QUALITY OF LIFE IN PATIENTS WITH HAEMOPHILIA – QUALITATIVE STUDY

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Abstract
Haemophilia is hereditary disease that can affect the quality of life if the patient does not respect its limitations. Nowadays modern treatment can improve the quality of life. The aim of the study was to map which dimensions of quality of life are particularly affected by the disease. The sample consisted of four patients aged 14, 24, 40 and 60 with severe haemophilia type A. The research method was semi-structured interview. The results of the interviews indicate that the patients are the most limited in the physical area. In the symptomatology there predominated bladder and bleeding in the joints that lead to arthropathy in the elderly patients who experienced chronic joint pain. The risk of bleeding was reduced by a suitable choice of leisure time activities. They also had to adjust the disease to the selection of school and occupation. At the emotional level, there dominated the fear of establishing a family and of the gradual loss of self-sufficiency. The comparison of patient-to-patient responses indicated that to improve the quality of life, home-based treatment is a benefit. Owing to home-based treatment the hospitalisation, absenteeism at school and at work are decreased. With regard to maintaining the quality of life which is comparable to healthy people, an early education of parents and patients is important, focused on prophylactic activities. In childhood it is needed to educate about the proper administration of prophylactic treatment. The role of a nurse has a preventive and supportive character.

Keywords: Haemophilia. Quality of life. Restrictions. Support.

1 Introduction

Haemophilia is one of the rare hereditary diseases. It is currently the most common congenital coagulopathy. The disease occurs worldwide, racial addiction has not been identified. It is inherited bleeding disorder in which the blood does not clot properly [1, p. 145]. Haemophilia type A is caused by the deficiency of coagulation factor VIII and haemophilia type B is caused by the deficiency of coagulation factor IX. In 2015, there were 762 patients with haemophilia type A in all Slovak haematological outpatient clinics, of which 8 patients died and 29 patients were diagnosed for the other 12 months. 103 patients were treated as outpatients with haemophilia B, 1 died and 7 patients were diagnosed for the remaining 12 months. There were 48 patients with haemophilia with inhibitor, of whom 1 died and 7 new patients were diagnosed [2].

According to the amount of coagulation factor in the blood, haemophilia is divided into three degrees of severity, namely:

- Severe haemophilia (<1 %), for which is characteristic frequent bleeding in the muscles and joints.
- Moderate haemophilia (1-5 %), in which the bleeding occurs on average one month after the injury.
- Light haemophilia (5-40 %) where the bleeding occurs only as the result of severe injury or surgery [3, p. 117].

There is an opinion in amateurs that every small bleeding is the risk for haemophiliacs, but the greater problem is internal bleeding into the joints, muscles or soft tissues. These bleeds usually occur spontaneously, with no apparent cause of initiation. The most dangerous event is brain haemorrhage, which is one of the causes of haemophiliac death [4].

The cause of bleeding in haemophilia is the failure of secondary haemostasis. Although there comes to formation of primary thrombocyte a platelet plug is formed and and the formation of less thrombin and fibrin, the pathway of amplification of the coagulation fails due to the FVIII and FIX defect. The formation of thrombin is insufficient to produce a high-quality fibrin plug. Therefore, there is no complete and sustained bleeding interruption in a few minutes, although it will be reduced, it will not end spontaneously. Haemophilia inheritance is recessive in both cases and linked to sex chromosome X [5]. Examples of heredity are illustrated in the figures 1 and 2 [6].

The figure 1 illustrates the case of the father who is not diagnosed with haemophilia. It means that he has got two normal X and Y chromosomes. The mother is a haemophilia carrier, it means, she has one haemophilia gene on one chromosome X and one chromosome X is normal. Each daughter has a 50% chance to inherit the haemophilia gene from her mother and be the carrier. Each son has a 50% chance to inherit the haemophilia gene from his mother who passes down the gene of the disease to her sons.

