



FUNCTIONAL INDEPENDENCE SCORE IN HEMOPHILIA PATIENTS RECEIVING FACTOR THERAPY IN A TERTIARY CARE CENTER, ASSAM

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ABSTRACT **BACKGROUND:** Functional Independence Score in Hemophilia (FISH) is an assessment which is performance based and it helps in measuring the functional disability of the patient. The aim of the study is to assess the functional changes occurring in hemophilia patients using FISH score in using FISH score, in those receiving factor therapies and to hypothesize whether regular prophylaxis with factor minimizes joint bleeding and improves joint damage.

METHODS: It is a hospital based study done in department of pediatrics from the period of June 2018 to May 2019, where 35 hemophilia children of age group 4-18 years were recruited and followed up at 3 months interval based on inclusion criteria. They were assessed under seven heading. The data was entered in MS Excel and statistics was done with SPSS 23 software. P value <0.05 is considered as significant.

RESULTS: Mean age of the patients was 10.71 years. 48.57% had severe hemophilia, 28.57% had moderate hemophilia, 22.86% had mild hemophilia, 91.43% had hemophilia A and 8.57% had hemophilia B. The mean FISH score at presentation was 24.69±4.49. At subsequent presentations, at 1st interval mean FISH score was 29.66±2.52, at 2nd interval mean FISH score was 31.29± 1.25, at 3rd interval mean FISH score was 31.83±0.57.

CONCLUSIONS: Regular prophylaxis with factor showed a decrease in the frequency of bleeding episodes per year, and overall improvement in the functional status of the patient.

KEYWORDS : Hemophilia A, Hemophilia B, Functional Independence Score (FISH).

INTRODUCTION:

Hemophilia is a congenital bleeding disorder which is inherited as an X-linked recessive disorder. It is occurs due to deficiency of coagulation factors; factor VIII (hemophilia A) or factor IX (in hemophilia B) which results due to mutation of the respective clotting factor genes(1). Incidence of hemophilia A is 1 per 5000 live births and hemophilia B is 1 per 25,000 live births.(2)(3)

Hemophilia can be of three types. Mild hemophilia is characterized by 5 - <40 % (0.05-0.40IU/ml) of the normal factor level, in mild hemophilia, unless and until there is major trauma or surgery there may not be bleeding. Moderate hemophilia is characterized by 1-5%(0.01-0.05IU/ml) of normal factor level, in moderate hemophilia there may be occasional bleeding or prolonged bleeding due to minor trauma or surgery. Severe hemophilia is characterized by <1% (< 0.01IU/ml) of normal factor level. There is increased risk of spontaneous bleeding into joints or muscles in patients with severe hemophilia.(4)

The commonly affected joints in decreasing order of frequency are knee joint which accounts for one half of all hemarthrosis, elbow joint, ankle joint, shoulders and the wrists joint(5). These joints are called the 'index joint'. Frequent bleeding in one joint leads to the development of target joints, and these target joints are more prone to recurrent bleed which leads to the development of chronic arthropathy.

Prophylaxis with factor therapy reduces the risk of bleed, thereby prevents joint damage(6), possibly also reduces the risk of life threatening bleeds and the frequency of bleed. Due to physical and psychosocial impact of the disease, people with hemophilia may have a reduced quality of life(7).

Hence in this study, I'm going to study about the hemophilic patients and their functional independence score.

METHODOLOGY:

This study was conducted was a hospital based prospective study which was carried in the department of Pediatrics and hemophilia OPD, Assam Medical College & Hospital, Dibrugarh for a period of one year from June 2018 to May 2019. All children diagnosed as hemophilia A or B or C between 4-18 years attending the department of pediatrics and hemophilia OPD for factor replacement therapy were included in the study. Children and parents who are not willing to participate, the patients with one episode of bleed in the preceding 2 weeks of the assessment¹ and those with significant concomitant disease affecting joint status and function were excluded from the study. Informed and written consent were taken from the

parents/guardian after explaining properly about the study. Full history of the disease was taken from the guardians including personal information, age of diagnosis, family history, type of hemophilia, clinical presentations, age at 1st joint bleed, sites, and frequency of bleeding, whether taking factor regularly or on demand, number of bleeding episodes in a year. Clinical examination of the involved joints was done; the degree of loss of movement and functional status among hemophilia's was evaluated.

Data was collected by administration and assessment of FISH instructions and questionnaires. Functional Independence score in hemophilia (FISH) was developed by PM Poonnoose *et al*(8). All the patients were evaluated for seven activities. These activities were categorized under three categories i.e. (1) self-care: (Grooming, eating, bathing, dressing), (2) transfers: (from chair to floor), (3) mobility: Walking, running and climbing steps. Grading was done accordingly. Scoring is based on the four point Likert score according to the assistance required to perform the activity. 1. Unable to perform the activity 2. Need Assistance 3. Activity is performed but the individual is discomfort. 4. Activity performed normally. Overall the fish score ranged from 8-32 where 8=unable to perform any activity and 32=perform all activities normally.

