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Dental caries experience of haemophilic children aged 1-6 years

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ABSTRACT

Objective: To determine the dental caries experience in haemophilic children aged 1-6 years.

Methodology: A cross-sectional study was conducted at the Dental Department of Children's Hospital, Pakistan Institute of Medical Sciences in Islamabad, Pakistan between April 2015 and September 2019 after the Ethical Review Board approval. All the participants were screened for dental caries using the DMFT index. Examiners were trained & calibrated prior to the screening process. A dental record form was developed for recording the details; this was validated through a pilot study. Descriptive analysis of the data was carried out using SPSS v.20.0.

Results: Caries prevalence was found to be 82.8% with a mean dmft score of 3.99 (± 3.07) of which decayed teeth constituted 3.55. The mean dmft scores for 1, 2, 3, 4, 5 and 6-years old were 0.80 (±1.42), 2.83 (± 2.39), 3.93(±3.41), 4.11 (± 3.76), 4.42 (± 2.89) and 4.44 (± 2.85) respectively. Among the sample of 273 children 43 (15.8%) children claimed that they regularly brush their teeth twice a day, 134 (49.1%) brushed once a day while 96 (35.2%) children stated that they did not brush their teeth at all.

Conclusion: Dental Caries is more prevalent in haemophilic children as compared to their normal healthy counterparts. The need for preventive measures & better healthcare facilities was also realized.

Keywords: Dental caries, haemophilia, Oral health.

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Introduction

Haemophilia is a group of hereditary genetic disorders that impair the body's ability to control blood clotting or coagulation, which is used to stop bleeding when a blood vessel is broken. Dental management of haemophilic patients is complicated due to the increased tendency of bleeding, which can result in poor oral health status in such patient. As is with most of recessive sex-linked, X-Chromosome disorders, haemophilia is also more likely to occur in males as compared to females. It is further classified according to the clotting factors affected. Haemophilia A *(or Classic haemophilia)* is a deficiency of factor VIII that occurs in 85% of the patients, with a prevalence of approximately 1 in 10,000 males.[1] Haemophilia B *(or Christmas disease)* is a deficiency of factor IX with a prevalence of 1 in 50,000 males, accounting for nearly 10-15% of the haemophilic cases.[2]

In most of the developing countries, a majority of haemophilic patients fail to reach adulthood as haemophilia is often not given much consideration due to the presence of high number of other serious health problems.[3] Similarly, the oral care of haemophilic patients is not considered of any significance. Such patients tend to receive little or no oral health care, or of lower quality, than the general population.[4-6] This is despite the fact that haemophilic patients should be considered as a special needs group when seeking routine dental treatment as these procedures can be, and

often are, life-threatening. Even the maintenance of oral hygiene, through simple & common methods, becomes difficult due to the increased tendency of bleeding.[7]

Dental caries is one of the most common oral conditions recorded. It is highly prevalent in children and continues to be a significant public health problem worldwide.[8] In a study it was concluded that the proportion of haemophilic patients having dental caries was less than their normal counter parts, provided they received preventive advice from birth and professional care in multidisciplinary clinics.[9] Another study depicted that patients with congenital bleeding disorders were found to have a better dental health situation in primary dentition with oral bleeding being the only significant condition reported more in haemophilic children. However, quality of oral health related life was similar.[10] Keeping with this trend haemophilic children in Northern Ireland aged 2 to 15 years were also found to have less decay and a higher restorative index as compared to normal, healthy children in the same age group. This was again attributed to higher levels of motivation and health awareness in the parents and also the intake of fluoride supplements coupled with other preventive measures.[11]

Haemophilic patients must be considered as special patients and their management in dental settings differs significantly from that of a normal healthy person. Preventive dentistry has been reported to be vital for younger haemophilic patients whereas older patients, often, require extensive restorative treatment.[12] Another study advocated the development and use of multi-disciplinary teams and better collaboration between local and hospital services. Furthermore, the need to develop skills and knowledge of local dental healthcare professionals was also realized.[13] Studies also suggest that before any dental procedure is carried out, the patient should be referred to the haemophilic department to rule out the etiology of other bleeding disorders. Also, all treatment plans must be reviewed with the haemophilia unit in case a prophylactic cover is required.[14]

In Pakistan, no major oral health survey has been conducted at the national level to assess the level of oral diseases. However, pathfinder surveys were undertaken by World Health Organization that has shown a decrease in dental caries overall in general population of 12 and 15 years old.[15, 16] There have been some studies which have indicated the caries experience in pre-school as well as school going children.[16, 17]

Although there have been some research studies exploring the relationship between haemophilia and patient's oral health status and oral hygiene, there is a dearth of literature on the link between haemophilia and dental caries levels in children, especially in Pakistan. It is for this matter that this study was designed to focus specifically on the dental caries experience of haemophilic children aged 1-6 years.