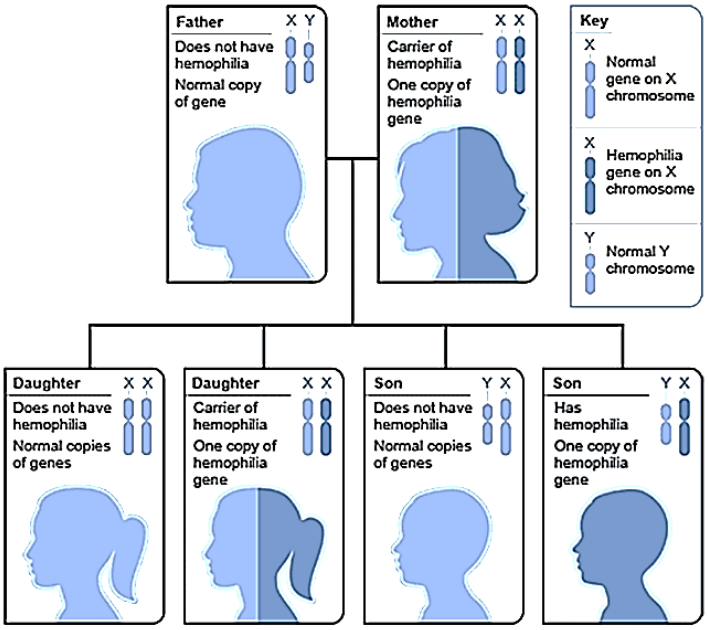

Fig. 1 *The haemophilia heredity model, when the carrier is the mother*

Figure 2 illustrates the case where the father is diagnosed with haemophilia. That means, he has a haemophilia gene on the X chromosome. The mother is not the one who passes the haemophilia gene, she has two healthy X chromosomes. In this case every daughter will inherit the haemophilia gene from her father and will be a carrier. None of the sons will inherit the haemophilia gene from their fathers, it means they will not be diagnosed with the disease.

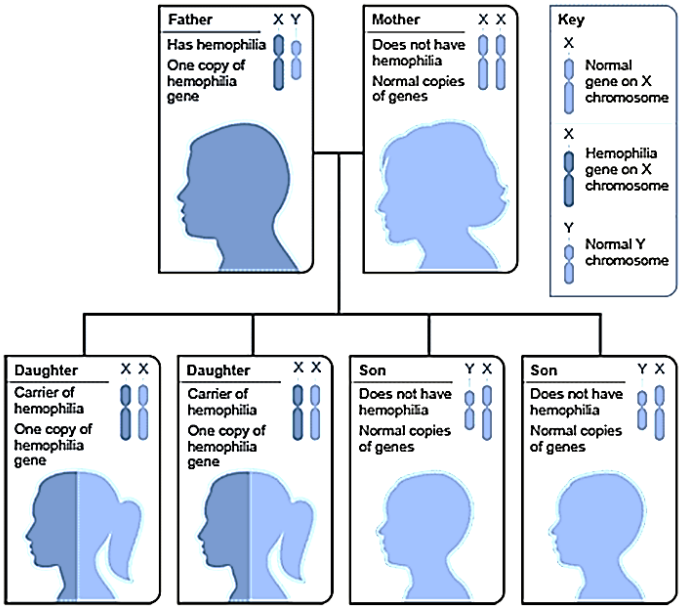

Fig. 2 *The haemophilia heredity model, when the carrier is the father*

From the aforementioned results that haemophilia is the disease of men. In women the incidence of the disease is rare. Women may have heterozygous sex-linked genotypes X^HX^H or homozygous chromosome X, for example Turner Syndrome (XO). In the case of a quarter to a third of the affected family history, the family history is negative, in the case of a new mutation or disability that is transmitted generically by women exclusively, with no clinical manifestations of the disease in men. The factor level, including the ratio of coagulation activity to the FVIII and FIX antigen, is the direct expression of genetic disability and in the members of one family they are usually the same [7, p. 244].

The clinical manifestations of both types of the disease directly correspond to the coagulation activity of plasma factors and are not related to the antigen. Usually, during the second year of life, the bleeding into the joints, which is one of the major symptoms of the disease, occurs in severe haemophilia. As a result, there are joint

deformities that further lead to disturbances in the momentum and partial to complete immobility of the patients. Haematuria and haemorrhage often occur in haematopoietic stem cells. Any even minor head injury should be considered a potential bleeding, and even negative trauma findings do not exclude them. The procedure must condinue as if the bleeding was not present. Other localisations are less common, but they are not less dangerous, for example bleeding into the digestive system [1, p. 146]. Moderate haemophilia sufferers usually do not have spontaneous bleeding, but there can be present bleeding into the muscles or joints (depending on the factor level) after minor injuries. In light haemophiliacs, bleeding occurs in wounds or surgical, most often dental procedures. Rarely there occur the causes of nosebleeds and skin petechia (typical for primary haemostasis). Women carriers may also be at risk of bleeding if they have a factor of less than 30 to 40 % [7, p. 245].

