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Original Article

Transfusion Medicine Section

Quality of Life among Haemophilic Children in Central Madhya Pradesh, India: A Cross-sectional Study

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ABSTRACT

Introduction: Quality of Life (QoL) has recently become a focus of research in haemophilia, as children with haemophilia miss out on opportunities to reach their full potential during school and later in life. This leads to emotional and behavioural problems, family issues, and a decrease in Health-related Quality of Life (HRQoL). There is very limited data from the state of Madhya Pradesh, India, to assess the QoL in haemophilia patients.

Aim: To study the clinical profile of haemophilic children and assess their QoL.

Materials and Methods: The present hospital-based cross-sectional study was conducted in the Department of Paediatrics, Gandhi Medical College, Bhopal, Madhya Pradesh, India, from January 2019 to December 2019. A total of 49 children (Institutional incidence), aged from 4-12 years, with factor VIII/IX deficiency who presented in the Paediatric ward of the study Institution for factor transfusion, were included in the study. The study population was divided into two groups with children aged (group) and children aged 8-12 years (group II). A detailed clinical history was obtained from the accompanying parent/guardian, and QoL was measured using the Haemophilia QoL (Haemo-QoL) questionnaire. Scores achieved in each dimension, as well as, the total score were combined on a scale ranging from 0 to 100. High values indicate high impairment in QoL. The meanings of different scales like Standardised and Transformed Scale Scores (TSS) of Haemo-QoL were analysed using the student's t-test.

Results: In the present study, haemophilia A was more common than haemophilia B. All patients who attended the paediatric ward for factor transfusion were males, with a mean age of 8.37±2.56 years. It was also observed that the proportion of patients who were diagnosed early was significantly higher in the 4-7 years age group compared to the 8-12 years age group of patients (p-value<0.05). The present study revealed that the mean overall scores on the Haemo-QoL for the age groups 4-7 years and 8-12 years were 41.92±17.95 and 51.84±16.36, respectively. The highest impairment was in the physical health, school and sports, and family dimensions of QoL.

Conclusion: The QoL is poor among children in both age groups. The current study also showed that as age advances, the QoL of haemophilia patients becomes poorer.

Keywords: Emotions, Family support, Haemophilia, Physical health

INTRODUCTION

Haemophilia is a rare, chronic, X-linked recessive inherited disorder primarily affecting males [1]. Haemophilia is characterised by a deficiency of factor VIII or IX, causing a disturbance in coagulation activity [1]. Globally, the prevalence of haemophilia A is around 1 in 5000 male births, and for haemophilia B, it is around 1 in 30,000 male births [2]. In a 2015 annual global survey by the World Health Organisation (WHO), it was reported that there were around 17,500 haemophilia patients (83% haemophilia A) identified from India in this survey, which is likely an underestimate [3]. In high-income countries, the prevalence of mild, moderate and severe haemophilia is 40%, 15% and 45%, respectively, which is better than the 15%, 22% and 63% prevalence in low-income countries [4].

Quality of Life (QoL) is one of the most important focuses of research in haemophilia. The WHO defined QoL as individuals perceptions of their position in life in terms of the culture and value systems in which they live, and with respect to their goals, expectations, standards and concerns [5]. In an international multicentered West European study of children, it was indicated that there were differences in the QoL in various areas of study, and the QoL in patients from other countries was more impaired in the subscales of physical health, feelings, views, school and sports, and treatment. Results of this multicentered West European study indicate that impairment in QoL was different in various age groups [3]. Alongside the probable effect of haemophilia on different contexts on QoL, it could be possible that variable age groups might influence the QoL in a different form [4]. Moreover, it was shown that with the increase in age of haemophilia patients, the levels of QoL decreased [6].

Children with haemophilia lose opportunities to achieve their potential during school and later in life [7]. Individuals with severe haemophilia A (Factor VIII level ≤1%) experience frequent bleedings, often into soft tissues and joints, leading to joint damage. Repeated bleeding can lead to the development of target joints and arthropathy, as well as, pain, permanent deformities, loss of mobility and disability [8]. Moreover, joint bleeding results in emotional and behavioural problems, and family issues and impairs HRQoL [9]. In young patients with haemophilia, studies indicate lower physical functioning, bodily pain, general health and social functioning QoL compared to the general population [10].

