Differences of subjective and semi-objective pain assessments in patients with haemophilia

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Introduction

Pain is a major problem in patients with haemophilia (PwH), affecting quality of life, psychological well-being and physical performance [1]. In the field of haemophilia, pain is often subjectively assessed on the basis of numeric (NRS) or visual analog scales, which are influenced by many factors [2,3]. Aim of this study was to analyze, if subjective pain assessments were suitable for the detection of pathological pain conditions in PwH.

Methods

Thirty-six patients with moderate to severe haemophilia A or B (mean age 47.1 ± 12.0 years) and 36 age-matched controls (mean age 47.3 ± 12.8 years) were included. All participants underwent a standardized examination consisting of semi-objective assessment of pressure pain thresholds (PPT), as an indicator for the individual pain sensitivity, at 11 landmarks across both knee joints (e.g. medial joint space, infrapatellar distal, Fig. 1). Additionally, the subjective pain condition (at the moment, 6 weeks and 3 months on average) at these 11 points were recorded via NRS (0="no pain" – 10="worst possible pain"). For each assessed landmark, the 95%-confidence interval (95%-CI) of control-knees were used to determine pathological PPT values in PwH, indicating clinical relevant alterations of the pain condition [4]. 72% of the PPT-data of PwH were beyond the 95%-CI of the control group and were further used for correlation analyses of PPT and NRS for each of the 11 landmarks.
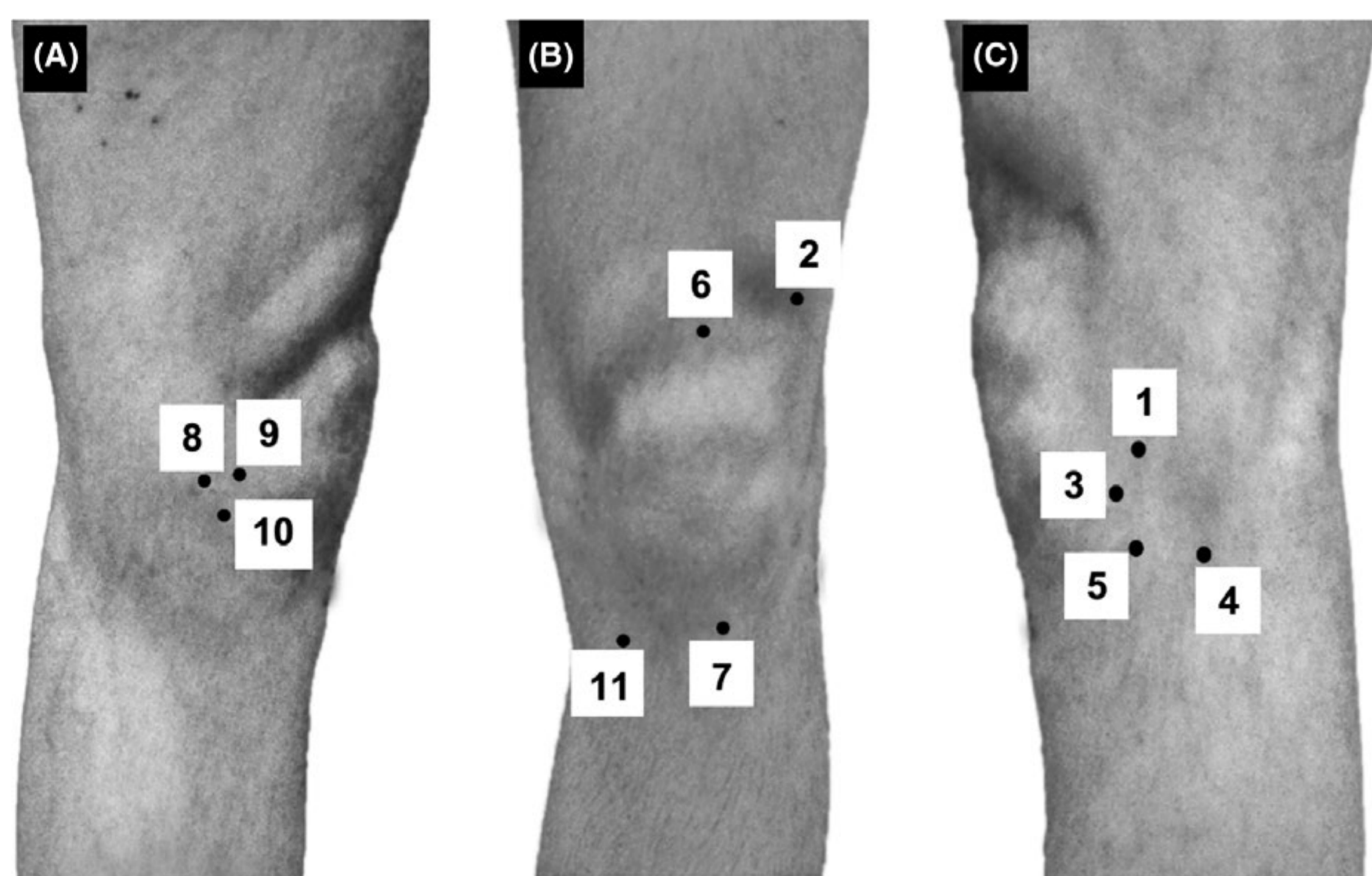

