

Review Article

The role of dentists on medically compromised children's oral and dental prophylaxis in Hospital

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ABSTRACT

Background: One of dentist's main roles is to coordinate the management of medically compromised children. The term of medically compromised refers to those children who have medical conditions which affect the dental treatment or manifest as a specific oral and dental problem. Patient's visit to Special Care for Dentistry Clinic Dr. Hasan Sadikin Hospital Bandung showed a remarkable increase. From under 10 new visit in 2003, now July–December 2008 showed 81 new visit. **Purpose:** This paper discusses several medical problems (cardiovascular, hematology, respiratory system, and genetic disorder) in children and the role of dentist in the treatment of those patients in the hospital. **Review:** The increase of attention by all level to these medically compromised children in the hospital also increases the dentist's role in supporting the prognosis of the disease and patient's quality of life. The most important effort is oral and dental prophylaxis to prevent oral pathology which is caused by the manifestation of disease as well as the side effects of treatment. **Conclusion:** It is, concluded that role of the dentist in managing these patients is giving preventive efforts and dental treatment that may be improve patient's quality of life. The preventive effort and dental treatment is customize according to the patients condition. Nevertheless, cooperation from the dentist and other professional is needed in treating these patients.

Key words: medical problem, oral manifestation, management, prophylaxis

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INTRODUCTION

One of dentist's main roles is to coordinate the management of special needs children. The term of special need refer to a child who has a medical condition that affects dental treatment or shows specific oral and dental manifestations. Some countries called these patients as medically compromised children.¹ A survey to special needs children who came to Special Care for Dentistry Clinic Dr. Hasan Sadikin Hospital in Bandung showed that these children have poor oral hygiene level.

Many general medical conditions may directly affect dental treatment and in several conditions are a consequence of dental disease, or even a dental treatment may cause an implication that leads to life threatening. Increase in number of children who survive from complex medical disorder shows several abnormalities in their oral cavity. The remarkable decline in childhood mortality has led to

increasing emphasis on maintaining and enhancing the quality of the child's life and ensuring that children reach adult life as physically, intellectually, and emotionally healthy as possible. Dental care can play an important part in enhancing this quality of life.² According to the data from Special Care for Dentistry Dr. Hasan Sadikin Hospital Bandung, in 2003 there are under 10 new visits and increase to 81 new visits in July-December 2008.³

There are many systemic diseases that show oral manifestation.⁴ Dentist should be able to recognize the manifestation so diagnoses and treatment plan can be done accurately. This paper discusses about several medical conditions in children and the dentist's role in the treatment of those patients in the hospital.

Cardiovascular disorder

Heart diseases can be divided into two main groups, congenital heart disease and acquired heart disease.²

Almost every heart disease in children occurs congenitally with the prevalence of 8-10 in 1000 life birth.^{1,2,5} Children with congenital heart disease are the most common medically compromised children seen by the dentist.¹ From July–December 2008, there are 64 new visits of children with congenital heart disease to Special Care for Dentistry Dr. Hasan Sadikin Hospital. They were refer from their pediatricians in order to have mouth preparation before heart surgery.

Etiology of congenital heart disease is rarely known and may be the combination of genetic and environment factors, including infection during the second month of pregnancy. Several chromosome disorders such as Down syndrome is related to a severe congenital heart disease.²

Generally, congenital heart disease include Ventricular Septal Defect (VSD), Arterial Septal Defect (ASD), patent ductus arteriosus (PDA), and tetralogy of fallot (ToF).^{1,2,5-7} Acquired heart disease include myocarditis, infective endocarditis, and rheumatic fever. All of these diseases may cause death in children.^{2,5}

The most important consideration in planning a dental treatment for children with cardiovascular disorder is to prevent the occurrence of dental disease. When a child is diagnosed having a heart disease, the child should immediately refer to a dentist to get a proper dental treatment and preventive efforts which include diet counseling, fluoridation, fissure sealant, and oral hygiene instruction. Regular check up, clinically or radiographically for preventive efforts, is highly recommended.^{2,5} Treatment of active dental disease should be done before heart surgery.²

