ORIGINAL RESEARCH

State of Dental Health and Management Needs of Young Hemophilic Patients: A Case-control Study

Swati Sharma[1], Ajoy K Shahi[2], Subhash Chandra[3], Nishath S Abdul[4], Bishnupati Singh[5], Rohit Singh[6], Ganiga C Shivakumar[7]

Abstract

Background: In particular, when it comes to systemic diseases like hemophilia, good dental health is crucial to a person's overall health and wellness. Through the means of this study, we aim to assess the prevalence of various dental anomalies in children suffering from hemophilia in comparison to healthy children and assess their treatment needs.

Materials and methods: This was a descriptive, case-control study with 400 subjects, 200 each in the study (hemophilic) and control (nonhemophilic) groups. The subjects' ages ranged from 5 to 15 years. Utilizing the oral hygiene index-simplified (OHI-S), the state of oral hygiene was documented (OHI-S). Using decaying extracted filled tooth (DEFT) and decayed, missing, and filled tooth (DMFT) for the primary and permanent dentition, respectively, teeth afflicted by dental caries and teeth restored/extracted as a result of dental caries were assessed. Statistical Package for the Social Sciences (SPSS) software (version 27.0) was used for statistical analysis.

Results: Hemophilic people had a considerably greater incidence of dental caries. Furthermore, even though their DMFT/DEFT and OHI-S scores were barely poorer than those of healthy people, children with hemophilia had a significantly larger percentage of dental treatment needs across all age categories than the other group.

Conclusion: The percentage of hemophilic children who needed dental treatment across different age groups was significantly higher than the other group, which supports our observations that the dental health status of hemophilic children was poor and treatment requirement was high among them as well. This is true even though the DMFT/DEFT scores and OHI-S scores in hemophilic children were only slightly worse than in healthy individuals.

Keywords: Caries, Dental health care, Hemophilia, Oral health, Oral hygiene.

International Journal of Clinical Pediatric Dentistry (2023): 10.5005/jp-journals-10005-2523

Introduction

One of the most difficult medical situations for medical professionals to treat is bleeding disorders.[1] The most prevalent disease among them is hemophilia. Hemophilia is an X-linked genetic condition that is brought on by a lack of clotting factors factor VIII and factor IX. Depending on the plasma levels of the coagulant, it may be severe, moderate, or mild.[2] The World Health Organization (WHO) claims that oral health is a crucial sign of overall health, happiness, and quality of life. Globally, 3.5 billion people are predicted to be affected by oral disorders, according to the Global Burden of Disease Study 2017.[3] The majority of studies favor tooth loss as one of the key indicators of oral health and as a variable.[4] The most prevalent oral diseases and the leading causes (85–90%) of tooth extraction are dental caries and periodontal disease.[5–7]

Children with hemophilia must be regarded as a separate category of patients due to the multiple effects it has on the patient's overall health.[8] In this population of patients, bleeding most frequently occurs in the oral cavity, which is a highly vascular location. This is especially true after tooth extraction, the exfoliation of deciduous teeth, or trauma to the oral mucosa.[9,10] More hemophiliacs than the control groups are affected by periodontal inflammatory illnesses, including gingivitis and periodontitis. The changes to the oral mucosa, especially the inflammatory states, might cause irreparable harm to the periodontium, including harm to alloplastic structures that were implanted to help patients recover.[11,12]

Due to the potential consequences of trauma or injury to the skin or mucous membranes and the resulting danger of bleeding, patients with hemophilia experience a psychological state of terror. Children with hemophilia are more prone than their healthy classmates to experience psychological issues.[13] In order to prevent

[1]Department of Pedodontics & Preventive Dentistry, Dental College, RIMS, Ranchi, Jharkhand, India

[2]Department of Oral & Maxillofacial Surgery & Oral Implantology, Dental College, RIMS, Ranchi, Jharkhand, India

[3]Department of Orthodontics & Dento-facial Orthopaedics, Dental College, RIMS, Ranchi, Jharkhand, India

[4]Faculty of Oral & Maxillofacial Surgery & Diagnostic Sciences, College of Dentistry, Riyadh Elm University, Riyadh, Saudi Arabia

[5]Department of Prosthodontics, Dental College, RIMS, Ranchi, Jharkhand, India

[6]Department of Pedodontics and Preventive Dentistry, Vananchal Dental College & Hospital, Garhwa, Jharkhand, India

[7]Department of Oral Medicine & Radiology, People's College of Dental Science and Research Center, People's University, Bhopal, Madhya Pradesh, India

Corresponding Author: Ajoy K Shahi, Department of Oral & Maxillofacial Surgery & Oral Implantology, Dental College, RIMS, Ranchi, Jharkhand, India, Phone: + 91 9955361090, e-mail: drajoyshahi@gmail.com

How to cite this article: Sharma S, Shahi AK, Chandra S, *et al.* State of Dental Health and Management Needs of Young Hemophilic Patients: A Case-control Study. Int J Clin Pediatr Dent 2023;16(2):380–387.

