

## Orthopaedic Status and Surgical Needs of Patients with Haemophilia in Algeria

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### ABSTRACT

*Despite the availability of factor replacement to manage acute bleeding in haemophilia, haemarthrosis may occur due to delayed therapy or lack of detection, leading to joint damage. Orthopaedic surgery is one option to help improve patient quality of life. Assessment of current treatment patterns is required for physicians to optimize long-term management of patients; however, there are few studies available to determine the real-life situation in African/Middle-Eastern countries, such as Algeria.*

*This was a multicentre, retrospective study of patients with haemophilia treated with on-demand factor replacement. Seven haematology centres in Algeria provided evaluable clinical data for 536 patients, including joint status and requirement for surgical intervention.*

*Surgery was recommended in 326 (61%) patients (239 patients with severe haemophilia, 79 moderate and eight mild). Surgical procedures per patient age group were: 11 in patients ≤5 years, 34 in 6–10 years, 169 in 11–20 years, 183 in 21–30 years and 122 in ≥31 years. 14% of all procedures involved joint replacement, 56% other major surgeries and 30% minor surgeries (synoviorthesis). Minor surgery was most common in younger patients, while major surgeries increased proportionately with patient age.*

*In Algeria, insufficient use of factor replacement has led to many patients with haemophilia experiencing haemarthrosis, leading to joint damage requiring surgery. This study aids assessment of the scale of the problem and identification of the surgical needs of patients. This may help plan targeted resourcing for patients most at risk of long-term disability and those likely to benefit from earlier surgical intervention.*

## INTRODUCTION

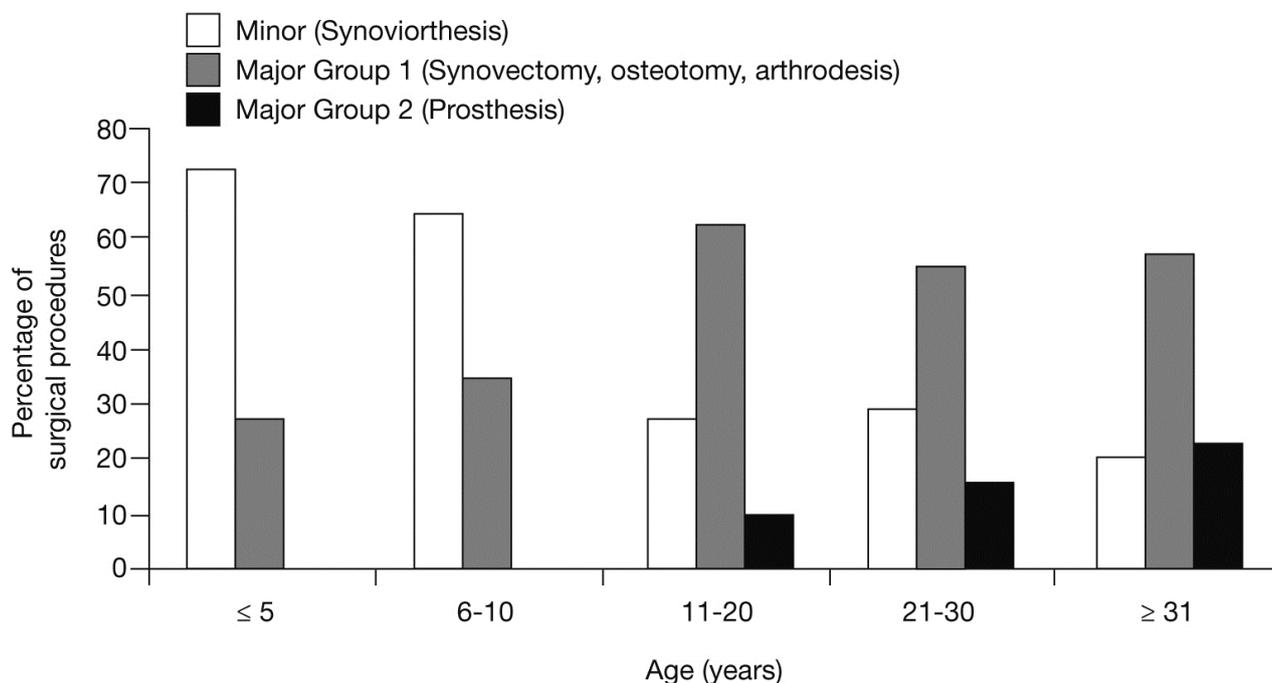
A major complication in patients with haemophilia is joint damage associated with recurrent intra-articular bleeds. Frequent haemarthrosis affecting target joints can culminate in irreversible, disabling arthropathy, impeding quality of life (QoL) [1]. Despite the availability of on-demand treatment with Factor (F) VIII or IX to manage acute bleeding episodes, haemarthrosis may occur when treatment for bleeding is not effected rapidly, or may proceed without detection. In both instances unchecked bleeding initiates a sequence of events leading to destruction of joint cartilage. Assessing the use of prophylaxis and on-demand treatment versus surgical outcomes is essential if physicians are to optimize the long-term management of their patients; however, there are few studies available to determine the real-life situation in African/Middle-Eastern countries, such as Algeria.