Children with haemophilia and their parents need support in the form of a multidisciplinary team. This is challenging, especially in developing countries, where there is a lack of access to a multidisciplinary team that can provide contextualised, structured psycho-education programs and advice on haemophilia, recognising bleeds, adherence, home management, child care and parental self-care [11]. Additionally, there is very limited data from the state of Madhya Pradesh, India to assess the QoL in haemophilia patients. Hence, the present study was conducted to study the clinical profile of haemophilic patients and assess their QoL.

MATERIALS AND METHODS

The present hospital-based cross-sectional study was carried out in the Department of Paediatrics, Gandhi Medical College, Bhopal, Madhya Pradesh, India, from January 2019 to December 2019. Approval was obtained from the Institutional Ethics Committee (letter no 3567072/MC/IEC/2018 dated 5/11/2018). Written

informed consent was obtained from the parents of the children before including them in the study.

Inclusion criteria: Children aged between criteria: Children aged between and 12 years with factor VIII/IX deficiency who were attending the Paediatric ward for factor transfusion were included in the study.

Exclusion criteria: Patients younger than 4 years or older than 12 years, as well as, those with factor deficiencies other than factor VIII/IX, were excluded from the study.

Study Procedure

The study population was divided into two different groups as, group I with children aged 4-7 years and group II with children aged 8-12 years. Clinical history, including parameters such as demographic features, duration of symptoms, symptom profile, family history, age at the time of diagnosis, school absences due to haemophilia in the last year, and number of previous factor transfusions, was gathered from the accompanying parent/guardian.

The case was defined as a physician-diagnosed patient with haemophilia A or B, which was further verified through conditions for factor coverage usage records, records of laboratory diagnosis, factor assay levels, as per their available records and registration records. Mild, moderate and severe haemophilia were defined as those having factor levels of >5-40%, 1-5% and <1% of normal activity, respectively [12].

Haemophilia QoL (Haemo-QoL): The Haemo-QoL questionnaire was used to assess the quality of life among children with haemophilia [13]. This questionnaire was developed for children and adolescents with haemophilia by the European Haemophilia Care Centres and has sets of psychometrically tested questionnaires for different age groups of children. There are versions as self-reports for children: version I is for children aged 4-7 years old (21 items), while version II is for children aged 8-12 years old (64 items), with fewer items for younger children in the domains of physical health, feelings, views, family, friends, others, sports and school, and treatment. The questionnaire was expanded with one additional domain (global health). The reliability of this new domain was assessed by subject experts in the present study Institution. Group-II has, in addition, the domains of perceived support and dealing with haemophilia. Subjects scored each item on a 5-point scale according to how often they encountered problems during the previous four weeks (1=all the time, 2=often, 3=sometimes, 4=seldom, 5=never).

Because the number of items in each dimension differs in the two versions of the questionnaire for different age groups, raw scores were transformed on a scale of 0 to 100 to enable comparison between the age groups and the levels of disability in different dimensions. Higher scores on the Haemo-QoL reflect higher levels of impairment and thus lower levels of quality of life. According to the instructions given to the children, the time taken by them to complete the instrument was 20 minutes.

STATISTICAL ANALYSIS

All the data collected in the proforma were entered into the spreadsheets of Microsoft Excel 2007, a version developed by Microsoft Corporation in Washington. The data was then organised and tabulated. Statistical analysis was performed using GraphPad Prism version 8.0.1 by Graph Stats Technologies Pvt. Ltd. in Bengaluru, India. Non parametric data, such as the number of patients in two key age groups, were compared using Chi-square or Fisher's exact analysis. The means of different scales, such as standardised and TSSs of Haemo-QoL, were analysed using the Student's t-test. A p-value of less than 0.05 is considered significant.

RESULTS

A total of 49 children (Institutional incidence) were included in the study, with 20 children in the 4-7 years age group and 29 children in the 8-12 years age group. The mean age of the study participants was 8.37±2.56 years.

Out of the 49 cases of haemophilia, 36 (73.47%) cases were diagnosed with haemophilia A and 13 (26.53%) cases were diagnosed with haemophilia B. No statistical difference was observed when comparing the types of haemophilia in both age groups (p-value=0.8403). The Chi-square test showed that the proportions of patients who had an early diagnosis were significantly higher in group I compared to group II of patients (p-value=0.014). The proportion of patients who were absent from school due to the disease in the last 12 months was significantly higher in group II compared to group I (p-value=0.04). Additionally, the proportion of patients who had severe haemophilia was significantly higher in group II compared to group I (p-value=0.038) [Table/Fig-1].