Source of support: Nil

Conflict of interest: None

bleeding episodes, hemophilic patients are reportedly scared to perform daily preventative measures in the right way, including brushing or flossing. It is also possible that hereditary coagulation problems are risk factors for oral diseases.[14] Due to ignorance, young patients, in particular, are more prone to bleeding.

Many hemophiliac patients have also encountered general dental practices that would not treat them. As a result, people could put off visiting the dentist until they require severe care. Similar to other patients, members in this category require routine dental treatment, and effective preventive practices, in particular, are crucial.[15]

Due to a lack of understanding about oral health care and a lack of awareness about developments in bleeding management, hemophilic patients and dental professionals have an excessive amount of dread of one another. Early intervention and proper counseling regarding oral hygiene practices are essential for minimizing difficulties in this population of individuals. The majority of minimally invasive dental procedures do not require factor replacement. The coordination of hematologists with patients with hemophilia undergoing extractions or subgingival periodontal treatment is necessary.

Need for the Study

Numerous studies have reported on surgical and periodontal management of hemophilic patients.[16–18] However, studies describing oral hygiene status, dental caries, and treatment needs of hemophilic children are still lacking. Moreover, the results of these studies are highly conflicting. Data obtained from some of these studies indicate alarming conditions of poor oral health status in hemophilic patients and suggested interventional strategies to combat oral diseases in this special group.[19–22]

Some studies, on the contrary, reported superior oral hygiene status in hemophiliacs as there was a significant influence of parental tooth brushing habits on children with hemophilia since the disease is hereditary in nature.[23–25] In a few studies, there was no significant difference in oral hygiene levels in hemophilic and healthy individuals.[26,27] The data on oral health status and treatment need in the young hemophilic patient is not available for Jharkhand and Eastern India. The data gathered on the oral hygiene index and dental caries prevalence can be helpful in determining whether bleeding disorders are risk factors for dental caries and poor oral hygiene status or not. It will also help the dentist in establishing preventive measures and effective dental management of patients with hemophilia. So, this study was conducted to compare oral hygiene status and dental caries status of hemophilic male children with that of nonhemophilic male children of same age group. Extensive research has discussed how hemophiliac patients are managed surgically and periodontally.[16–18] However, there is currently a paucity of publications detailing dental caries, oral hygiene conditions, and treatment requirements of hemophilic youngsters. The outcomes of these investigations are also incredibly contradictory. Data from a few of these studies point to concerning oral health issues in people with hemophilia and provide interventional tactics to treat oral disorders in this unique population.[19–22]

Some studies, however, have found that hemophiliacs have better dental hygiene than the general population since the disease is inherited, and parental tooth-brushing habits have a substantial impact on their children's oral cleanliness.[23–25] Few investigations found no discernible difference in oral hygiene practices between hemophiliacs and healthy people.[26,27] Eastern India and Jharkhand do not have statistics on the state of oral health and the need for treatment in young hemophiliac patients. It is possible to determine whether or not bleeding problems are risk factors for dental caries and poor oral hygiene status using the data collected on the oral hygiene index and dental caries prevalence. It will aid dentists in devising preventive strategies and efficient dental management of patients with hemophilia. Therefore, this study was carried out to compare and assess the oral health status of young hemophiliac patients in Ranchi, Jharkhand, India, with respect to healthy individuals, that is, nonhemophilic children.

Materials and Methods

Study Design

This descriptive case-control study was conducted for a period of 1 year on young male individuals' age ranging between 5 and 15 years divided into case (hemophilic) and control (nonhemophilic) groups.

This investigation of ours was carried out in Dental College, RIMS, Ranchi, Jharkhand, India and was registered with the Institutional Ethical Committee (IEC) of Dental College, RIMS, Ranchi, Jharkhand, India and obtained the IEC number—277/IEC/RIMS–23/06/21.

Eligible hemophilic children were selected randomly from a list generously provided by the Ranchi chapter of the Hemophilia Society, with whom this study was carried out as a collaborative effort. Proper age eligibility assessments, along with the relevant inclusion and exclusion criteria, were observed at the time of sampling.

Study Population

- Case group: Young male individuals suffering from hemophilia and registered with the Hemophilia Society, Ranchi Chapter.
- Control group: Young, healthy male individuals matched with the case group with respect to age and gender.