The most important diagnostic tests in laboratory coagulation assays include activated partial thromboplastin time (APTT), which is prolonged with a fall of FVIII and FIX below 30 %. By determining the coagulation activity of FVIII and FIX, the diagnosis can be confirmed [3, p. 119].

To identify the causal mutation, it is essential to perform a molecular biological examination in all hard haemophiliacs. For each newly diagnosed haemophilia patient, a 2-fold level of FVIII and FIX coagulation activity should be investigated and the FVIII and FIX inhibitor should be excluded. It is also necessary to perform a genetic examination to focus on haemophilia carriers in fertile age in the family [7, p. 245].

The treatment of haemophilia is a substitution treatment by blood derivatives. For haemophilia A, a FVIII concentrate is administered and concentrate IX for haemophilia B. If the concentrate IX is not available, a prothrombin complex concentrate may be administered. In case of haemophilia A, cryoprecipitate was used in the past and fresh frozen plasma was used in haemophilia B. Currently are used FVIII and FIX plasma concentrates which are highly purified and virus-treated. To eliminate the risk of infection, recombinant concentrates FVIII and FIX have been developed, which should be reserved for newly born, untreated, and blood vessels of uninfected haemophiliacs. The dose of the administered concentrate depends on the the importance of haemophilia, bleeding and surgery which is planned. According to the methods of coagulation factor substitution, the treatment on demand and prophylactic treatment are distinguished. The treatment on demand is the application of FVIII or FIX according to bleeding [3, pp. 119-120]. The treatment on demand has the following advantages lower treatment costs and less applied injections; as well as the disadvantages such as an increased risk of spontaneous bleeding and an increased risk of joint damage [8]. The prophylactic treatment is primary, which means that a factor concentrate is regularly applied within 2 years or at the latest after the first bleeding into the joints. If a factor concentrate is applied later than after the first bleeding, then it is secondary prophylaxis. Prophylaxis can also be used in the short term after severe bleeding or surgery. This type of treatment is used in severe forms of haemophilia to prevent joint damage that is more susceptible to bleeding in childhood than in adulthood. Also prevent life-threatening bleeding. The aim of prophylaxis is to keep FVIII and FIX level > 2% [3, pp. 119-120]. The advantage of prophylactic treatment is that it reduces the risk of spontaneous bleeding, allows the patients to participate in sports activities and reduces the risk of joint damage. The disadvantages of this treatment are frequent injections and high financial costs [8].

In the easier form of haemophilia A, an antidiuretic hormone analogue – DDAVP may also be used in therapy. With this hormone, endogenous FVIII can be released, which may be sufficient for lighter bleeding or dental extractions. Antifibrinolytics (for example Exacyl and Pamba) are used as a supportive treatment for bleeding especially from oral cavity or dental extractions [7, pp. 246-248].

The main complication of treatment is the development of so-called inhibitors of clotting factors. Inhibitors are produced because the body reacts to the factor concentrates used for the treatment of patients as to foreign substances and activates the patient´s immune response directed to the extermination of foreign substances [9]. Another complication in treatment is infection. In spite of various modifications of plasma coagulation factor concentrates, the reduction in the risk of infection can not be 100% eliminated [7, p. 248].

2 Goals

The aim of the study was to find the effect of the disease on the selected dimensions of the quality of life in relation to the age of the patient.

3 Method

The method of the study was a semi-structured interview that consisted of 4 domains. It focused on the following dimensions: physical, mental, social and working life. The interviews were conducted in February 2018 in the home environment of patients, ranging from 90 to 120 minutes. Patient responses were recorded in writing form and subsequently analysed.

4 Sample

The sample consisted of four patients diagnosed severe haemophia type A. The selection was narrowed to the patients with haemophilia in the Trencin region. The criteria of selection were disease, age, and willingness to cooperate.

5 Results

The results of the study are recorded in the tables with an emphasis on the answers of the respondents representing the selected dimensions of the quality of life dimensions.

