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Pain, not structural impairments may explain activity limitations in people with gluteal tendinopathy or hip osteoarthritis: A cross sectional study☆

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ABSTRACT

Question: What are the functional differences between people with greater trochanteric pain syndrome (GT), hip osteoarthritis (OA) or an asymptomatic population as measured by walking, Time Up and Go, single leg standing and strength?
Design: Cross sectional study with blinded measurers.
Participants: 38 participants with GT, 20 with end stage hip OA and 21 asymptomatic healthy control (AS) participants. All participants were women.
Outcome measures: Pain (numeric rating scale), Walking speed (m/s), cadence (steps/min) and step length (m) measured via the 10 m walk test and the Timed Up and Go; balance via single leg stance (s) duration; and hip abduction, adduction, medial and lateral rotation strength, standardized to body mass (BM) via the body mass average index (BMavg), measured via a wall mounted dynamometer.
Results: The two symptomatic groups reported similar pain levels ($p = 0.226$), more pain then the AS group ($p < 0.000$). Compared to the AS participants, participants with GT or hip OA demonstrated lower walking speed (10mwt and TUG, $p < 0.001$), lower cadence and shorter duration single leg stance on the affected leg ($p < 0.05$). Participants with GT or hip OA also demonstrated bilaterally weaker hip abduction than the AS group ($p \leq 0.005$). Compared to AS and GT participants, participants with hip OA demonstrated adduction weakness on the affected side ($p = 0.008$ and $p = 0.002$ respectively).
Conclusion: There is a significant level of dysfunction and impairments associated with GT and hip OA. As activity limitations do not appear to be differentiated by structural impairments, we suggest that pain, rather than the underlying pathology may be the driving impairment that leads to walking and single leg standing dysfunction.

1. Introduction

Greater trochanteric pain syndrome (GT) is a common condition affecting up to 23.5% of women over the age of 50 [1]. Gluteal tendinopathy is now thought to be the primary cause of GT [2,3]. Hip osteoarthritis (OA) prevalence increases with age, with an estimated 10% to 15% of women aged 65 to 70 years affected by it [4]. People with GT and hip osteoarthritis (OA) have similar pain distribution patterns [5–7], pain severity levels [8,9], and low quality of life measures [10].

Walking, standing and difficulties with activities of daily living are reported by people with GT [10,11], and people with OA [12] This is relevant because gait dysfunction is associated with

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increased fatigue, energy expenditure [13–16], and reduction in activity [17] – known to be associated with increased risk of adverse chronic health conditions. Biomechanical analysis of people with hip OA has found a shorter step length and reduced joint excursion [18]. Functionally, people with hip OA have been found to have lower walking speeds and other functional measures than a pain free population [19]. There is a dearth of articles reporting activity limitations associated with GT. The single gait biomechanical study found people with symptomatic GT had increased pelvic and trunk lateral movement compared to a pain free group [20]. It is not clear if this finding has any clinical or functional significance. To our knowledge, there are no studies reporting activity limitations in people with GT.

The ability to negotiate ones' environment safely is imperative to remaining independent. Falls among older people are a common cause of injury [21] and cost the community significant amounts of money per annum [22]. The ability to balance on one leg is required in order to safely undertake activities of daily living such as dressing and ascending stairs. The single leg stance test has been used to evaluate this impairment in healthy controls, and people with various conditions ranging from burns to ankle sprains requires the ability to balance on one leg[23–26]. To our knowledge functional balance has not been evaluated in people with GT or hip OA.

People with gluteal tendinopathy have weaker hip abduction than aged matched healthy adults [27]. However, people with hip OA have also been found to have reduced abduction strength and muscle size [29] when compared to an asymptomatic group. Reduced leg strength is associated with reduced activity [17] and thus increased of risk chronic disease. Strength in people with GT or OA has not been tested against symptomatic comparison groups, limiting the clinical value to the reported outcomes. These findings combined suggest that pathology and or pain about the hip is associated with gluteal muscle weakness.

The research questions were:

1. What are the differences in measures of walking and balance between people with GT, hip OA and an asymptomatic comparison group?
2. What are the differences in hip strength between people with GT, hip OA and an asymptomatic comparison group?

2. Method

2.1. Design

This study was part of a larger cross sectional study of people with GT, hip OA, and an asymptomatic group [10,30].

2.2. Participants

Participants were recruited from the community, both private and public hospital waiting lists, and via word of mouth. Participants with GT (n = 38) had clinical signs and symptoms that ranged from mild (n = 10) (not seeking treatment) through to severe (n = 11) (scheduled for tendon reconstruction surgery). None were currently attending a pain clinic although one had previously done so. The end stage hip osteoarthritis group, (n = 20) were all scheduled for hip arthroplasty surgery (60% public

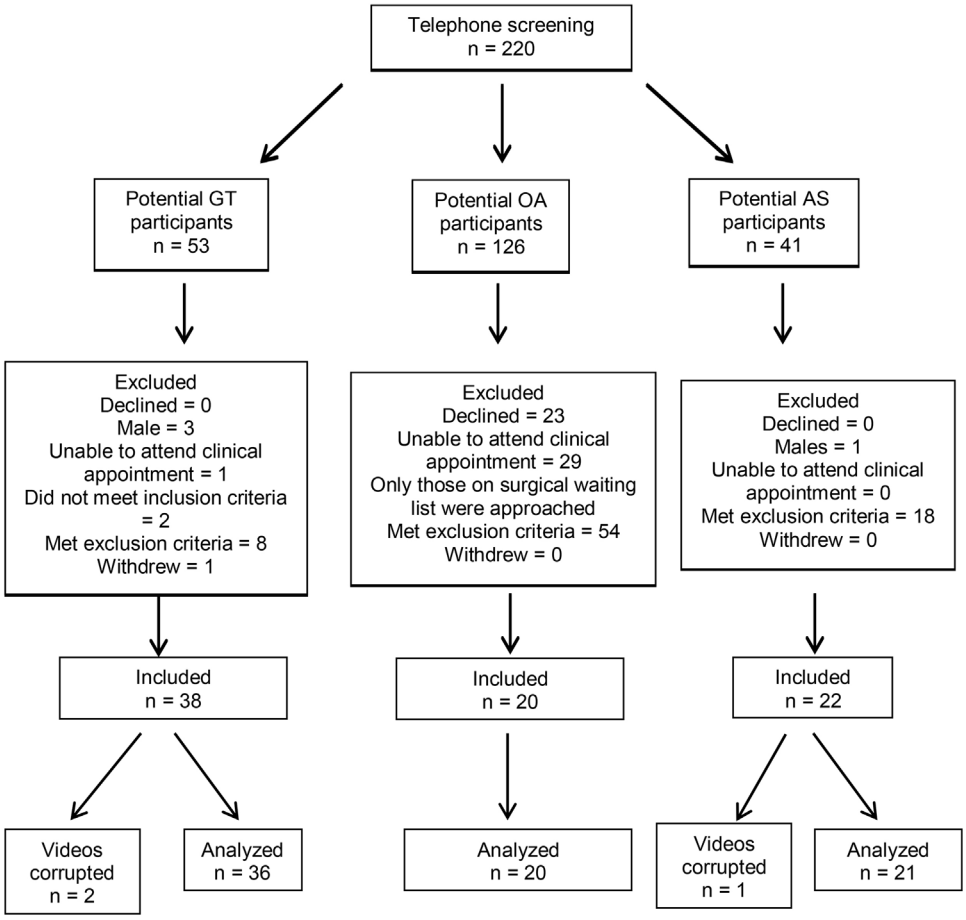

Fig. 1. Participant recruitment flow chart.