Sample Size Calculation

A total of 400 individuals were deemed to be a suitable sample size for our study. This sample size was determined according to the Cochran formula shown below:

$$\text{Sample size} = Z^2\, P\, (1-P)/\, D^2$$

where, N = minimum sample size, Z = coefficient of Z statistics obtained from standard normal distribution, P = Proportion (in %) Q = 1−P, and D = sample error tolerated (in %)

Hence, using a prevalence rate of 8.6%[28,29] at a confidence limit of 95% (D = 5%) and Z of 3.55, the minimum sample size (N) is calculated as

$$N = 3.55^2 \times 8.6\,(100-8.6)/5^2$$

$$N = 396.24$$

As a result, the study's minimum sample size (*N*) was to be kept around 400 male individuals, which should have sufficed the needs of our study.

Inclusion Criterion

Young male individuals in the age group of 5–15 years suffering from hemophilia for the study/case group and healthy children who were willing to participate through signed informed consent for the control group.

Exclusion Criterion

The study did not include any subjects with severe crowding, other hematological problems, or systemic diseases. People who refused

to participate or who did not sign informed consent were also excused from the investigation. The examination was carried out by a single examiner. OHI-S index, DMFT/DEFT index, and treatment need index recorded on standardized pro forma.

Statistical Analysis and Variability

Microsoft Excel was used to create the template, while SPSS was used to analyze the data (version 27.0). Depending on the data's normality, appropriate statistical parametric and non-parametric tests were used. Utilizing chi-squared testing, the prevalence of dental caries, oral hygiene status, gingival health, and data on prior dental history and oral hygiene practices were presented as proportions (Tables 1–5). When comparing dental caries experience and OHI-S between hemophilia patient and control groups, an independent-samples *t*-test or Mann–Whitney *U* test was used, depending on whether the data were parametric or nonparametric, as evident by the results shown in Tables 5A and B and 6A and B.

Results

Table 1, as given below, displays all the demographic characteristics of the participants enrolled in our study, such as age group, demographic location, frequency of dental checkups, and oral habits. The number of people in 5–7 years age group was 94, 8–11 years were 102, and 12–15 years 104 of the 300 individuals, 86 had once visited a dentist, 65 had twice, 42 thrice, and 48 had never visited. Around 81 individuals were from the urban area, 111 were from the periurban area, and 108 were from the rural domain.

Table 2, as shown below, displays all the demographic characteristics of the participants enrolled in our study, such as age group, their demographic location, frequency of dental checkups, and oral habits, as shown in Table 1, but only for the hemophiliac individuals that were a part of our study. The number of people in 5–7 years age group was 39, 8–11 years were 48, and 12–15 years 63 of the 150 individuals, 81 had a history of spontaneous oral bleeding, whereas 94 had a history of bleeding during brushing. A total of 29 individuals were from the urban areas, 65 from periurban areas, and 56 from the rural domains.

In the hemophiliac group, DMFT + DEFT frequency for 5–7 years was 45; for 8–11 years was 69 and for 12–15 years was 86. The OHI-S frequency for the 3 age groups was the same as DMFT/DEFT scores.

In the nonhemophilic group, DMFT + DEFT frequency for 5–7 years was 58; for 8–11 years was 63 and for 12–15 years was 79. The OHI-S frequency for the 3 age groups was the same as DMFT/DEFT scores.

In the case of the hemophiliac group, for the category "Children don't Require Treatment," the frequency was 8 for 5–7 years old, 12 for 8–11 years old, and 11 for 12–15 years old. For the "Preventive Care" category, the frequency was 33 for 5–7 years old, 44 for 8–11 years old, and 43 for 12–15 years old. For the "Fissure Sealant" category, the frequency was 15 for 5–7 years old, 14 for 8–11 years old, and 21 for 12–15 years old. For the "One Surface Filling" category, the frequency was 21 for 5–7 years old, 30 for 8–11 years old, and 35 for 12–15 years old. For the "Two or more Surface Filling" category, the frequency was 15 for 5–7 years old, 21 for 8–11 years old, and 29 for 12–15 years old. For the "Crown" category, the frequency was 32 for 5–7 years old, 38 for 8–11 years old, and 43 for 12–15 years old. For the "Pulp Care" category, the frequency was 29 for 5–7 years old, 34 for 8–11 years old, and 46 for 12–15 years old. For the "Extraction" category, the frequency was 33 for 5–7 years old, 21 for 8–11 years old, and 39 for 12–15 years old.