## MATERIALS AND METHODOLOGY

In 2008, a retrospective review of demographic and clinical data from 536 registered

patients with haemophilia in seven major haemophilia centres in Algeria (Algiers, Sétif, Annaba, Oran, Sidi Belabes, Tlemcen and Batna – treating 47% of all patients receiving treatment in Algeria) was carried out. All patients were being treated with on-demand FVIII or FIX for the management of acute bleeds. Each centre also provided an evaluation of patient orthopaedic status and the requirement for orthopaedic intervention. Three definitions of surgical intervention were used: minor surgery (synoviorthesis); Group 1 major surgery (synovectomy, osteotomy or arthrodesis); and Group 2 major surgery (joint replacement with a prosthesis).

All data were requested and collected via an anonymous postal questionnaire and all analyses of data were descriptive. The study was not designed or powered to detect statistical differences between groups of patients. All patient data reviewed were anonymous and the study was conducted in accordance with the Declaration of Helsinki and the Guidelines for Good Epidemiology Practice. No local approval is required for such studies in Algeria.



**Figure 1.** An assessment of the percentage of surgical procedures according to type and patient age.

## RESULTS AND OBSERVATIONS

The majority of patients (61%; n=326/536) required surgical intervention for joint disease.

Most patients (n=239) had severe haemophilia (<1% factor activity), while 79 had moderate (1–5% factor activity) and eight mild haemophilia (5–40% factor activity). The age at which surgery was

considered was relatively young: approximately 3% were aged  $\leq 5$  years; 9% were aged 6–10 years; 32% were aged between 11–20 years and 35% were aged 21–30 years. Less than one-quarter (21%) were aged  $\geq 31$  years. The number of surgical procedures per patient age group was also high in the younger cohorts, with 11 operations being performed in patients aged  $\leq 5$  years, 34 in patients aged 6–10 years, 169 in patients aged 11–20 years, 183 in patients aged 21–30 years and 122 in patients aged  $\geq 31$  years.

Fourteen per cent of all required procedures were Group 2 major surgeries, 56% were Group 1 major surgeries (synovectomy, osteotomy or arthrodesis) and 30% minor surgeries (synoviorthesis). Assessment of the percentage of surgical procedures according to type of surgery and patient age highlighted that minor surgery was the predominantly recommended option in younger patients, while the need for Group 1 and Group 2 major surgery increased proportionately with increasing patient age (Figure 1).

## DISCUSSION

It is well established that early intervention in haemophilia is important in order to manage and prevent lasting joint damage, and priority should be given to minor surgery in patients under the age of 11 years, followed by Group 1 major surgery in patients aged 11–20 years. All case data recommended that Group 2 major surgery should be discussed in detail with an orthopaedic surgeon, taking into account factors such as the average lifespan of most joint prosthetic devices, which is around 10 years [2, 3].

