Patients with ultrasound-detected shoulder pathologies cluster into groups with different clinical associations

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Background

Shoulder pain is common and its management remains challenging, often resulting in poor outcomes: 50% of people continue to have shoulder pain at 18 months. This may be in part due to inaccurate clinical diagnosis. Ultrasound offers accurate detection of pathology and its use is increasing. However, the relationship between ultrasound findings and clinical phenotype is unclear.

Objectives

To explore if latent class groupings of shoulder ultrasound scans existed and explore the association between the different groups and patient reported outcome measures.

Methods

Firstly, a retrospective study of 3000 ultrasound scans reports of people with shoulder pain referred from primary care was undertaken. Latent class analysis (LCA) identified if individual pathologies clustered in groups. Optimal group number was determined by the minimum Bayesian information criterion. A questionnaire was sent to all patients scanned over a 12-month period (n=2322). Data collected included demographics and current symptoms. The relationship between pathology-defined groups and clinical outcomes was examined. Next, a prospective study recruiting 500 primary care patients referred for shoulder ultrasound was undertaken, following the introduction of standardised reporting. Baseline data was collected via self-reported questionnaires. Outcome measures collected included pain, function, quality of life, activity and levels of acceptable symptom states. These measures underwent Rasch analysis. LCA was undertaken to confirm groups.

Results

In the retrospective review of ultrasound pathologies, LCA revealed four groups: 1. bursitis with limited inflammation (n=1280); 2. bursitis with extensive inflammation (n=595); 3. rotator cuff tears (n=558); 4. limited pathology (n=567). 777 (33%) completed questionnaires; median (IQR) duration post-ultrasound scan was 25 (22, 29) months. Shoulder Pain and Disability Index scores were highest in group 3 (42, 95% CI 34, 51) and lowest in group 4 (20, 95% CI 11, 29). The prospective study confirmed the existence of the same 4 groups. Group 3 had the highest levels of baseline symptoms (56.6, 95% CI 54.4, 58.9), and the lowest levels of acceptable symptom state (11%). Group 4 had the highest levels of baseline acceptable symptom states (35%). The extensive inflammation group had the lowest baseline activity scores (10.0, CI 9.2, 10.9).

Conclusions

Ultrasound pathologies cluster into groups. These groups differ in symptom associations at baseline; expanding the LCA to include covariates will allow us to formally explore these associations. A longitudinal study will provide understanding of the relevance of these groups to long-term patient outcomes.