Figure 1: Anatomical landmarks at the (A=medial, B=front, C=lateral) knee for sonography and pressure pain threshold assessment. 1=lateral condyle of femur, 2=distal edge of m. vastus lateralis, 3=lateral knee joint space, 4=fibular head, 5=gerdy's tubercle, 6=suprapatellar region, 7=Infrapatellar area, 8=medial femur condyle, 9=medial knee joint space, 10=medial tibial plateau, 11=tibial metaphysis.

Results

Pathophysiological PPT and NRS values for the medial joint space (e.g. pain at the moment: r=-0.398, p=0.003) (Fig. 2) and the medial femur condyle (e.g. pain at the moment: r=-0.461, p=0.001) showed moderate correlations. Weak correlations of semi-objective and subjective pain values were determined for 5 landmarks. Four landmarks showed no statistical connections between pathophysiological PPT and NRS values (p>0.05) (Tab. 1).

Table 1: Pathological pressure pain thresholds (PPT) in Newton and subjective pain ratings (NRS=numeric rating scale (0-10)) at the knee joints of patients with haemophilia.

Landmark	PPT	NRS at the moment	NRS 6 weeks average	NRS 3 months average
Lateral condyle of femur (n=51)	40.8 ± 14.7	0.5 ± 1.2	0.2 ± 07	0.2 ± 0.7
Distal edge of m. vastus lateralis (n=58)	42.7 ± 13.9	0.2 ± 0.8	0.2 ± 0.9	0.2 ± 0.9
Lateral knee joint space (n=56)	45.2 ± 17.5	0.5 ± 1.1	0.4 ± 1.1	0.5 ± 1.2
Fibular head (n=48)	39.7 ± 16.0	0.3 ± 0.7*	0.1 ± 0.6	0.1 ± 0.6
Gerdy's tubercle (n=55)	43.5 ± 15.8	0.4 ± 1.0*	0.3 ± 1.0	0.3 ± 1.0
Suprapatellar region (n=60)	53.2 ± 18.9	0.4 ± 1.0*	0.3 ± 1.0	0.3 ± 1.0
Infrapatellar area (n=54)	56.2 ± 25.7	0.2 ± 0.5*	0.3 ± 1.0	0.5 ± 1.4
Medial femur condyle (n=53)	42.2 ± 15.2	0.6 ± 1.3**	0.8 ± 1.5**	0.9 ± 1.8**
Medial knee joint space (n=55)	44.0 ± 17.4	0.6 ± 1.0**	0.6 ± 1.4*	0.8 ± 1.8*
Medial tibial plateau (n=50)	37.1 ± 13.8	0.9 ± 1.5	0.9 ± 1.6	1.1 ± 1.9
Tibial metaphysis (n=57)	33.6 ± 12.5	0.7 ± 1.1*	0.2 ± 0.7	0.3 ± 1.3