Table 1 *Physical dimension of quality of life*

	Lukáš 14 years old	Tomáš 24 years old	Jozef 40 years old	Pavol 60 years old
Clinical manifestations of haemophilia	Bruises after an injury.	Bruises after an injury.	Arthropathy.	Arthropathy.
Spontaneous bleeding	2-3 times a year in the joints.	2-3 times a year in the joints and nose.	3-4 times a month in the joints.	3-4 times a month in the joints.
Pain	Does not feel.	Knee pain, elbow and wrist pain, intensity on VAS scale (10) 3-5, after exertion.	Chronic pain of knee, ankle and elbow joints, intensity on the scale VAS (10) 4-5.	Chronic pain of knee, ankle and elbow joints, intensity on the scale VAS (10) 4-5.
Self-care	Full independence.	Full independence.	Full independence.	Full independence in daily activities. Partial dependence in instrumental daily activities: shopping and homework.
Sport and leisure activities	Sports (skiing and parkour), playing a musical instrument, dancing in a folk ensemble.	Cycles, strengthens his body – develops muscles.	Does not practice sports activities. Prefers walking, PC, theater goer.	Step workout at home. Prefers walking.
Awareness	Declares enough information.	Declares enough information.	Declares enough information.	Declares enough information.

In all participants – within the domain of physical activity – the disease was manifested by spontaneous bleeding into the skin and joints. With increasing age, the symptoms of atrophy and the presence of chronic pain-intensifying pain appeared. Younger participants perform sports activities, the youngest one without restriction, even though he knows that sport threatens his joints. In the prevention of bleeding, it is necessary for patients to perform lighter sports such as swimming, cycling, light gymnastic exercises, stretching and hiking [10]. In the domain of ordinary daily activities, everyone was self-sufficient, a 60-year-old patient had moderate restrictions on household maintenance and purchases. All the participants declared enough information, they were interested in news and available materials.

Table 2 *Mental dimension of quality of life*

	Lukáš 14 years old	Tomáš 24 years old	Jozef 40 years old	Pavol 60 years old
Emotions	Occasionally anger and sadness.	Fear from heredity.	Fear from heredity.	Acceptance and reconciliation.
Social disadvantage	Is not present.	Is present.	Is present.	Is not present.
Plans for the future	Become a journalist or a musician.	To be healthy, plans to set up his family.	Be self-sufficient. Be able to keep moving. He does not have any plans to set up his family.	Be self-sufficient. Be able to keep moving.

All the participants had to deal with the diagnosis of haemophilia. There is a clear impact of age. While the young patient experienced emotions of anger and sadness about the illness, the oldest patient accepted and reconciled these changed conditions of life. The patients in productive age were afraid of heredity and establishment of their own family, and they perceived their illness as the disorder or disability. Their future plans were reduced to "be self-sufficient" according to their age.

Table 3 *Social dimension of quality of life*

	Lukáš 14 years old	Tomáš 24 years old	Jozef 40 years old	Pavol 60 years old
Seeing people with the same diagnosis	Once a year	Once/twice a year	Year-round	Once a year
Impact on the selection of school	Partially	Partially	Distinctly	Distinctly
Absent from school due to illness	At all	Partially	Distinctly	Distinctly
Family background	Good	Good	Good	Good

From the social aspects, there is a clear need to meet people with the same diagnosis at different time intervals. 14 years old Lukáš regularly attends summer camps for haemophiliacs. Older participants keep in touch with other patients through the meetings at the Slovak Haemophilia Association at various meetings and lectures. They themselves are active members. 60 years old Pavol annually performs relaxing physiotherapist activities at the spa. The social background of patients with haemophilia is good. School absenteeism is reduced in connection with advancement in treatment and the possibility of prophylactic treatment in home environment. The elderly patients (Jozef and Pavol) indicated problems during their schooling due to their frequent absences but also due to their reluctance to accept the limitations that result from their illness. 40 years old Joseph was forced to attend school for children with disabilities. The disease affects the choice of middle school and employment, and patients have to accept it, although they perceive some compulsory choices of careers as unfulfilled dreams. Paul was denied to study medicine.