Table 1: Tabular representation of all the variables of the study participants involved in the investigation

Variable analyzed	*Variable characteristic*	*Frequency*	*Percentage*
Age group	5–7 years	124	31%
	8–11 years	132	33%
	12–15 years	144	36%
	Total	400	100%
Demographical location	Urban	89	22%
	Periurban	157	39%
	Rural	154	39%
	Total	400	100%
Consanguineous marriage	Yes	217	54%
	No	183	46%
	Total	400	100%
Frequency of tooth brushing	Never	33	8%
	Once a day	163	41%
	Twice a day	116	29%
	Several times a week	88	22%
	Total	400	100%
Frequency of visits to a dentist in the past 12 months	Once	115	29%
	Twice	86	22%
	Thrice	49	12%
	No visit	71	18%
	Never visited	79	20%
	Total	400	100%

Table 2: shown below shows the variables analyzed in the case (hemophiliac) group consenting for this study

Variable analyzed	*Variable characteristic*	*Frequency*	*Percentage*
Age group	5–7 years	45	23%
	8–11 years	69	35%
	12–15 years	86	43%
	Total	200	100%
Demographical location	Urban	43	22%
	Periurban	88	44%
	Rural	69	35%
	Total	200	100%
Consanguineous marriage	Yes	143	72%
	No	57	29%
	Total	200	100%
Type of hemophilia	VIII	168	84%
	IX	26	13%
	Others	6	3%
	Total	200	100%
Severity level	Mild	8	4%
	Moderate	31	16%
	Severe	161	81%
	Total	200	100%
Presence of hemophilic family member	Yes	29	15%
	No	92	46%
	Not available	79	40%
	Total	200	100%
History of spontaneous oral bleeding	Yes	124	62%
	No	76	38%
	Total	200	100%
History of bleeding during brushing	Yes	129	65%
	No	71	36%
	Total	200	100%

Table 3: Depicts the DMFT/DEFT and OHI-S scores for both the case (hemophiliacs) and control (nonhemophiliacs) groups consenting to this study

Type of group	*Variable analyzed*	*Variable characteristic*	*Frequency*	*Mean*	*Standard deviation*	*Standard error*
Case group (hemophiliac)	DMFT + DEFT	5–7 years	45	4.69	2.343	0.511
		8–11 years	69	3.64	1.743	0.390
		12–15 years	86	3.45	1.370	0.314
		Total	200	3.93	1.972	0.255
	OHI-S	5–7 years	45	1.23	0.763	0.167
		8–11 years	69	1.39	0.586	0.131
		12–15 years	86	1.91	0.872	0.200
		Total	200	1.51	0.776	0.100
Control group (nonhemophilic)	DMFT + DEFT	5–7 years	58	4.32	2.302	0.523
		8-11 years	63	3.56	1.723	0.345
		12–15 years	79	3.29	1.356	0.298
		Total	200	3.72	1.794	0.389
	OHI-S	5–7 years	58	1.19	0.755	0.161
		8–11 years	63	1.88	0.581	0.128
		12–15 years	79	1.89	0.863	0.213
		Total	200	1.65	0.733	0.167

Table 4: As seen below, gives the tabular representation of treatment needs of both the case and control groups according to age hierarchies

		Age group		
Type of group	*Variable analyzed in terms of treatment needs*	*5–7 years*	*8–11 years*	*12–15 years*
Case group (hemophiliac)	Children don't Require Treatment	8 (18%)	12 (17%)	11 (13%)
	Preventive Care	33 (73%)	44 (64%)	43 (50%)
	Fissure Sealant	15 (33%)	14 (19%)	21 (24%)
	One Surface Filling	21 (45%)	30 (44%)	35 (41%)
	Two or more Surface Filling	15 (33%)	21 (40%)	29 (33%)
	Crown	32 (70%)	38 (54%)	43 (50%)
	Pulp Care	29 (33%)	34 (49%)	46 (53%)
	Extraction	33 (72%)	21 (44%)	39 (46%)
Control group (nonhemophilic)	Children don't Require Treatment	15 (26%)	14 (22%)	19 (24%)
	Preventive Care	27 (47%)	36 (58%)	40 (51%)
	Fissure Sealant	23 (42%)	19 (32%)	46 (59%)
	One Surface Filling	28 (51%)	21 (34%)	53 (68%)
	Two or more Surface Filling	23 (42%)	35 (55%)	17 (22%)
	Crown	31 (56%)	27 (43%)	32 (41%)
	Pulp Care	16 (29%)	19 (32%)	35 (44%)
	Extraction	23 (42%)	21 (34%)	40 (51%)

Table 5A: Group statistics for DMFT/DEFT indices (where one refers to the case group consisting of hemophiliacs and two refers to the control group consisting of nonhemophilic individuals)

Variable analyzed	*DMFT score*	*N*	*Mean within the groups*	*Standard deviation*	*Standard error mean*
The mean value of the two groups	1	200	3.9267	0.66786	0.38559
	2	200	3.7233	0.53407	0.30835

