The Prevalence of Caries in Down Syndrome Children at POTADS Foundation

Huzaifah Mahbubi 1, Vycke Yunivita Kusumah2, Inne Suherna Sasmita3, Willyanti Soewondo4

1, 2, 34Department of Pedodonty, Faculty of Dentistry, Universitas Padjadjaran, Jalan Sekeloa Selatan I, Bandung, Indonesia
1huzaifahmahbubifat@yahoo.co.id
2v.yunivita[at]unpad.ac.id
3inne.sasmita[at]fkg.unpad.ac.id
4Co Author: willyanti.soewondo[at]fkg.unpad.ac.id

Abstract: Down syndrome is a Trisomy disorder that causes intellectual and motoric limitations. Caries is a multifactorial disease that causes cavities formation on the surface of the tooth. Caries calculations are using the prevalence formula. Caries prevalence is the number of caries sufferers divided by the total sample. The purpose of this study was to determine the prevalence of caries in Down Syndrome patients in the POTADS Foundation. This was a descriptive study on a total of 35 Down Syndrome patients collected through consecutive admissions technique. Caries was assessed by the presence of cavities and brownish-black discoloration on the tooth surface by doing condition using a sonde tool and measured using the prevalence formula. The prevalence of caries in Down Syndrome children at the POTADS Foundation was 83%. The high prevalence of caries in children with Down Syndrome is caused by a disruption in motor skills and lack of parental supervision. It was concluded in this study that the prevalence of caries in Down Syndrome children at the POTADS Foundation is high.

Keywords: down syndrome children, caries prevalence

1. Introduction

Down Syndrome (DS) is a genetic disorder caused by chromosomal Trisomy 21 that becomes the main cause of genetical diseases all over the world. A neonate with DS has more chromosomes with a total amount of 47[1]. According to the World Health Organization (WHO), the prevalence of DS is between 1:1000 and 1:1100 of births all over the world; 3000-5000 neonates born yearly were with (had) chromosomal disorders; while other sources revealed 1:700 births[2,3]. Riset Kesehatan Dasar (Riskesdas) in 2013 stated the incidence caused by Down Syndrome was worth 0.12% in 2010 and increased to 0.13% in 2013[4].

The general oral characteristics were maloclusion, delayed eruption, form and size defects of the teeth, calculus precipitation and severe periodontal diseases [1]. This is the most often found chromosomal disorder on mentally retarded people [5].

DS patients have intellectual and motoric limitations that might cause difficulties for them in self care such as eating and toothbrushing that might result an impact on their mouth hygiene and increase the risk to have caries[6,7].

Several studies on the prevalence of caries in DS and normal children revealed different results. One study revealed that DS children had a higher prevalence of tooth caries, and other studies stated lower prevalence of tooth caries [1]. The study on DS children showed the lower index of caries because DS children had higher pH, sig A and ion calcium. Other study on 69 DS children and 69 children without congenital diseases found an insignificant difference of DMF-T index on both groups. This study showed that there was no differences of caries index between DS and normal children [7].

Studies on the caries prevalence in DS children in Indonesia had been done, but none of them was done in a Foundation of Parents of Down Syndrome children (POTADS), and this makes the author(s) to conduct this study.

2. Methods

This was a descriptive observational study. The subjects (respondents) were DS patients in POTADS Foundation in Bandung. The samples were collected through consecutive admission technique, i.e. every DS patient who came to Pedodonty Hospital, Faculty of Dentistry Universitas Padjadjaran to have an examination of his or her oral hygiene.

Tools and materials used in this study were gloves, masks, oral mirrors, sonde, probe WHO, informed consent, examination form, writing materials, dental unit. The study was performed during December 2018 at the Pedodonty Hospital, Faculty of Dentistry Universitas Padjadjaran after having the ethical approval (No 1511/UN6.KEP/EC/2018) from the Ethical Research Commission Universitas Padjadjaran. The first procedure was to fill in and sign the informed consents by the parents. Then the patients were seated on the dental unit and the operators put on the masks and gloves. The clinical examinations, that is visual and sonde examinations were done on all parts of the teeth of the DS children. The caries results were noted on the examination form. All data collected from the study were noted, processed and analyzed using descriptive data analysis to be presented in table forms.