Socio-demographic and other variables	Group I n (%)	Group II n (%)	p-value
Types of haemophilia			
Type A	15 (30.61)	21 (42.86)	0.8403
Type B	5 (10.2)	8 (14.33)	
Status of family history			
Present	13 (26.53)	13 (26.53)	0.1643
Absent	7 (14.29)	16 (32.65)	
Age at first diagnosis			
1st year	3 (6.12)	0	**0.014**
1-5 years	17 (34.69)	23 (46.94)	
6-10 years	0	6 (12.24)	
Absence from school			
Yes	6 (12.24)	17 (34.69)	**0.04**
No	14 (28.57)	12 (24.49)	
Types of joint involved			
Knee	9 (18.37)	16 (32.65)	0.3612
Ankle	2 (4.08)	3 (6.12)	
Elbow	1 (2.04)	3 (6.12)	
Hip	0	2 (4.08)	
Not involved	8 (16.33)	5 (10.2)	
Severity of haemophilia			
Mild	7 (14.29)	5 (10.2)	**0.0338**
Moderate	3 (6.12)	7 (14.29)	
Severe	10 (20.41)	17 (34.69)	

[Table/Fig-1]: Socio-demographic features between two age groups.
Chi-square test applied to calculate the p-values; The p-value in bold font was considered statistically significant

The mean TSS for physical health (p-value=0.0181), view of himself (p-value=0.0001), view of family (p-value=0.019), friends (p-value=0.0001), and others (p-value=0.0001) were significantly higher in group II compared to group I (p-value<0.05). Meanwhile, the mean of domains such as feelings (p-value=0.6961), school and sports (p-value=0.8994), treatment (p-value=0.6683), and global health (p-value=0.3617) were comparable between the two groups (p-value>0.05) [Table/Fig-2].

The domains of physical health (p-value=0.0178), view of self (p-value=0.0001), family (p-value=0.019), friends (p-value=0.0001), and other person (p-value=0.0001) had significantly higher mean Standardised Scale Score (SSS) in the 8-12 years age group compared to the 4-7 years age group (p-value<0.05). On the other hand, domains such as feelings (p-value=0.6947), school and sports (p-value=0.9091), treatment (p-value=0.6747) and global health (p-value=0.3617) had a comparable mean SSS in group I compared to group II (p-value>0.05) [Table/Fig-3].

Haemo-QoL	Transformed Scale Score (TSS)		p-value
	Group I (Mean±SD)	Group II (Mean±SD)	
Physical health	56.88±11.09	67.73±17.53	**0.0181**
Feelings	37.5±13.11	39.66±21.96	0.6961
View	26.88±13.62	49.62±9.61	**0.0001**
Family	50±15.71	59.83±12.57	**0.019**
Friends	27.5±7.69	46.12±7.55	**0.0001**
Perceived support (n=29)	--	38.36±10.92	--
Others	27.5±11.18	58.62±13.82	**0.0001**
School and sports	60.42±12.35	59.92±14.32	0.8994
Living with haemophilia (n=29)	--	57.27 ±5.61	--
Treatment	35.63±12.35	34.48±5.98	0.6683
Global health	55±15.39	58.62±12.09	0.3617
Mean	41.92±17.95	51.84±16.36	**0.0001**

[Table/Fig-2]: TSS for different Haemo-QoL dimensions between two age groups.
SD: Standard deviation; Student's t-test applied to calculate p-value

Haemo-QoL	Standardised Scale Score (SSS)		p-value
	Group I (Mean±SD)	Group II (Mean±SD)	
Physical health	3.28±0.44	3.71±0.7	**0.0178**
Feelings	2.5±0.52	2.59±0.88	0.6947
View	2.08±0.54	2.98±0.38	**0.0001**
Family	3±0.63	3.39±0.5	**0.019**
Friends	2.1±0.31	2.84±0.3	**0.0001**
Perceived support (n=29)	--	2.53±0.44	--
Others person	2.1±0.45	3.34±0.55	**0.0001**
School and sports	3.42±0.49	3.4±0.57	0.9091
Living with haemophilia (n=29)	--	3.29±0.22	--
Treatment	2.43±0.49	2.38±0.24	0.6747
Global health	3.2±0.62	3.34±0.48	0.3617
Mean	2.68±0.72	3.07±0.65	**0.0001**

[Table/Fig-3]: Mean SSS for different Haemo-QoL dimensions between two age groups.
Student's t-test applied to calculate p-value

The mean activity scores of SSS and TSS were comparable between Haemophilia type A and type B [Table/Fig-4].