The aim of this study was to determine the dental caries experience of children suffering from haemophilia in the age group of 1-6 years.

Methodology

A cross-sectional study was conducted at the Dental Department of Children's Hospital, Pakistan Institute of Medical Sciences in Islamabad, Pakistan between April 2015 and September 2019 after the Ethical Review Board approval. All haemophilic male children, presenting in the Haemophilic Center of CH, PIMS, in the age range of 1-6 years and having primary dentition were included in the study.

Patient record forms were formulated for recording dental caries experience, patient demographics as well as details of an individual's toothbrushing habits. These forms were validated by conducting a pilot study in the clinical departments of Islamabad Dental Hospital, Islamabad Medical & Dental College. An approval from the Dean of Dentistry and Allied, PIMS was sought for carrying out dental examination before commencing the research.

A total of 273 children were examined in the Dental Department of CH. After seeking consent from the patients and/or their guardians, the examinations were carried out in an ordinary chair, with the patient being in an upright position. The WHO criteria were followed in diagnosing dental caries.[18] To record dental caries, the universal 'dmft' index was employed.[19] Only primary dentition was recorded in patients with mixed dentition. Examinations were carried out by trained dental surgeons. Before the examination process, all the examiners were trained according to the protocol of indices involved and calibrated further to ensure increased inter-examiner as well as intra-examiner reliability. The armamentarium for dental examination included disposable kits comprising of mouth mirrors

and a blunt plastic probe. 'Standard Precautions', including the personal protection equipment were utilized during the examination process. Hand held light sources were used to provide adequate illumination. The diagnosis of caries was determined on visual evidence and blunt probe was used, with extreme care, to only confirm the status of questionable lesions. The missing component of dmft index included teeth lost due to dental caries only with the exfoliated teeth ignored where appropriate.

The participants were asked about their toothbrushing & flossing habit and details about their previous dental experience. This included any obstacles or problems faced during treatment and the level of satisfaction at the overall management protocol.

All the data from this sample of 273 children was entered into MS Excel format. Statistical Package for Social Sciences (SPSS), version 20.0, was used to carry out a descriptive analysis of the recorded data. The variables involved in the analysis were age, gender, dmft score & haemophilic status. For new cases, the frequency of brushing and flossing were also recorded.

Results

The overall caries prevalence in this study population of 273 children was 82.8% with only 47 children (17.2%) recorded as caries free. The mean age of this sample was 4.56 years (±1.6). (Table I & II) The overall mean dmft observed was 3.99 (±3.07) of which decayed component comprised of 3.55 (±2.80), missing component 0.29 (±0.94) and filled component only 0.15 (± 0.56). The maximum dmft value recorded for this sample was 13 ([Table II). The mean dmft of 1, 2, 3, 4, 5 and 6-year olds was 0.80 (±1.42), 2.83 (± 2.39), 3.93(±3.41), 4.11 (± 3.76), 4.42 (± 2.89), and 4.44 (±2.85) respectively. (Table I) Among the children diagnosed with having dental caries, the overall mean dmft score was 4.82 with dt being 4.29, mt 0.36, and ft 0.18.

Among this study group, 43 (15.8%) children claimed that they regularly brush their teeth twice a day, 134 (49.1%) brushed once a day while 96 (35.2%) children stated that they did not brush their teeth at all. (Table I)

The majority of these patients, 247 (90.5%), were satisfied with the treatment and facilities at the offer, however, a total of 26 participants complained about uncooperative hospital staff. The unavailability of free plasma was the most common barrier faced by these children.

