

THE ASSOCIATION BETWEEN JOINT HYPERMOBILITY AND PELVIC ORGAN PROLAPSE IN WOMEN: A SYSTEMATIC REVIEW AND META-ANALYSIS

Hypothesis / aims of study

Pelvic organ prolapse (POP) is common among parous women, with prevalence estimates as high as 37%. It is associated with impaired quality of life, with a substantial impact on bladder, bowel, and sexual function. Altered collagen metabolism, contributing to pelvic floor laxity and inadequate support of the pelvic organs has been implicated in the aetiology of prolapse. Ligamentous laxity of the joints may also occur as a consequence of collagen disorders, and suggests potential for a shared pathogenesis for POP and joint hypermobility (JHM). Such an association would provide important prognostic information, as JHM typically presents years or decades before the onset of POP. We conducted a systematic review and meta-analysis, assessing the strength, consistency, and potential for bias among pooled associations from all available observational studies of JHM and POP.

Study design, materials and methods

Following a prospectively registered review protocol, we searched Medline, EMBASE, and CINAHL through to March 1st 2015 without language restrictions. In addition, we searched ICS and IUGA annual meeting abstracts 2005-2015, and reference lists for all included studies. We pre-specified inclusion of both case-control and cohort studies. We applied strict criteria to carefully choose eligible studies and employed standardized, piloted data forms for data collection. Two methodologically trained reviewers independently screened titles and abstracts, and then full text papers to confirm eligibility. We extracted data on study and patient characteristics, assessments for both JHM and POP, and statistical analyses used. We assessed design features that could potentially bias the effect estimates, including comparability and representativeness of source populations (sampling frame), confidence in the assessment of JHM and POP, adjustment for confounding and missing data. Random effect meta-analyses were conducted using the metan command, and metaregression was conducted using the metareg command for Stata 12.0.

Results

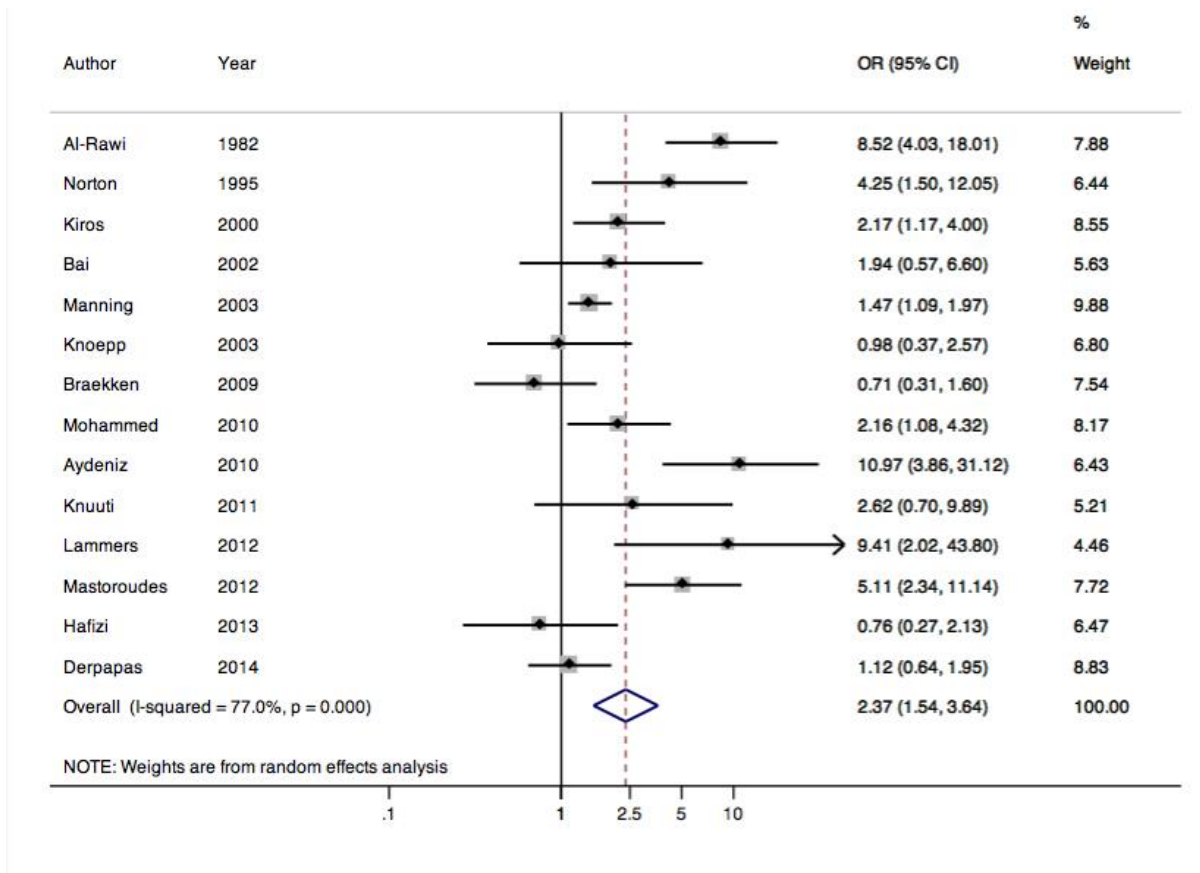
We screened 269 abstracts, and retrieved 39 full texts. 17 studies enrolling 8499 participants provided data, of which 14 could be included in meta-analysis. POP assessments included POP-Q (n=9), non-validated scoring system (n=3), or Baden-Walker grades (n=2). JHM assessments included the Beighton score (n=8), the Carter-Wilkinson score (n=2), the Hakim questionnaire (n=1), the recent Brighton criteria (n=1) and non-validated assessment tools for JHM (N=2). The overall pooled OR was 2.37 (95%CI 1.54-3.64, I²=77.0%). We explored this high heterogeneity using metaregression, testing the effects of study setting and risk of bias ratings as predictors of effect size. We did not identify significant factors in meta-regression, suggesting that the heterogeneity may relate instead to differences in case definitions, differences in populations, or unknown sources of bias. There was no evidence of publication bias either with visual inspection of the funnel plot, or with formal regression (Harbord test p=0.68). 6 studies were at high risk of bias for at least one criterion, with frequent differences in sampling frames for cases and controls, limited validity for assessments of JHM and POP, and failure to explore or match for important prognostic variables.

Interpretation of results

We found a strong pooled association between POP and JHM, with an effect size that is clinically highly relevant. Our findings are limited by a high heterogeneity between studies that was not entirely explained by methodological differences. The primary studies have potential for residual confounding and are at high risk of both Berkson bias and spectrum bias, which may have inflated the pooled association, compared to the general population.

Concluding message

Evidence from available cross-sectional studies demonstrates that JHM is an important marker for POP. JHM scoring could be used together with other known risk factors to stratify or target women for primary prevention. Future work should explore the shared aetiological processes that explain this association. Longitudinal studies are needed to demonstrate the prognostic significance of JHM on development and progression of prolapse, and to understand whether it impacts on treatment outcome.



References

1. Incontinence, 5th edn. Paris, France: Health Publications Ltd, 2013: 63–70
2. Arch Dis Child 1999; 80: 188–91
3. Arthritis Rheum 2004; 50: 2640–4

Disclosures

Funding: none **Clinical Trial:** No **Subjects:** HUMAN **Ethics not Req'd:** It was a systematic review. **Helsinki:** Yes **Informed Consent:** No