Statistical Analysis:

After collecting data the data was entered in MS excel 2010 and analysis was done with the help of Statistical Package of Social Sciences (SPSS 23). The continuous variables were expressed in mean ± standard deviation and compared with ANOVA. Discrete data was expressed as numbers (%) and was analyzed using chi square test and Fisher's exact test. p value < 0.05 is considered as statistically significant.

RESULTS:

In our study, out of 35 cases, the age of the study group ranged from 4-18 years with a mean of 10.71 years. Out of 35 cases, 91.43% were male and 8.57% were female with a M: F ratio of 10.6:1. Out of 35 cases, 48.57% had severe hemophilia, 28.57% had moderate hemophilia, and 22.86% had mild hemophilia. 91.43% had hemophilia A and 8.57% had hemophilia B. Out of 35 cases, 14.29% were on episodic (on demand) treatment, 85.71% were on regular factor prophylaxis from the time of initiation of treatment. The mean average bleed per year before treatment with factor was 15.94%, range from 6-22 and the mean average bleed per year after treatment with factor was 9.29% range from 4-12. The mean age of 1st joint bleed in mild hemophilia was 5.5 years, moderate hemophilia mean age was 4.75 years; in severe hemophilia mean age was 3.9 years. In our study the knee joint was the most common joint involved in 85.71% cases

followed by elbow joint in about 54.29% cases and then ankle joint in 42.86% cases.

In Functional Independence score, at presentation out of 35 cases, according to the degree of independence only 11 cases were fully able to do two activities: eating and grooming, bathing, others needed assistance to do. 11 cases were fully able to do dressing. 12 cases were fully able to do chair transfers and 8 cases were fully able to squat. 21 of them were discomfort while performing chair transfer activity, 15 were discomfort while performing squatting. And in locomotion 11 cases were fully able to walk, 17 felt discomfort and 7 needed assistance to walk. Out of 35 cases 6 were fully able to climb stairs, 22 had slight discomfort to climb stairs, 7 needed assistance. Out of 35 cases, 6 of them were fully able to run, 14 cases were not comfortable to perform the activity without aid or assistance, 14 cases needed help to perform the activity and one was unable to perform the activity.

In the 2nd reading, which was taken after 3 months of the previous reading, out of 35 cases, 32 were fully able to perform three activities (Eating, grooming, and dressing). Out of 35 cases, 29 were fully able to perform chair transfer activity. 23 cases out of 35 were fully able to perform squatting activity. Out of 35 cases, one of them needed assistance for walking and stair climbing, 2 cases needed assistance for running.

In 3rd reading, out of 35 cases, all 35 cases were fully able to perform four activities (Eating & grooming, bathing, dressing and chair transfer). 32 out of 35 cases were fully able to squat, 33 out of 35 cases were fully able to walk and 2 of them needed assistance. 26 out of 35 cases were fully able to perform activity i.e., stair climbing while 9 felt discomfort while performing the activity. 25 out of 35 cases were fully able to run while 9 felt discomfort while performing.

In fourth reading, out of 35 cases all 35 cases were fully able to perform five activities (Eating & grooming, bathing, dressing, chair transfer and walking). Out of 35 cases, 34 were fully able to perform squatting while one was uncomfortable to perform the activity. 34 out of 35 cases were fully able to perform stair climbing, 1 felt uncomfortable to perform the activity. 31 out of 35 cases were fully able to run but 4 of them were uncomfortable while performing the activity and one of them needed assistance while performing activity. At the presentation out of 35 cases, 25 (71.43%) cases had FISH score between 8-27, and 10 (28.57%) had a score of >28, with a mean score of 24.69±4.49. At the 1st interval 7 (20%) cases out of 35 cases had FISH score between 8-27, and 28 (80%) had a score >28, with a mean score of 29.66±2.52. At the 2nd interval all 35 (100%) cases have a score >28 with a mean score of 31.29±1.25. At the 3rd interval also all 35 cases have a FISH score of >28 with a mean score of 31.83±0.57 (Table 1).