In accordance with such recommendations, minor surgery was more common in younger patients in the Algerian cohort. The majority of surgeries in patients  $\leq 5$  years and 6–10 years were minor (72.7% [n=8/11] and 64.7% [n=22/34], respectively) and the majority of surgeries in patients aged 11–20 years and 21–30 years were Group 1 major surgery (62.7% [n=106/169] and 55.2% [101/183]). However, Group 1 major surgery was still recommended in 27.3% of patients aged  $\leq 5$  years and in 35.3% of patients aged 6–10 years. Also, 10.1% of patients aged 11–20 years and 15.8% of patients aged 21–30 years were undergoing Group 2 major surgery.

There are some limitations associated with this analysis, including the lack of data on patient outcomes following the recommendation for surgical procedures (e.g. validation or success rates); however, it is extremely interesting to note that only 14 patients (nine with severe haemophilia, three with moderate and two with mild) were inhibitor patients. Of these, seven were aged 21–30 years, six were older than 30 years and one was aged between 11 and 20 years. The number of inhibitor patients may have been underestimated since in two-thirds of the patient cases provided, details relating to the presence or otherwise of inhibitors were not provided.

There may also have been low implementation of primary prophylaxis in severe patients or insufficient use of rapid, on-demand FVIII and FIX, which has led to a situation in Algeria where many patients with haemophilia have experienced haemarthrosis, leading to joint damage requiring surgery.

Prophylaxis has been used to treat severe haemophilia for many years, and is recommended by organizations such as the World Federation of Haemophilia [4]. Coppola et al (2008) have recently discussed the benefits of prophylaxis in children, highlighting that primary prophylaxis should be started before the age of 2 years and after no more than one joint bleed; these recommendations are based on studies which showed that prophylaxis started in patients  $\leq 2$  years old was associated with fewer joint bleeds compared with patients who started prophylaxis later [5, 6]. Comparisons of prophylaxis with on-demand treatment in Norway and Sweden showed that prophylaxis was associated with fewer surgeries; however, differences were found in factor-concentrate consumption, duration of use and speed with which on-demand treatment was given [7].

The importance of preventing long-term joint damage in order to ensure functional mobility and QoL in patients with haemophilia is essential. Ideally, joint health should be preserved and bleeds prevented so that surgery is not needed. Whilst there has been improved use of on-demand therapy in Algeria in recent years, with increased consumption of FVIII and FIX from 0.33 IU per inhabitant in 2007 to 0.96 IU per inhabitant in 2009, in comparison to other

countries, factor usage in Algeria remains low. For example, a recent European survey reported median FVIII usage at 3.6 IU per capita [8], and for the G7 countries (Canada, France, Germany, Italy, Japan, United Kingdom and United States) mean FVIII usage has been reported at 3.9 IU per capita [9]. Such low on-demand therapy in Algeria may have contributed to a high national caseload of patients with joint damage requiring surgery.

Currently in Algeria, surgery (as a method of slowing disease progression and improving joint health), may reduce the need for more major and costly surgery in later life. However, as 14% of all surgical procedures recommended or indicated in this study involved a prosthetic replacement in patients from as young as 11 years of age (due to advanced orthopaedic complications), there is a clear need for better and more comprehensive use of prophylaxis in Algeria. This would help to reduce the levels of joint disease requiring major surgery in the haemophilia population, improve the orthopaedic outlook for patients and assist improved social integration. Furthermore, there is also a need for more physiotherapy and training, especially in children, as this can considerably reduce the need for orthopaedic surgery [10].

## CONCLUSION

In Algeria, insufficient use of on-demand FVIII and FIX has led to a situation where many patients with haemophilia have experienced haemarthrosis leading to joint damage requiring surgery. This study helps quantify the size of the problem and aids identification of subgroups of patients and their surgical needs; data can be used to help plan a strategy for ensuring that available resources are targeted at those patients most at risk of long-term disability, and those most likely to benefit from earlier surgical intervention to improve prognosis.

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## DISCLOSURE AND COMPETING INTEREST STATEMENT

The authors have no financial interests in any company or institution that might benefit from this publication.

## ABBREVIATIONS

F – Factor

QoL – Quality of life

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