Invasive dental treatments, such as tooth extraction, scaling, and endodontic treatment may cause bacteriemia.⁵ Pulpotomy is contraindicated due to the possibility to cause bacteriemia.¹ If a patient is going to be treated with a treatment that may cause bacteriemia, antibiotic prophylaxis is needed to prevent the development of endocarditis.² An



Figure 1. Nine year-old boy with tetralogy of fallot being monitored during dental treatment.⁸

antiseptic mouthwash such as chlorhexidine 0.2% can be given before dental procedure.¹ During dental treatment, patient should be monitored by pulse oxymetry to evaluate his/her pulse and oxygen intake (Figure 1). Oxygen inhalation also needed if patient's saturation is below 70%.^{6,7}

Children with congenital heart disease are included to a group of high risk caries, especially in primary dentition. However, there is an increase prevalence of enamel mineralization disturbance, such as enamel hypoplasia.^{1,5} If the child has a lot of caries, it is considerable to undergo the dental treatment under general anesthesia. This may reduce the antibiotic therapy and dental visit. Dental treatment under general anesthesia needs coordination with pediatrician and anesthesiologist.¹

Hematology disorder

In early childhood, many bleeding disorders have genetic background. Common hematology disorders in children are thalassemia and leukemia.² Thalassemia is a blood disorder with the absence or lack of one of the globin chain from hemoglobin complex. Normally, blood from a healthy adult contain hemoglobin A that include two chain of globin (HbA, $\alpha_2\beta_2$) and a minor amount of hemoglobin A₂ (HbA₂, $\alpha_2\gamma_2$). Children also develop fetal hemoglobin (HbF, $\alpha_2\delta_2$).¹

Dental implication of thalassemia is malformation of jaws. This was due to overgrowth in the maxilla and zygoma. Class II division 1 malocclusion is a common jaw disorder in thalassemia children. Treatments for thalassemia are regular blood transfusion and the administration of desferrioxamine-an iron-chelating agent. Blood transfusion may cause gingival discoloration (hemosiderosis) resulted from ferrum accumulation.¹ Bone involvement is the commonest clinical manifestation of thalassemia. These include the involvement of alveolar bone.⁹

Dental treatment for patient with thalassemia needs an adequate medical history evaluation. Consultation with child's pediatrician or hematologist before initiating dental treatment is important. Treatment that is highly recommended for those patients is preventive treatment and regular dental check up. Dental treatment is preferable to be carried out after blood transfusion. The treatment is postponed if patient's hemoglobin level is below 100 g/L.²

Respiratory system disorder

Respiratory system disorder that commonly occurs in children is asthma. Asthma is a diffuse obstructive lungs disease that may cause short winded, cough, and wheezing. This is related to hyperactivity of airway to any stimuli.²

Children with asthma commonly receive medication with steroids. These drugs may cause extrinsic discoloration in tooth surface due to oral flora changes which results in a candidiasis. Corticosteroid can also change oral cavity pH and reduces salivary flow resulting an increase in the possibility of dental erosion. Children with asthma breathe

through mouth, may lead to the development of gingivitis and gingival enlargement in anterior part.¹

Dental treatment may cause emotional stress which can develop asthmatic attack. Dental extraction or other treatments that need local anesthesia usually do not cause any trouble.² Generally, dental treatment for children with asthma is regular dental prophylaxis. Child is ordered to wash their mouth after using steroid inhaler or other medication.¹

Genetic disorder

Child with genetic disorder usually visit a dentist with specific dental anomalies that is related to their condition or a medical problem that complicate dental treatment. Not every child having genetic disorder come to the dentist. History taking can be simplified by making a simple family pedigree.¹

Generally, dental treatment for a child with genetic disorder is to overcome the oral complication and manifestation that related to the disorder. However, it is important for a dentist to recommend the parents or patient's relative for genetic counseling. This is a process to make diagnostic assessment, information, and support to the family or individual who have the risk in developing genetic disorder.¹

