

Generalized joint hypermobility: a timely population study and proposal for Beighton cut-offs

Beighton cut-offs for generalized joint hypermobility

This editorial refers to Beighton scores and cut-offs across the lifespan: cross-sectional study of an Australian population, Harjodh Singh *et al.*

Interest in joint hypermobility within the performing arts, sports and medical communities has increased over the past 10 years, and this is reflected by the exponential growth in the number of publications in peer-reviewed journals over the past decade. Controversy exists over cut-off limits for generalized joint hypermobility (GJH) and whether or not GJH is a risk factor for injury. However, there is a growing evidence base for an association between GJH and musculoskeletal pain, fatigue and disability [1]. Furthermore, readers will be aware that joint laxity is also a feature of several of the hereditary disorders of connective tissue, such as Ehlers-Danlos Syndromes, Marfan Syndrome and Osteogenesis Imperfecta. The Beighton scale forms part of the diagnostic criteria for some of these syndromes. Therefore, an accurate method for identifying joint hypermobility across the lifespan, in different ethnic groups and in both males and females, is required in order to make an accurate diagnosis. The population study published in this issue of *Rheumatology* entitled 'Beighton scores and cut-offs across the lifespan: cross-sectional study of an Australian population' [2] is timely, and provides readers with a well-reasoned argument for proposed gender-specific cut-offs across the lifespan.

First developed in 1973 as an adaption of the Carter Wilkinson scale, the 9-point Beighton scale was designed as an epidemiological tool for identifying generalized hypermobility in Africa [3]. It was initially intended for adults and was not intended to be used for assessing children or in a clinical context. Other more comprehensive hypermobility scoring systems have been devised, such as the Rotès-Quérol scale [4], Bulbena scale [5], Contompasis score [6] and the Lower Limb Assessment Scale [7]. However, the Beighton scale, which is time-efficient and easy to administer, is the most commonly used. Limitations of the Beighton scale include the binary all-or-nothing scoring system, upper limb focus and single plane joint motion assessment. However, despite these limitations, the Beighton scale demonstrates good content validity in paediatric populations and high inter-examiner reproducibility at all ages [8–10]. The original Beighton scale used an arbitrary cut-off of four or more joints to determine GJH. Cut-offs of five, six, seven and even

eight have been used in younger populations as a way of accounting for flexibility in youth.

The authors of the current study critically justify the case for using Beighton score cut-offs closest to the uppermost 5%, which correlates to 2 s.d. above the mean. This thinking is in line with the 1965 recommendation of the American Academy of Orthopaedic Surgeons seeking to prevent overdiagnosis of joint hypermobility and to allow for the greatest accuracy in determining variations from the normal range of movement across age-groups and genders. Using this new criterion, a portrait of GJH in a typical Australian population is presented.

The paper concludes with an interesting recommendation by the authors of using a second assessment of joint mobility, such as the Lower limb Assessment Scale, which examines multidimensional joint and tissue movement in order to improve the validity of a diagnosis. This would be aimed at children, as that measure has not yet been validated in adults. In conclusion, this is an important article that provides researchers and clinicians with a new approach to assessing and determining GJH across the lifespan.

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Jane Simmonds¹

¹Great Ormond Street Institute of Child Health, University College London, London, UK

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Correspondence to: Jane Simmonds, Great Ormond Street Institute of Child Health, University College London, 30 Guilford St, London WC1N 1EH, UK.

E-mail: jane.simmonds@ucl.ac.uk

References

- 1 Scheper M, Juul Kristensen B, Rombaut L, Engelbert RRH. Disability in adolescents and adults diagnosed with hypermobility-related disorders: a meta-analysis. *Arch Phys Med Rehabil* 2016;97:2174–87.
- 2 Singh H, McKay M, Baldwin J *et al.* Beighton scores and cut-offs across the lifespan: cross-sectional study of an Australian population. *Rheumatology* 2017; doi: 10.1093/rheumatology/kex043.
- 3 Beighton P, Solomon L, Soskolne CL. Articular mobility in an African population. *Ann Rheum Dis* 1973;32:413–8.
- 4 Rotès-Quérol J. La laxité articulaire considérée comme facteur des altérations de l'appareil locomoteur. *Revue du Rhumatisme et des Maladies Osteo-Articulaires* 1957;24:535–9.
- 5 Bulbena A, Duro JC, Porta M *et al.* Clinical assessment of hypermobility of joints: assembling criteria. *J Rheumatol* 1992;19:115–22.
- 6 McNeerney JE, Johnston WB. Generalized ligamentous laxity, hallux abducto valgus and the first metatarsocuneiform joint. *J Am Podiatry Assoc* 1979;69:69–82.
- 7 Ferrari J, Parslow C, Lim E, Hayward A. Joint hypermobility: the use of a new assessment tool to measure lower limb hypermobility. *Clin Exp Rheumatol* 2005;23:413–20.
- 8 Juul-Kristensen B, Rogind H, Jensen D *et al.* Inter-examiner reproducibility of tests and criteria for generalized joint hypermobility and benign joint hypermobility syndrome. *Rheumatology* 2007;46:1835–41.
- 9 Junge T, Jespersen E, Wedderkopp N *et al.* Inter-tester reproducibility and inter-method agreement of two variations of the Beighton test for determining Generalised Joint Hypermobility in primary school children. *BMC Pediatr* 2013;13:214.
- 10 Smits-Engelsman B, Klerks M, Kirby A. Beighton Score: a valid measure for generalized hypermobility in children. *J Pediatr* 2011;158:119–23.