Table 5B: Independent *t*-test results obtained for DMFT/DEFT indices (where one refers to the case group consisting of hemophiliacs and two refers to the control group consisting of nonhemophilic individuals)

		Levene's test for equality of variances		*t-test for equality of means*			
Variables analyzed		*F*	*Significance*	*t*	*Degrees of freedom*	*Significance (two-tailed)*	*Mean difference*
Type of variance assumed	Equal variances assumed	0.351	0.585	0.412	4	0.702	0.20333
	Equal variances not assumed			0.412	3.816	0.703	0.20333

In the case of the hemophiliac group, for the category "Children don't Require Treatment," the frequency was 15 for 5–7 years old, 14 for 8–11 years old, and 19 for 12–15 years old. For "Preventive Care" category, the frequency was 27 for 5–7 years old, 36 for 8–11 years old, and 40 for 12–15 years old. For the "Fissure Sealant" category, the frequency was 23 for 5–7 years old, 19 for 8–11 years old, and 46 for 12–15 years old. For the "One Surface Filling" category, the frequency was 28 for 5–7 years old, 21 for 8–11 years old, and 53 for 12–15 years old. For the "Two or more Surface Filling" category, the frequency was 23 for 5–7 years old, 35 for 8–11 years old, and 17 for 12–15 years old. For the "Crown" category, the frequency was 31 for 5–7 years old, 27 for 8–11 years old, and 32 for 12–15 years old. For the "Pulp Care" category, the frequency was 16 for 5–7 years old, 19 for 8–11 years old, and 35 for 12–15 years old. For the "Extraction" category, the frequency was 23 for 5–7 years old, 21 for 8–11 years old, and 40 for 12–15 years old.

Tables 5A and 5B represent the group statistics for DMFT/DEFT indices and the independent *t*-test results obtained on the basis of the findings as mentioned in Table 3 (where 1 refers to the case group consisting of hemophiliacs and 2 refers to the control group consisting of nonhemophiliacs).

The significance value, that is, the *p*-value > 0.5 in this case, which means it is not statistically significant and that the homogeneity assumption of the variance (DMFT/DEFT in this case) is met.

Tables 6A and 6B represent the group statistics for OHI-S scores and the independent *t*-test results obtained on the basis of the findings as mentioned in Table 3 (where 1 refers to the case group consisting of hemophiliacs and 2 refers to the control group consisting of nonhemophiliacs).

Discussion

The population's share of people with congenital hemorrhagic diatheses is quite minimal. Due to the fact that the majority of dentists lack experience treating oral problems in such people, treating these patients can be difficult for them.[30] As a result, hemophiliacs frequently have trouble getting basic dental treatment. The majority of hemophiliac patients can be treated in

Table 6A: Group statistics for OHI-S scores (where one refers to the case group consisting of hemophiliacs and two refers to the control group consisting of nonhemophilic individuals)

Variable analyzed	*OHI-S scores*	*N*	*Mean within the groups*	*Standard deviation*	*Standard error mean*
Mean value of the two groups	1	200	1.51	0.35553	0.20526
	2	200	1.6533	0.40129	0.23168

Table 6B: Independent *t*-test results obtained for OHI-S scores (where one refers to the case group consisting of hemophiliacs and two refers to the control group consisting of nonhemophilic individuals)

		Levene's test for equality of variances		*t-test for equality of means*				
Variables analyzed		*F*	*Significance*	*t*	*Degrees of freedom*	*Significance (two-tailed)*	*Mean difference*	*Standard error difference*
The type of variance assumed	Equal variances assumed	0.142	0.725	–0.463	4	0.667	–0.14333	0.30953
	Equal variances not assumed			–0.463	3.943	0.668	–0.14333	0.30953

The significance value, that is, the *p*-value > 0.5 in this case, which means it is not statistically significant and that the homogeneity assumption of the variance (OHI-S in this case) is met

a private dentist's office, though.[31] The possibility that moderate hemophilia may not be discovered until puberty if surgery, serious injury, or teeth extractions are avoided must be taken into account. Thus, a patient with hemophilia can occasionally receive the first diagnosis from a dentist. Patients who are hemophiliacs are a special population since standard dental care can be fatal for them.