Table I: Mean dmft distribution according to age

Age (years)	No. of Children	Mean dmft(±S.D)	Maximum dmft Score
1	15 (5.5%)	0.80(±1.42)	4
2	23 (8.4%)	2.83(±2.39)	8
3	41 (15.0%)	3.93(±3.41)	11
4	28 (10.3%)	4.11(±3.76)	13
5	50 (18.3%)	4.42(±2.89)	11
6	116 (42.5%)	4.44(±2.85)	12
Total	273 (100%)	3.99(±3.07)	13

Table II: Brushing habits in a sample of 63 children aged 1-6 years suffering from haemophilia

	Once	Twice	Not at all
No. of Children	134 (49.1%)	43 (15.8%)	96 (35.2%)

Discussion

This study is the first endeavor aimed at investigating the caries experience of haemophilic children in Pakistan. So far the oral health status of haemophilic patients and the obstacles faced by such special needs group is a research topic that has been neglected in the country.

As there has been no major dental health survey conducted in Pakistan at the national level, there is a scarcity of data to make comparisons between the findings of this study and the caries experience of the general population. However, a study carried out in Karachi amongst preschool children aged 1-6 years reports the mean dmft of their sample as 2.08.[17] This is significantly lower than the mean dmft observed in our study which reports the caries experience of haemophilic children as 3.99. The caries prevalence of 82.8% is also much higher than the 51% reported by Dawan et al.[17], in healthy children of the same age group.

These findings are in line with previous research carried out in Egypt which also reports that the caries prevalence in haemophilic children is much higher than their normally healthy counterparts.[20] However, a similar study concluded that the mean dmft score of normally healthy children in Northern Ireland is higher than haemophilic children.[11] The mean dmft value recorded in the current study of 3.99 was at par with the reported dmft score of Egyptian haemophilic children which was 3.35.[20] However, this dmft score was significantly higher than the reported dmft score of haemophilic children in

Northern Island as well as the United Kingdom.[11, 9] These discrepancies reflect the quality of oral health care and the effectiveness of the infrastructure & health services in developed countries. This also points out the tendency for seeking conservative treatment and greater awareness about oral health education and preventive measures among both healthcare professionals and haemophilic patients and their caretakers in these developed countries.

The analysis of dmft scores of this sample revealed the scores attributed to decayed components to be significantly higher than missing & filled components. Of all the children with caries experience, active decay was by large the most frequent observation whereas only a handful of children had their teeth treated for decay. This might have been due to either non-availability of treatment facilities or the reluctance of undergoing treatment on part of the patients.

This difference might also be due to the deficiencies in the dental services and dental care provided for the haemophilic in Pakistan. It is a well-established fact that dental management of haemophilic children requires meticulous and comprehensive planning which often requires collaboration with other fields of medicine.[14] The fear of a dentist in managing such patients can also be a factor in this regard. The inadequate training and skill building of oral healthcare professionals to deal with such special need's groups may also be a contributory factor towards the poor oral health status of Pakistani haemophilic patients.

The lack of proper facilities and treatment centers for haemophilic children is also another reason. Currently there are approximately only 15 recognized haemophilic centers in Pakistan which are often located in the larger cities, making it difficult for the majority of the population that resides in the rural areas to access these facilities. Moreover, only a few of these specialized haemophilic centers are providing dental care for this group.[21]

Providing haemophilic with dental care is complicated due to the fear of excessive bleeding in patients during procedures. Poor level of awareness, low income and unavailability of plasma also contributes towards the poor dental care provision to haemophilic patients in developing countries like Pakistan. Prevention of the dental diseases is the first step that should be taken for the dental management of haemophilic patients.[11] The ideal situation would be to have a close coordination between dental teams and haemophilia centers. This would allow readily available free plasma to be used, if needed, in dental procedures as this practice helps in providing smooth and efficient dental care to the haemophilic patients.[7]

The study suggests that lack of awareness, poor healthcare facilities, and lack of coordination of healthcare professionals maybe the contributing factors of poor oral health of haemophilic population in Pakistan.

Conclusion

It is evident from this research that pediatric haemophilic population of Pakistan has a higher dental caries experience than their normal healthy counterparts.

Recommendations: It is recommended that caretakers of haemophilic children should be made aware of the significance of preventive measures. Health infrastructure and healthcare facilities should be developed in a more systematic manner to facilitate the patients.

It is strongly recommended that further research work be carried out to explore this area further.

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