3. Results
Table 1 shows the characteristics of the respondents based on sex and age.

<table>
<thead>
<tr>
<th>Age (Year)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>2 - &lt;5</td>
<td>2</td>
<td>5.7</td>
</tr>
<tr>
<td>6 - &lt;10</td>
<td>10</td>
<td>26.5</td>
</tr>
<tr>
<td>11 - &lt;14</td>
<td>1</td>
<td>2.8</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>37</td>
</tr>
</tbody>
</table>

Table 1 shows the characteristics of the DS children in POTADS Foundation based on sex and caries; 13 of 14 males (92.8%) had caries, and 17 of 22 females (77.2%) had caries.

Table 2 shows the characteristics of the DS children in POTADS Foundation based on age and caries. The prevalence of caries based on age are as follows: aged 2-5 years were 8 (22.8%), aged 6-10 years were 10 (28.5%) and aged 11-14 years was 1 (2.8%). The frequency of females aged 2-5 years were 8 (22.8%), aged 6-10 years were 11 (31.4%) and 11-14 years were 3 (8.5%).

Table 3 shows the characteristics of the DS children in POTADS Foundation based on sex and caries; 13 of 14 males (92.8%) had caries, and 17 of 22 females (77.2%) had caries.

Table 4 shows 29 (83%) of 35 DS children at POTADS Foundation had caries. The result of this study showed that more than half population of the sample had caries, and this was similar with the result of a study on 26 DS children and 23 normal children aged 1-14 years. The results of this study showed that DS children had high prevalence of caries because of their bad habit to use the bottles. They used to drink using bottles up to 18 months of age that might increase the risk of nursing bottle caries[12]. Other study also found 94% of 17 DS children had low salivary flow rate, 83% had low pH, and streptococcus colony was found on 96% of the samples[9]. A study on 45 samples found 31 (68.9%) had bad teeth health as the results that DS children had several types of oral manifestation and interference of motoric ability that unable them to do their activities by their own, especially to care their oral health[13].

Other study also stated the decrease of muscle level (hypotonia) in Down Syndrome might influence the muscles of the head and mouth cavity. Orofacial muscles were located on the orbicularis, zygomatic, masseter, temporalis, and the tongue muscle were located on the intrinsic and extrinsic muscles, i.e. transverse muscle, longitudinal, vertical, palatoglossus, styloglossus, and hypoglossus. The decrease tonus of the lips and cheek muscles might cause an imbalance condition during chewing and decrease the natural cleansing of the teeth caused by food as there are more remaining that was caused by decrease chewing function [14].

Blum theory described the state of mouth/oral hygiene of an individual or of a community is influenced by four important factors: descent, environment, behavior and health service. Of the four factors, behavior has the most important and direct effect in oral hygiene. Accordingly, the frequency of tooth-brushing as a behavior will influence the condition at the time of conception there was more acceptability of the sperm carrying Y chromosome against the ovariun that makes the DS child a male [8].
(good or bad) of the oral hygiene. The best thing of how to eliminate debris and dental plaque is to brush the teeth using manual or electric toothbrush. The role of the parents is also needed in watching the oral hygiene of mentally retarded children [15]. The parents have to apply/embed the discipline in caring and cleansing of the oral cavity as there is cognitive as well as motoric limitation in mentally retarded children [13].

Caries on a DS child might cause pain, difficulties in eating and affect the quality of life. Therefore the parents, teachers or health practitioners need to attend (need to give good attention) on the oral hygiene of DS child, good communication, and motivate the child to have good daily activities and plan for the right treatment of the caries[14].

5. Conclusion

Based on the result of this study, it was concluded that the prevalence of caries on Down Syndrome children at POTADS Foundation was 83% of 35 children.

References


Author Profile

Huaizaf Mahbubi (Indonesia) Student in Faculty of Dentistry Universitas Padjadjaran Bandung.

Vycke Yunivita Kusumah (Indonesia) Lecturer of Faculty of Medicine Universitas Padjadjaran, she is regarded as Doktor since 2019.

Inne Suhernya Sasmita (Indonesia) Currently lecturer in Pediatric Dentistry Department, Faculty of Dentistry, Universitas Padjadjaran, she is regarded as professor since 2018.

Willyanti Soewondo (Indonesia), received DDS from Universitas Padjadjaran in 1978 before continuing to specialist program in Pediatric Dentistry in Universitas Padjadjaran and graduated in 1995 before continuing her doctorate degree from Universitas Padjadjaran in 2009. She has been regarded as Professor title in 2015. Currently she is a lecturer in Pediatric Dentistry Department, Faculty of Dentistry, Universitas Padjadjaran. At present she is also a member of The Indonesian Dentists Association since 1978, Indonesian Paediatric Dentist Association since 2000, International Association of Paediatric Dentistry since 2017, and International Association of Dental Research since 2015.