Research shows that after experiencing severe mouth bleeding, 14% of all hemophilia patients and 30% of people with moderate types received their initial diagnoses.[32] Oral hemorrhage most frequently impacted the tongue and labial frenulum. Episodes of spontaneous bleeding can occur in patients during tooth brushing, food abrasion, or periodontal disease due to the profusion of enlarged capillaries on the surface of the weaker portions of the gingiva. Patients with congenital bleeding problems should place a high premium on maintaining good dental health.[25] However, hemophiliacs could require many trips to complete this task. Hematologists and dentists working together yield successful dental care for hemophilia patients.[33] For routine checkups and dental treatment, raising the factor level is typically not essential, but adequate coverage is required prior to and maybe after more involved operations like deep cleaning or the removal of heavy plaque/tartar.[34,35] However, there are specific instances where only community dental clinics or hospitals can provide patients with safe dental care [cervical dentin sensitivity (CDS)]. Only surgeries, extractions, and any dental procedures requiring inferior alveolar block anesthesia and lingual infiltration anesthesia require a referral to a hospital or CDS, according to "guidelines for dental treatment of patients with inherited bleeding disorders" (The World Federation of Hemophilia 2006).[36] Periodontal surgery must always be considered a high-risk procedure with a significant risk of blood loss in patients with bleeding issues. The difficulty of hemostasis can be greater than that of a simple extraction.[16]

The current study indicates that, with regard to the case group, the mean DEFT and DMFT of 4.69 is in the age range of 5–7 years, 3.64 in that of 8–11 years, and 3.45 in that of 12–15 years. According to the WHO, the mean DMFT at age 12 should not be >3.7.[9]

In a study, Boyd and Kinirons[37] discovered that primary dentition dental caries was somewhat more common in children with hemophilia than in controls. The DMFT and DEFT of children with hemophilia were also significantly higher than those of nonhemophilic children, according to Kabil et al.'s study in Egypt.[21]

Our results are consistent with those of Sonbol et al. study[25], which discovered that significantly more children with severe hemophilia l had no dental caries than did controls. The hemophilia group's DMFS and DMFT were somewhat higher than those of the controls. This could be a result of the fact that the dentist's office was situated adjacent to the outpatient hematology consulting room, where patients received dental care, and the dental service was considered to be a crucial part of the hematology visit.

The case groups for the current investigation scored poorly on the oral hygiene index simplified—12–15 years (1.91), 8–11 years (1.39), and 5–7 years (1.23). These findings were in line with a Polish study that discovered hemophiliac children had lower oral hygiene than control children.[38]

Our results contrast with those of a study by Zaliuniene et al.,[23] which revealed that overall results were better in deciduous dentitions, that is, children with hemophilia experienced less overall caries and required fewer dental treatments than their healthy peers. A substantial difference was discovered when the permanent dentitions of the hemophiliacs and controls were compared.

The mean DMFT score in the current study was 4.69 in the age range of 5–7 years, 3.64 in that of 8–11 years, and 3.45 in that of 12–15 years in the hemophiliacs, in contrast to the study conducted by Evangelista,[10] where the DMFT score was 0.9. This variation could be explained by the early identification of dental caries. The current investigation's findings did not agree with those of a study by Rodrigues et al.,[39] which discovered that the mean DEFT was 2.00 and that the study's reported high-need groups were hemophiliac children between the ages of 5–7 and 54% and 8–11. With the exception of crowns, which tend to become less necessary as individuals age, the most plausible explanation is that as people age, the prevalence of caries progression increases, and so do their treatment demands. Children aged 5–7 require more crowns than children aged 8–11 because caries spreads more quickly in mixed dentition.

In the current study, when looking at the hemophilic individuals in the 5-year-old age category, 73% of the participants

required preventative treatment, 33% required a fissure sealant, extractions of 72%, and pulp care 33%. The results of this investigation and the study by Sudhanshu et al. were in agreement.[9]

But the most noticeable statistic to come out of our investigation was the percentage of children that required dental treatment. Around 82% of the hemophilic individuals aged between 5 and 7 years, 83% of them in 8–11 years, and 87% of hemophiliacs in the 12–15 years age category were observed to require oral treatment/prophylaxis of some variety or more. The treatment protocols needed were the ones listed in Table 4, as well as others that were beyond the scope of our investigation. In comparison to the case group, the control group consisting of nonhemophilic individuals recorded 74, 78, and 76% of children in the 5–7, 8–11, and 12–15 years categories, respectively, were found to require oral treatment strategy of one or more sort. There was 8, 5, and 11% difference across the three age groups, respectively, between the case and control groups with respect to this parameter. This, along with the differences across other management protocols mentioned in Table 4 between the two groups, revealed that a higher percentage of hemophilic children required dental treatment in comparison to their healthy counterparts—an observation confirmed by two studies[8,19] done using similar methodological approaches as ours, though it has to be mentioned that the studies possessed smaller sample sizes compared to ours.

In terms of limitations, we believe that the involvement of more age groups would have led to better results, and the subsequent outcomes might have led to a better understanding of the correlation between hemophilia and the incidence of poor oral health among its sufferers. We believe there is a dearth of epidemiological studies on the state of oral health in hemophiliac patients. More thorough, extensive studies with varied methodological approaches are needed to completely understand the dental health of children with hemophilia and their plight.