*Data are presented as mean value ± standard deviation. n=number of knees. Correlation between PPT and NRS were calculated by Spearman´s roh. **p≤ 0.01, *p≤0.05.*
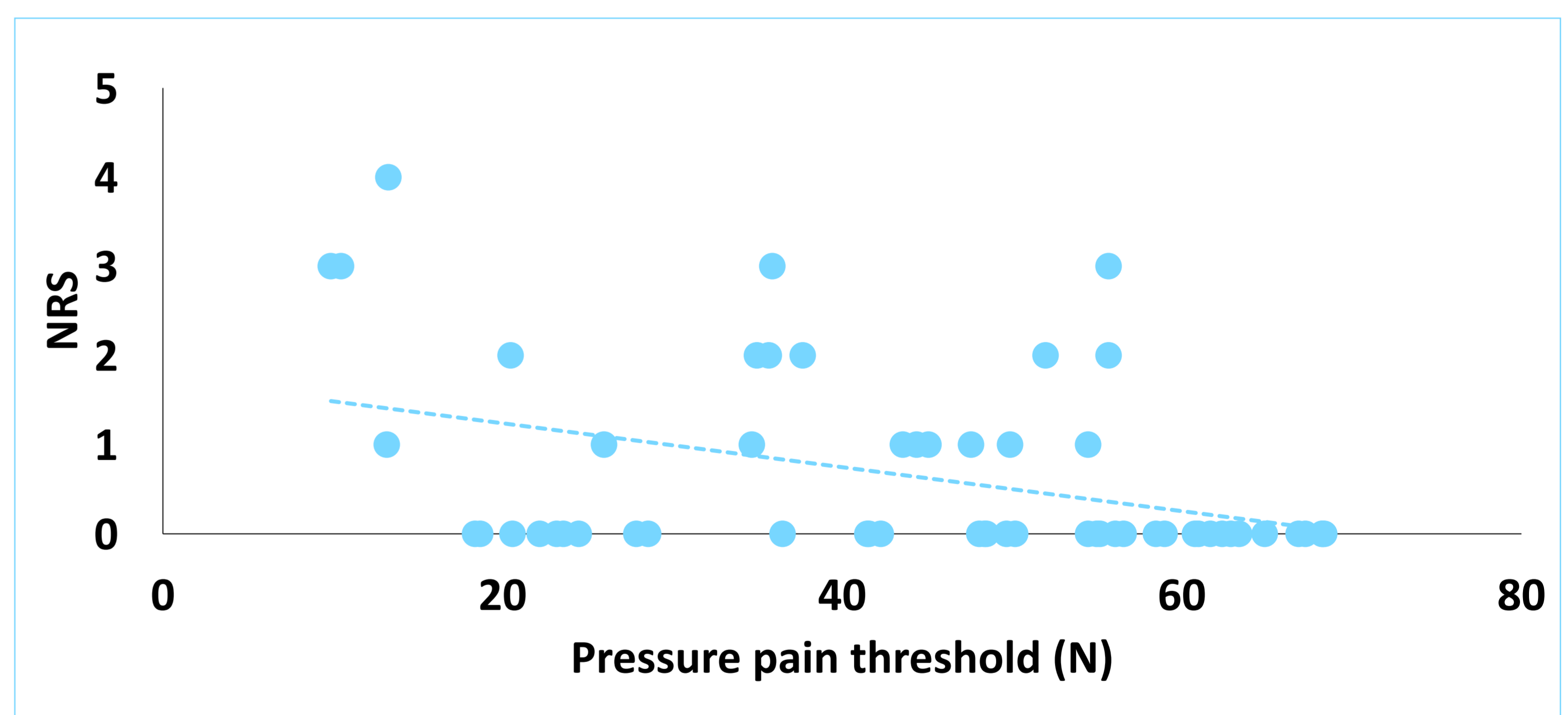

Figure 2: Pressure pain thresholds in Newton (N) and subjective pain ratings (NRS=numeric rating scale (0-10)) at the moment at the medial knee joint space in patients with haemophilia. r=-0.398, p=0.003.

Conclusion

This study revealed that pathological pain conditions, assessed by PPT, were not detected when PwH were asked to rate their pain intensity, based on the NRS, at the moment, in the last 6 weeks or last 3 months, because chronic pain might lead to a diffuse condition. Therefore, a sufficient, differentiated pain diagnostic based on subjective pain ratings is difficult to achieve. The results should be considered in the pain management in PwH in order to treat pain related alterations as early as possible.

References

[1]   Hilberg, T., Czepa, D., Freialdenhoven, D., & Boettger, M. K. (2011). Joint pain in people with hemophilia depends on joint status. Pain, 152(9), 2029-2035. doi:10.1016/j.pain.2011.04.030
[2]   Humphries, T. J., & Kessler, C. M. (2013). The challenge of pain evaluation in haemophilia: can pain evaluation and quantification be improved by using pain instruments from other clinical situations? Haemophilia, 19(2), 181-187. doi:10.1111/hae.12023
[3]   Humphries, T. J., & Kessler, C. M. (2014). Managing chronic pain in adults with haemophilia: current status and call to action. Haemophilia, 21(1), 41-51. doi:10.1111/hae.12526
[4]   Rolke, R., Magerl, W., Campbell, K. A., Schalber, C., Caspari, S., Birklein, F., & Treede, R.-D. (2006). Quantitative sensory testing: a comprehensive protocol for clinical trials. European Journal Of Pain, 10(1), 77–88. doi:10.1016/j.ejpain.2005.02.003

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