Introduction

People with restricted mobility, who use a hoist to transfer, are at high risk of gluteal pressure ulcers. Current guidelines recommend the removal of hoist slings between transfers to reduce this risk [1,2] but evidence supporting this is lacking and anecdotal evidence supports that people are often left sitting on hoist slings for ease of the carer, time restraints or at the request of the client themselves. There is no objective evidence on the effects of sling materials on gluteal pressures to support or refute these recommendations.

Study Aims:

To investigate and compare the effect of three types of hoist sling materials on:

A Pressure exerted across the gluteal area (buttocks and thighs)
B Peak pressure "hotspots" at ischial tuberosities
C Wheelchair Users perception of comfort whilst sitting on these slings

Background to the study

There are over 200 devices to redistribute pressure while sitting on the market[3]. Most devices, such as pressure-relieving cushions, aim to distribute compressive forces evenly across their surface. In practice, cushions are often covered to protect the surface and maintain cleanliness. However, fitting a cover can produce a ‘hammock effect’ which increases compressive forces at the bony prominences, such as the ischial tuberosities [IT’s](4)(Figure 1). Materials with two-way stretch are typically used for the cushion covers to overcome this effect. (IT’s) (4)(Figure 1). Materials with two-way stretch are typically used for the cushion covers to overcome this effect. The use of a hoist sling may disrupt the pressure-relieving properties of cushions, and anecdotal evidence supports that people are often left sitting on these slings for ease of the carer, time restraints or at the request of the client themselves. There is no objective evidence on the effects of sling materials on gluteal pressures to support or refute these recommendations.

Method

Participants:

32 volunteers recruited from Salford and Stockport Wheelchair Services, varying levels of disability/diagnosis

17 men and 15 women ages 24 – 78

BMI range 18.9 – 49.6

Exclusion criteria - any existing pressure ulcer and a diagnosis of skin conditions affecting the back, or which could be at risk due to scarring or a recent surgical procedure. Participants must also be able to sit in an upright chair, independently control their body position, and must not be using any pressure-relieving products, be able to give informed consent, and be able to sit with an upright posture for the length of the study.

A height adjustable chair with X-sensor pressure mat in situ

Data were analysed using one way repeated measures analysis of variance (ANOVA) with Bonferroni adjustment for multiple testing to determine whether:

- There were any differences between the control condition and each of the three sling fabrics in terms of:
  - surface area,
  - average gluteal interface pressure
  - peak pressures at (i) the right and left ischial tuberosities, (ii) right and left greater trochanters and (iii) coccyx

- Any sling fabric increased area and reduced interface pressure more effectively than others

- Comfort ratings for fabrics were compared to each other using Friedman’s ANOVA. Cochran’s Q test was used to determine whether there were any differences in perceived occurrence of sweating between fabrics.

Results

Results identify statistically significant difference between Prism spacer fabric and Prism slipfit at 95% confidence level.

Compared to the results from the healthy population study (Mellson and Richardson, 2012), coccyx peak pressure was twice as high in this group identifying a significantly higher risk of PU development due to sacral sitting and lack of core stability.

Data analysis

Data were analysed using one way repeated measures analysis of variance (ANOVA) with Bonferroni adjustment for multiple testing to determine whether:

- There were any differences between the control condition and each of the three sling fabrics in terms of:
  - surface area,
  - average gluteal interface pressure
  - peak pressures at (i) the right and left ischial tuberosities, (ii) right and left greater trochanters and (iii) coccyx

- Any sling fabric increased area and reduced interface pressure more effectively than others

- Comfort ratings for fabrics were compared to each other using Friedman’s ANOVA. Cochran’s Q test was used to determine whether there were any differences in perceived occurrence of sweating between fabrics.

Overall preference was for the Prism spacer, followed by the Prism polyester and lastly the Prism slipfit.

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References