Conclusion

Although the DMFT/DEFT scores and OHI-S scores are only noticeably worse in hemophilic children in comparison to the healthy individuals, the percentage of hemophilic children that require dental treatment across various age groups was significantly worse than the other group, which supports our observations that dental health status of hemophilic children was poor and treatment requirement was high among them as well. This decline in all aspects of oral health would, according to the author's opinion, would worsen as the sufferers would grow older, hence we believe dental professionals need to assess hemophilic individuals with much more caution. Better communication between hematologists, hospital dental specialists, and those in regular dentistry practices may be a key first step in creating effective dental management of patients with hemophilia.

Acknowledgments

We thank Haemophilia Society, Ranchi and Hemophilia Federation (India) for their support and help.

Orcid

Swati Sharma https://orcid.org/0000-0001-6302-4542
Ajoy K Shahi https://orcid.org/0000-0002-3120-8037

References

1. Kumar JN, Kumar RA, Varadarajan R, et al. Specialty dentistry for the hemophiliac: Is there a protocol in place? Indian J Dent Res 2007;18(2):48-54. DOI: 10.4103/0970-9290.32419
2. Mc Donald RE, Avery DR, Dean JA. Dentistry for the Child and Adolescent. Eighth edition. Elsevier (559-564).2004.
3. Lamster IB. The 2021 WHO Resolution on Oral Health. Int Dent J 2021;71(4):279–280. DOI: 10.1016/j.identj.2021.06.003
4. Kawachi I, Kennedy BP. Income inequality and health: Pathways and mechanisms. Health Serv Res 1999;34(1 Pt 2):215–227.
5. Oginni FO. Tooth loss in a sub-urban Nigerian population: causes and pattern of mortality revisited. Int Dent J 2005;55(1)17–23. DOI: 10.1111/j.1875-595x.2005.tb00027.x
6. Byahatti SM, Ingafou MSH. Reasons for extraction in a group of Libyan patients. Int Dent J 2011; 61(4):199–203. DOI: 10.1111/j.1875-595X.2011.00057.x
7. Passarelli PC, Pagnoni S, Piccirillo GB, et al. Reasons for tooth extractions and related risk factors in adult patients: a cohort study. Int J Environ Res Public Health 2020;17(7):2575. DOI: 10.3390/ijerph17072575
8. Reddy NV, Daneswari V, Chaithanya, et al. Oral hygiene status and treatment needs among hemophilic children in Telangana state and Andhra Pradesh state. Ann Med Health Sci Res 2017;7(Supl. 3):28–31.
9. Sudhanshu S, Shashikiran ND. Prevalence of dental caries and treatment needs among hemophilic children of Kota city, Rajasthan. Ann Ess Dent 2010;11(2):18–21.
10. Evangelista LM, Lima CCB, Idalino RCL, et al. Oral health in children and adolescents with haemophilia. Haemophilia 2015;21(6):778–783. DOI: 10.1111/hae.12717
11. Fiorillo L, Cervino G, Herford AS, et al. Interferon crevicular fluid profile and correlation with periodontal disease and wound healing: a systemic review of recent data. Int J Mol Sci 2018;19(7):1908. DOI: 10.3390/ijms19071908
12. Matarese G, Ramaglia L, Fiorillo L, et al. Implantology and Periodontal Disease: The Panacea to Problem Solving? Open Dent J 2017;11(1):460–465. DOI: 10.2174/1874210601711010460
13. Fiorillo L, De Stefano R, Cervino G, et al. Oral and psychological alterations in haemophiliac patients. Biomedicines 2019;7(2):1–13. DOI: 10.3390/biomedicines7020033
14. Zaliuniene R, Peciuliene V, Brukiene V, et al. Hemophilia and oral health. Stomatologija 2014;16(4):127–131.
15. Anderson JA, Brewer A, Creagh D, et al. Guidance on the dental management of patients with haemophilia and congenital bleeding disorders. Br Dent J 2013;215(10):497–504. DOI: 10.1038/sj.bdj.2013.1097
16. Srivastava A, Brewer AK, Mauser-Bunschoten EP, et al. Guidelines for the management of hemophilia. Hemophilia 2013;19(1);e1–e47. DOI: 10.1111/j.1365-2516.2012.02909.x
17. Shastry SP, Kaul R, Umar DG, et al. Hemophilia A: dental considerations and management. J Int Soc Prev Community Dent 2014;4(6):147–152.
18. Brewer AK. Advances in minor oral surgery in patients with congenital bleeding disorders. Haemophilia 2008;14(Suppl 3):119–121. DOI: 10.1111/j.1365-2516.2008.01717.x
19. Reddy KS, Reddy NV, Niharika P, et al. Oral Health Status and Treatment Needs among Hemophilic Children in Hyderabad, Telangana, India. Int J Clin Pediatr Dent 2019;12(1):30–32. DOI: 10.5005/jp-journals-10005-1585
20. Kumar M, Pai KM, Kurien A, et al. Oral hygiene and dentition status in children and adults with hemophilia: a case-control study. Spec Care Dentist 2018;38(6):391–394. DOI: 10.1111/scd.12324
21. Kabil N, ElAlfy MS, Metwalli N. Evaluation of the oral health situation of a group of Egyptian hemophilic children and their re-evaluation following an oral hygiene and diet education programme. Haemophilia 2007;13(3):287–292. DOI: 10.1111/j.1365-2516.2007.01440.x
22. Azhar S, Yazdanie N, Muhammad N. Periodontal status and IOTN interventions among young hemophiliacs. Haemophilia. 2006;12(4):401–404. DOI: 10.1111/j.1365-2516.2006.01305.x

