Exploratory study to identify mechanical factors that may contribute to toe dactylitis in patients with psoriatic arthritis

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Background
Dactylitis (sausage digit) is one of the most commonly reported features of psoriatic arthritis (PsA) (Fig 1).
It has been hypothesised that dactylitis is a functional enthesitis at the proximal interphalangeal joints (hands and feet), resulting in synovitis, tenosynovitis, bone and soft tissue oedema to the digit.
Trauma and physical insult to the digit have been suggested as a possible cause

Aim
• To explore mechanical factors that may contribute to the occurrence of dactylitis in patients with PsA.
• To explore the impact of dactylitis on impairment, function, activity and limitations.
• To provide insight into plantar pressure distributions in PsA

Methods
12 participants with PsA and a history of dactylitis (group i), 12 participants with PsA and no history of dactylitis (group ii), 12 control participants (group iii) were recruited.
Plantar pressure measurements were undertaken barefoot and in footwear.
Peak plantar pressure and pressure time integral were analysed at the most common and second most common sites of dactylitis reported in the foot; 2nd and 4th toes, and 2nd and 4th metatarsophalangeal joints (MTP) of the left foot (fig 2).
Temporal and spatial parameters of gait were collected
Patient reported impairment and footwear (FISAP), and activity limitation and participant restriction (FISIF) were reported using the Foot Impact Scale for Rheumatoid Arthritis (FIS-RA).

Results
PsA patients in both groups had a mean disease duration of 4.5 years
• Mean FIS-RAF out of 21 - PsA Dactylitis 7.16 - PsA no history of dactylitis 6.83 - Controls 0.41
• Mean FIS-RAA Out of 30 - PsA Dactylitis 8.75 - PsA no history of dactylitis 5.75 - Controls 0.16
ANOVA analysis and subsequent post-hoc testing using Games-Howell test yielded significance in FIS-RA mean scores.
No Significant difference in plantar pressures or gait variables between groups

Conclusions
• This is the first exploratory study to investigate the mechanical factors that may cause dactylitis in PsA
• FIS-RA scores indicate PsA patients have significant limitations compared to controls, but a history of dactylitis does not worsen patient reported outcomes.
• Although no significant differences could be reported in plantar pressure data or gait variables, the study was underpowered.
• Exploration of shear and friction in the forefoot may provide insight for a biomechanical trigger to dactylitis.

References