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The Prevalence of Caries in Down Syndrome Children at POTADS Foundation

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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 Univertias 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 forms. 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 1: Characteristics of the respondents based on sex and age

Age (Year)	Male		Female	
	F	%	F	%
2 - <5	2	5,7	8	22,8
6 - <10	10	28,5	11	31,4
11 - <14	1	2,8	3	8,5
Total	13	37	22	62,7

Table 1 shows the frequency of males and females with Down Syndrome were 37% and 62.7%. Males aged 2-5 years were 2 (5.7%), 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 2: Characteristics of the respondents based on age and caries

Age (Year)	Caries		Non Caries	
	F	%	F	%
2 - <5	6	60	4	40
6 - <10	19	95	1	5
11 - <14	4	100	0	0

Table 2 shows the frequency of caries based on the age of DS children in POTADS Foundation aged 2-5 years: 10 (60%), aged 6-10 years : 20 (95%), and aged 11-14 years: 4 (100%).

Table 3: Characteristics of the respondents based on sex and caries

Caries	Sex			
	L	%	P	%
Yes	13	92,8	17	77,2
No	1	7,2	5	22,8
Total	14		22	

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: The prevalence of caries

	Frequency	Prevalence (%)
Caries	29	83
Caries burden	6	17

Table 4 shows the prevalence of caries on 35 DS children at POTADS Foundation based on the findings of caries on their teeth. As shown in Table 4, 29 of 35 DS children had caries and 6 had no caries that means the prevalence was 83%.

4. Discussion

Table 1 shows the sex ratio of 35 DS children at POTADS Foundation was 0.59, that is different from the results of previous studies that revealed male DS children had higher possibilities to have caries as the result of the meiosis disorder of the father that influenced the sex chromosome, or at the time of conception there was more acceptability of the sperm carrying Y chromosome against the ovarium that makes the DS child a male [8].

Table 2 shows the relation of the increase of caries prevalence based on age. The higher the age of the DS child, the higher the prevalence of the caries. This result was similar with the result of the study on 60 DS patients aged 1-48 years that revealed a significant increase of DMFT[9]. The increase in caries prevalence could be related with the age, because caries were cumulative and chronic. Studies on the relation of caries and age in the United Kingdom, Wales, Japan, and America showed significant relation [10].

Table 3 shows that males have a higher caries prevalence compared with females. According to the result of a study on 1-4 grade pupils of a School for Handicapped Children, the difference of caries between males and females was not significant that was caused by delayed eruption on DS children. Females have relatively earlier eruption time, but the time of eruption changes because of delayed eruption that makes the difference less/not significant[11]. The author(s) in this study could not conclude because the comparable total of male and female DS children in POTADS Foundation was not the same.

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

(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.

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