Table 4 *Dimension of quality of working life*

	Tomáš 24 years old	**Jozef 40 years old**	**Pavol 60 years old**
Limitations in the choice of the profession	Yes	Yes	Yes
Job	Sedentary, IT technician	Sedentary, administrative force	Retired, formerly a pharmacist
High sickness absence	No	No	Was not
Limitations at work	Yes	Yes	Yes

The patients, 24 years old Tomáš, and 40 year old Jozef, can not perform physically hard work. Tomáš worked in the past as a truck driver and waiter, but also during the performance of these jobs he felt a lot of physical burden and did not manage the job. Jozef worked as an electrician, which was also unsatisfactory. The jobs which are not so much physically demanding seem suitable for haemophiliacs. Tomáš works as an IT technician, Jozef as an administrative worker, and Pavol worked as a pharmacist.

The quality of life of patients with haemophilia is chiefly affected by the physical dimension. This is evidenced by several studies. Ferreira et al. (2013) found that the quality of life of patients was mainly affected by the presence of arthropathy. He also pointed to an increased risk of blood-borne diseases [11]. Taha et al. (2014) also emphasised joint bleeding as the most deteriorating quality of life in younger children. The more common the bleeding in the joints, the worse the quality of life [12]. Currently the emphasis is on prophylaxis; regardless of the age of the patient, this concerns not only children but also elderly patients.

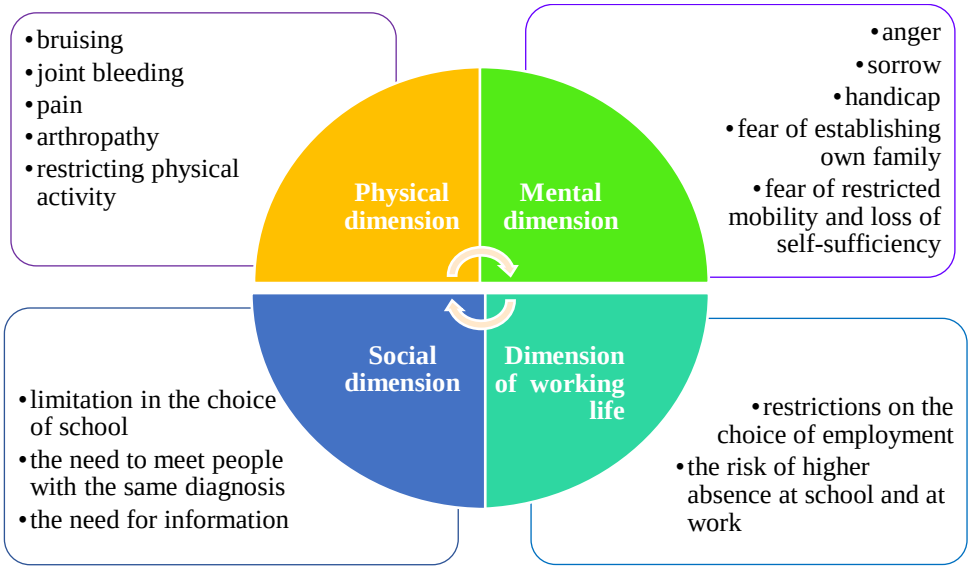

Figure 3 *Impact of haemophilia on the quality of life*

Arthropathy can not be reversed in the elderly haemophiliac patients, but further damage and spontaneous bleeding can be reduced. Prophylactic treatment allows the patients to live a full life. While such treatment was available, about a third of heavy haemophiliac children were absent from school 25 % of school attendance [13, p. 173]. Despite the potential for prophylactic treatment, the severity of the illness can not be underestimated and it is essential to adapt the lifestyle to avoid unnecessary complications and reduce the quality of life.

6 Conclusions

The average life expectancy of haemophiliacs was less than twenty years at the beginning of the 20th century. Nowadays, haemophilia is well curable and individuals have a chance to live the age of a regular population, even to live a full life with proper treatment and lifestyle.

The following helps to maintain the quality of life of haemophiliac patients which is comparable to healthy populations:

- Prophylactic treatment is ideal in a home environment, regardless of the age of the patient.
- Education about the nature, manifestations and treatment of the disease, about risky activities that increase the possibility of bleeding, and about modified lifestyle.
- Psychological support from family, friends and medical staff.
- Supporting activities from the associations of haemophiliacs – organisation of summer camps for children suffering from haemophilia, stays at the spa or camps for haemophiliacs, meetings, seminars, lectures and counseling.
- Good social background.
- The selection of proper forms of physical activity.
- The selection of appropriate, physically undemanding job.
- The right attitude of patients and their environment to the disease, perceiving it not as a disorder or disadvantage, but as a lifestyle.

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