Genetic disorder discussed in this paper is Apert syndrome, which is a rare genetic disorder and characterized by specific abnormality of craniofacial and extremities structures. Oral manifestations are prominent mandible, decline edge of mouth, cleft palate, dental malposition, crowding, delayed tooth eruption, thickened alveolar ridge, malocclusion and hard palate deformity termed Byzantine arch deformity.^{10,11}

Apert syndrome is characterized by midface hypoplasia, syndactyly of the hands and feet, proptosis of eyes, steep and flat frontal bones, and premature union of cranial sutures. Maxillary hypoplasia, deep palatal vault, anterior open bite, crowding of the dental arch, severely delayed

tooth eruption, and dental malocclusion are the main oral manifestations of this syndrome.¹²

Management of children with Apert syndrome needs team approach that consist of craniofacial surgeon, neurosurgeon, oral surgeon TNT specialist, audiologist, speech pathologist, psychology, ophthalmologist, pedodontist, dan orthodontist.^{2,9} The main treatment method is surgery that is needed to correct craniofacial abnormalities and fused fingers and toes. Beside surgery, the treatment also termed to correct upper respiratory tract, eyes deformities, or abnormalities in dental area.¹¹

DISCUSSION

Many medical disorders may directly affect dental treatment and in several conditions it is a consequence of dental disease, thus it may leads to life threatening. Children with medically compromised condition sometimes have to be treated in hospital. These may lead to a lack of dental care that resulted in complex oral manifestations. Lack of knowledge from their parents about the importance of maintaining oral health may exacerbate the existing medical conditions. Early professional's intervention is very important in carrying examination, risk assessment, and giving information and tutorial, thus oral diseases can be prevented.⁵

Congenital heart disease is more common occur in children than acquired heart diseases. Many heart diseases need antibiotic prophylaxis before undergoing invasive dental treatment. Another important aspect to be carried out is patient's monitoring during dental treatment. These includes oxygen administration and observation of pulse and oxygen saturation with pulse oxymetri (Figure 1).²

Child with bleeding disorders, such as hemophilia, thrombocytopenia, and Von Willebrand's disease, have to be checked their hematological status before carrying out dental treatment. Hematologic replacement therapy



Figure 2. (A) Patient's face, (B) Byzantine arch deformities.¹³

may be needed before operative treatment. Bleeding disorder in form of anemia is in a risk of dental treatment under general anesthesia.² The importance of adequate dental plaque control techniques in order to prevent inflammation, potential bleeding and infection in these patients is emphasized. The pediatric dentist must be aware of the clinical appearance of bleeding disorder in order to recognize the condition and successfully manage the patient.¹⁴

Child with genetic disorder needs a special attention in their oral and dental care especially due to the complexity of the abnormalities in oral cavity. These include the abnormality of dentocraniofacial complex.^{9,10} Dental treatment of these patient usually needs specific team approach consists of pedodontist, pediatrician, TNT specialist, anesthesiologist, and surgeon.¹¹

Increased number of children who survive from complex medical problem may be due to the increase of the advanced medical treatment and the management of oral manifestation and complication through oral and dental prophylaxis. Role of the dentist in managing these patients is giving preventive efforts and dental treatments that may be improve patient's quality of life. Nevertheless, cooperation from the dentist and other professional is needed in treating these patients.

In conclusion managing children with congenital heart disease, dentist may make intervention as early as possible after a child being diagnosed having a heart disease. With preventive efforts, the child will have a good oral conditions so they can undergo heart surgery. Children with hematology disorder, such as thalassemia, have dental implication due to malformation of the jaw which lead to class II division I malocclusion. The role of the dentist is to minimize this malocclusion so the child may have a "normal" appearance. These is also due to children with genetic disorder. The dentist's role is to correct the abnormalities in dental area.

Children with respiratory system disorder have dental implication due to the drugs they used to treat

their conditions. The role of the dentist in this children is to minimize the side effect of the drugs to their oral environment.

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