinion, is there a relationship between oral and heart diseases?		
Yes	35	81%
No	6	14%
I don't know	1	2%
Do you know what antibiotic prophylaxis means?		
Yes	3	7%
No	40	93%
Do you know why these patients need antibiotic prophylaxis?		
Yes	5	12%
No	38	88%
Do you think dental treatment is important before surgery?		
Yes	41	95%
No	2	5%

Table 6. Perception of the guardians of children and adolescents with congenital heart disease assisted at the Hospital Ana Nery, Salvador (BA), 2017 on the importance of dental treatment.

Variable	n	%
After diagnosis, did someone instruct you on oral care and dental visits?		
Yes	27	63%
No	16	37%
What professional informed you about oral care and dental visits?		
Dentist	2	7%
Physician	23	85%
Other professional	1	2%

that most of them claimed having received oral hygiene instructions, monitoring their children's toothbrushing, and that a great number of children had visited the dentist 6 months earlier and brushed their teeth 3 times a day. The truth of such information is debatable when comparing

with the responses obtained from other variables hereby discussed.

Considering numerous discrepancies regarding the knowledge on IE and oral health, the present study may not leave out the fact that a dental professional

related to assistance interviewed the parents, which may have led them to give inconsistent responses to please the professional or out of embarrassment.

This suspicion is plausible, considering there was a high rate of children and adolescents who had experienced toothache and a significant number of them had been subjected to restorations or extractions due to caries. This is observed in other populations such as India, where 78% of the parents said they only take their children to the dentist in case of pain [8], which leads to the perception that curative dentistry still prevails over preventive dentistry in this group and that the knowledge acquired is not practiced in daily habits.

Another explanation for the high rates of oral disease observed may be justified by the excessive benevolence of parents on the heart disease of their children, which makes them offer sweets as a reward [14]. In the present study, almost all the parents interviewed knew the harm sweets may cause to oral health, but part of them reported the children consume sweets regularly. The emotional and functional overload than involves the process of child care or the crying of children when performing hygiene causes the parents to potentially neglect oral health care [14-16].

Moreover, one risk factor for developing oral diseases is the constant use of pediatric drugs with sugar for palate appeal, which parents not always see as a potential villain [17,18].

Parents treat the use of dental floss with neglect, considering that more than half of children and adolescents did not use it. A study with 307 guardians of children aged 2 through 8 years concluded that 229 did not floss. Among the main reasons reported to explain the negligence for the auxiliary method of oral hygiene, 89 mothers affirmed that it occurred because the children do not let them, 110 reported lack of habit, 86 found the product expensive, and 43 said it takes too long [19]. Such issues listed above are compatible with the work overload of the parents from the sample of the present study and their income.

A good protocol for assisting cardiac patients requires planning for future dental clinical procedures, considering the social determinants and the living conditions of caregivers and patients. Hence, satisfactory anamnesis and definition of risk factors are essential for treatment selection and for determining the need for antibiotic prophylaxis [20]. Bonding is also required, as

well as the sensitivity to listen to patients and their needs, seeking a treatment plan that includes the needs and expectations of both patients and guardians [21].

There are many flaws in the learning process of these guardians, for both the knowledge on oral hygiene habits and the interrelation between oral diseases and their complications in CHD, IE, and the care required to prevent them, such as the use of antibiotic prophylaxis. It was detected that communication in the service of the hospital studied is still weak for the professional-patient relationship and between the medical-dental teams, which is also challenged by the social determinants of the population. However, such reality is seen in the world literature.

Dental care in the Brazilian public health system is still recent. The National Oral Health Program - Brasil Sorridente (Smiling Brazil) was implemented just in 2003, inserting the dentist in the team of the Family Health Program (FHP) and creating Dental Specialty Centers for the treatment of special cases, including special needs patients. These facilities should treat cardiac patients when they require more complex procedures, after adjusting the dental field in the FHP [22].

However, the care for special needs patients in this system does not present a great resolution power. A study in a Brazilian northeastern city concluded that the care for such patients in the FHP is limited to oral health instructions and low-risk procedures. Only 20.5% of the professionals interviewed said they were trained or had subjects on special patients during their education [23]. Araújo et al. [24] found that 100% of a sample of primary care dentists did not know the risk classification of cardiac patients and the conditions in which antibiotic prophylaxis is recommended.

The lack of training of dentists limits and often prevents a regular oral health follow-up of CHD patients. Therefore, when such patients get access to dental care, the oral diseases are already established. In the daily practice of the hospital used for this study, it is common to find patients who had to travel long distances from their hometown to obtain basic dental treatment in tertiary care. They have often visited several public and private dental offices and had services denied for being cardiac patients.

This study indicated the flaws in which dental care is inserted, which corroborate the literature, showing the review points required for the dental team with a constant

partnership with other professionals such as physicians and nurses, among others. The cross-sectional nature of the study is weak and makes it impossible to find more significant statistics on the reality studied, but it allowed the indication of demands and it can guide intervention proposals and further research projects of higher impact.

CONCLUSION

This study may conclude that the knowledge of parents on the relationship between oral infections and infective endocarditis is inconsistent and fragmented, and there is a gap between the lessons received and what is actually learned. The information are transmitted with technical terms, without explaining the action mechanism that leads to the interrelation between oral and systemic health, in an unprofessional manner and without a continued educational program.

The presence of more trained dentists is required to follow-up these children and their family members, and the pre- and postoperative care of these children cannot be curative and occur only one time. A higher participation of dentists in multidisciplinary teams would strengthen an integral care network along physicians, nurses, and other professionals of the three care levels.

Collaborators

CLS PINHEIRO, creation of the study methodology, questionnaire, single researcher, literature review, and text production. ACLO MEIRA, orientation for text production. AS Santos, creation of the study methodology, questionnaire, and orientation for data collection and final text production. DS Arcanjo, orientation for text production.

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