23. Zaliuniene R, Aleksejuniene J, Peciuliene V, et al. Dental health and disease in patients with haemophilia–a case-control study. Haemophilia 2014;20(3):e194–e198. DOI: 10.1111/hae.12325
24. Jangra B, Goswami M. Assessment of dental caries experience and periodontal health status among children with haemophilia in New Delhi, India - a case control study. Oral Health Prev Dent 2017;15(2):131–137. DOI: 10.3290/j.ohpd.a37925
25. Sonbol H, Pelargidou M, Lucas VS, et al. Dental health indices and caries-related microflora in children with severe haemophilia. Haemophilia 2001;7(5):468–474. DOI: 10.1046/j.1365-2516.2001.00536.x
26. Kanjani V, Annigeri RG, Hanagavadi S, et al. Comparative analysis of oral health and treatment necessities in hemophilia individuals of Davangere population - a case control study. J Family Med Prim Care 2020;9(9):4774–4777. DOI: 10.4103/jfmpc.jfmpc_413_20
27. Othman NAA, Sockalingam SNMP, Mahyuddin A. Oral health status in children and adolescents with haemophilia. Haemophilia 2015;21(5):605–611. DOI: 10.1111/hae.12657
28. World Federation of Haemophilia (WFH). Report on the Annual Global Survey 2020. https://www1.wfh.org/publications/files/pdf-2045.pdf
29. John MJ, Mathew A, Tanuja T, et al. Demographic profile and real world data of persons with hemophilia in a resource constrained setup. CHRISMED J Health Res 2018;5:214–220.
30. Girolami A, Luzzatto G, Varvarikis C, et al. Main clinical manifestations of a bleeding diathesis: an often disregarded aspect of medical and surgical history taking. Haemophilia 2005;11:193–202. DOI: 10.1111/j.1365-2516.2005.01100.x
31. Fiske J, Ford HEP, Savidge GF, et al. The expressed dental needs of patients attending a haemophilia reference centre. J Disabil Oral Health 2000;1:20–25.
32. Sonis A, Musselman RJ. Oral bleeding in classic hemophilia. Oral Surg Oral Med Oral Pathol 1982;53(4):363–366. DOI: 10.1016/0030-4220(82)90436-4
33. Patton LL. Bleeding and clottingIn Greenberg MS, Glick M, editors. Burket's Oral Medicine Diagnosis and Treatment. 10th ed. Hamilton: BC Decker; 2003. p.454–p478.
34. Larsen PE. Dental management of the patient with hemophilia. (Letter) Oral Surg Oral Med Oral Pathol 1989;67:632–633.
35. WHO. Guidelines for the management of hemophilia. Published by the World Federation of Hemophilia ©World Federation of Hemophilia, 2005 Internet:www.wfh.org.
36. Brewer ACM. Guidelines for Dental Treatment of Patients with Inherited Bleeding Disorders. Montreal: World Federation of Hemophilia, 2006.
37. Boyd D, Kinirons M. Dental caries experience of children with haemophilia in Northern Ireland. Int J Paediatr Dent 1997;7(3):149–153. DOI: 10.1046/j.1365-263x.1997.00231.x
38. Zwain AMH, Ameen MMA, Al-Alousi WS, et al. Oral health status and caries related microflora among children with congenital coagulation disorders comparative study. JUBPAS 2012;20(1):335–342.
39. Rodrigues MJ, Luna AC, Lira SS, et al. Prevalence of dental caries and factors associated with caries in hemophilias. Rev Bras Hematol Hemoter 2008;30(2):114–119.