Table 1 Comparison Of Functional Independence Score With 1st, 2nd And 3rd Interval

Fish Score	At Presentation		1 st Interval		2 nd Interval		3 rd Interval		
	n	%	n	n	%	%	n	%	
Worst	7	0	0.00	0	0.00	0	0.00	0	0.00
Normal	8-27	25	71.43	7	20.00	0	0.00	0	0.00
Best	>28	10	28.57	28	80.00	35	100.00	35	100.00
Total	35	100.00	35	100.00	35	100.00	35	100.00	
Mean ± S.D.	24.69 ± 4.49		29.66 ± 2.52		31.29 ± 1.25		31.83 ± 0.57		
p value	<0.001								

DISCUSSION:

In our study, out of the 35 cases taken, the mean age of the patient was 10.71, this distribution is identical with findings with Abdel Ghany HM *et al* (9) where the mean age of the study group was 10.6 ± 2.95 years. In the study conducted by Tlacuilo-Parra A *et al* (10) the mean age of study population was 10.0±3.4years. In our study the maximum number of cases was from the age group of 4-10 years. Out of 35 patients, 91.43% of patients were male and 8.57% patients were female with a M: F ratio of 10.6:1. According to Petterson *et al*(11)¹³ since hemophilia is an inherited bleeding disorder, it follows a X linked recessive mutation so predominantly affects males. In our study there were 3 (8.57%) female patients. If the father is hemophilia and the mother is a carrier of hemophilia there is a 50% chance that the daughter will have hemophilia.

In our study, 91.43% belonged to hemophilia A and 8.57% belonged to hemophilia B. This is true as almost 85% accounts for hemophilia A.¹⁴

In a study conducted by Dr Devakumar *et al*(12) also found that out of 60 cases (86.7%) belonged to hemophilia A. In a study conducted by Abdel Ghany HM *et al*(9) also found that out of 30 cases (86.7%) belonged to hemophilia A.

In our study 48.57% have severe hemophilia, 28.57% have moderate hemophilia, and 22.86% have mild hemophilia. 14.29% patients on episodic (on demand) treatment, 85.71% patients were on regular factor prophylaxis from the time of initiation of treatment. In a study conducted by Saulyte Trakymiene *et al* (13) found that out of 21 pediatric cases 81.0% received regular prophylaxis treatment. In our study the parents or guardian of the cases being studied were well aware of the hemophilia disease and its treatment so maximum of them were on regular factor prophylaxis.

The mean average bleed per year before treatment with factor was 15.94, range from 6-22. The mean average bleed per year after treatment with factor was 9.29 range from 4-12. According to Manco-Johnson *et al* (14) in this study, prophylaxis with factor therapy was effective in reducing the frequency of joint bleed and total bleeding rates.

In our study, most common joint involvement was knee joint in about 85.71% cases followed by elbow joint in about 54.29% cases and then ankle joint in 42.86% cases. This finding is in agreement with a study conducted by Jansen *et al*(15)¹⁸ where he found that three joints (knee, ankle, elbow) were most commonly affected. Since the knee and ankle joint are weight bearing joints they tend to bleed more. Similar results were found in a study conducted by Gurcay *et al*(16) where knee joints were most commonly involved followed by elbows and ankles. In our study there was involvement of the shoulder and proximal interphalangeal joints in 2.86% cases. Contrasting results were found in a study done by Vikas Payal *et al*(17) in Jodhpur, India where the knee joint was most commonly affected, followed by the ankle joint then the elbow joint. In the study done by Abdel Ghany *et al*(9) knee joint was found to be more affected, followed by ankle and elbow joint. In our study, at presentation out of 35 cases, 71.43% had FISH score between 8-27, 28.57% had a score of >28, with a mean score of 24.69±4.49. At 1st interval 20% had a FISH score between 8-27, 80% had a score >28, with a mean score of 29.66±2.52. At the 2nd interval all 35 (100%) cases have a score >28 with a mean score of 31.29±1.25. At the 3rd interval also all 35 cases have a FISH score of >28 with a mean score of 31.83±0.57. There was a significant increase in FISH score at the time of presentation and 3rd reading. In our study, out of all seven activities, the activities which obtained the least score were squatting, running followed by step climbing. Similar studies observed in a study conducted by Gupta S *et al*(18) at SNS Medical College, Jaipur where the most affected tasks were squatting, running and step climbing. On follow up, it is seen that there was a significant increase in FISH score, and also improvement in functional independence of the patients. In a study conducted by M Badr *et al*(19), it was seen that FISH scores were higher in patients who had regular factor replacement.

Contrasting results were found in a study done by Tlacuilo- parra *et al*(10) where running was not affected instead walking was affected. In our study on follow up, it is seen that there was a significant increase in FISH score, and also improvement in functional independence of the patients.

CONCLUSIONS:

On follow up we found that with regular prophylaxis with factor there was a decrease in number of bleeding episodes per year. There was also an increase in FISH score and overall improvement in the functional status of the patient.

Limitations:

The sample size taken for the study was small (35 cases) and the study period is one year.

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