

# COMPARISON OF PATELLA ALIGNMENT AND CARTILAGE BIOMARKERS IN YOUNG ADULT FEMALES WITH AND WITHOUT PATELLOFEMORAL PAIN: A PILOT STUDY

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## ABSTRACT

**Background:** Evidence suggests that individuals with patellofemoral pain (PFP) may develop patellofemoral joint osteoarthritis (PFJOA). Limited data exist regarding an absolute association between PFP and PFJOA. Understanding this relationship will support the need for early interventions to manage PFP.

**Hypothesis/Purpose:** This study was conducted to determine if females with PFP have a patella position and cartilage biomarkers similar to individuals with PFJOA. It was hypothesized that females with PFP and excessive patella lateralization would have higher cartilage biomarker levels than controls. It also was hypothesized that a significant association would exist between pain and cartilage biomarker levels in subjects with excessive patella lateralization.

**Study Design:** Single-occasion, cross-sectional, observational

**Methods:** Pain was assessed using a 10-cm visual analog scale (VAS) for activity pain over the previous week. Patella offset position (RAB angle) was measured using diagnostic ultrasound. Urine was collected and cartilage biomarkers quantified by analyzing C-telopeptide fragments of type II collagen (uCTX-II). Independent *t*-tests were used to determine between-group differences for RAB angle and uCTX-II. Bivariate correlations were used to determine associations between VAS and uCTX-II for females with PFP.

**Results:** Subjects (age range 20 to 30 years) had similar RAB angles ( $p = 0.21$ ) and uCTX-II ( $p = 0.91$ ). A significant association only existed between VAS scores and uCTX-II for females with PFP who had a RAB angle  $> 13^\circ$  ( $r = 0.86$ ;  $p = 0.003$ ). Comparison of uCTX-II in the 25-to-30-year-old females with PFP and excessive patella lateralization in the current study to published normative data showed that this cohort had elevated biomarkers.

**Conclusion:** These findings support that a certain cohort of individuals with PFP have features similar to individuals with confirmed PFJOA (patella lateralization and elevated biomarkers). Additional studies are needed to determine if interventions can reverse not only pain but biomarker levels.

**Keywords:** Knee; patella; ultrasound imaging

**Level of Evidence:** 2b (diagnosis)

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