QoL scores	Type of haemophilia		p-value
	Type A	Type B	
SSS	2.92±0.7	2.97±0.7	0.5921
TSS	47.91±17.5	49.23±17.87	0.5924

[Table/Fig-4]: SSS and TSS of all attribute affecting Quality of Life (QoL) between type A and B haemophilia.
Chi-square test applied to calculate the p-value

DISCUSSION

Haemophilia is a common heritable bleeding disorder. There is a heavy load of patients with haemophilia, as the prevalence of haemophilia is known to increase with better medical services and improved survival of patients. Although advancements in the management of haemophilia have shortened the life expectancy gap between haemophilic patients and normal individuals, they have led to a significant difference in the Quality of Life (QoL) of haemophilic patients [3].

In the present study, the authors found a greater number of patients with haemophilia A than haemophilia B. Among the 49 cases studied, 36 cases were diagnosed as haemophilia A, accounting for 73.47%, while 13 cases were haemophilia B, accounting for 26.53%. The observations published by the World Federation of Haemophilia (WFH) also state that haemophilia A is more common than haemophilia B, representing 80-85% of the total haemophiliac population. In studies by Mansouritorghabeh H, it was stated that Haemophilia A accounts for about 80% of all haemophiliacs [14].

In the current study, haemophilia A is more common than haemophilia B, which is consistent with other studies [6,7]. A total of 26 out of 49 cases (53.06%) came from "affected families," meaning those with a history of haemophilia in previous generations. They had siblings or maternal uncles suffering from the disease. A similar percentage was reported by Parthiban R et al., where 52.2% of the patients had a family history of haemophilia [8].

In the present study, the authors found that in the 8-12 years age group, 34.69% of children showed absence from school in the last 12 months due to the disease, while it was 12.24% in the 4-7 years age group. Additionally, in the 8-12 years age group, 10.2%, 14.29% and 34.69% had mild, moderate and severe haemophilia, respectively, while in the 4-7 years age group, the percentages were 14.29%, 6.12% and 20.41% for mild, moderate, and severe haemophilia, suggesting that the severity of the disease increases with age. This finding is consistent with various studies worldwide, indicating that as age advances, there is a limitation of physical activity affecting the Quality of Life (QoL) [15].

The results of this study revealed that the mean overall scores on the Haemo-QoL for age group I and II were 41.92±17.95, and 51.84±16.36, respectively. The highest impairment was observed in the physical health, school and sports, and family dimensions of QoL. It was found that group II had more impaired total Haemo-QoL scores compared to children aged 4-7 years. This finding indicates that age is a significant factor influencing QoL in the present study population, which is consistent with various other studies. Repeated episodes of bleeding can have long-lasting effects on a child's physical growth and development [16]. Thus, children with haemophilia tend to have a lower HRQoL compared to their healthy peers, especially those with severe disease [17].

The mean SSS of all subscales in all attributes was comparable in both type A and type B haemophilic patients. The mean TSS of all subscale scores was 47.91±17.5 in all children with type A haemophilia and 49.23±17.87 in all children with type B haemophilia. This indicates that the QoL is uniformly poor in children affected by both type A and B haemophilia [18].

Limitation(s)

The study resulting from a small sample of the population in the present study may not be applicable to a larger population, so there is a need to study a larger sample for generalisation. The age range was between 4 years and 12 years. Further studies are needed to determine the quality of life for all persons with haemophilia and to compare as many age groups as possible.

CONCLUSION(S)

The quality of life was poor among children in both age groups. It was also observed that as age increased, the QoL of haemophilia patients worsened. The major factors contributing to poor quality of life included the perceived impact of family, poor physical health, and inability to participate in school/sports activities. Support from family, friends, and others is crucial for maintaining quality of life. To improve haemophilia management and early diagnosis, priorities should be identified, such as training caregivers, establishing day care centers, initiating a registry, raising awareness among affected individuals and their families about the disorder, providing affordable factor concentrates, enhancing social awareness, and developing a comprehensive care and management team.

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