

Breast Kinematics and Exercise Induced Breast Pain in Simulated Horse Riding

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INTRODUCTION:

Breast related barriers affect many women during sport. So much so that it can affect participation rates of women in sport. Only 17% of women are seen to take part in a sporting activity within the UK, and with 88% of horse riders being women it is critical that the potential barriers are understood and minimised to keep female sport participation as high as possible. Limited research is available on the physical implications of horse riding, especially on the movement that the riders' body must absorb from the horse. Breasts have been ranked the 4th most common barrier to exercise (Burbage & Cameron, 2018), with 40% of female riders reporting experience of breast pain whilst horse riding (Burbage & Cameron, 2017). Yet, currently, there is only one bra available marketed as a horse riding specific bra, and the common recommendation is for women to use a running sports bra. As breast pain and breast movement are likely to cause women to have a negative self-image and lack in confidence during exercise, and breasts are delicate structures comprised of mainly fibrous and adipose tissue, both of which can be damaged when stretched beyond their elastic capacity by excess movement and strain, appropriate breast support for different exercise activities is warranted. As equestrianism is a popular activity for females, the most appropriate breast support for this activity should be investigated.

METHOD:

Nine female regular horse riders were recruited (bra band 32-38, cup size A-E). Each participant completed four riding trials on a Racewood™ Equine Event simulator for 60 seconds in sitting trot in a specialised riding bra (RD) (padded, underwired riding bra, made from 75% polyamide and 25% elastane, Berlei™), a specialised running bra (RB) (Ultimate run bra, made from 10% polyester, 81% polyamide and 9% elastane, Shock Absorber™), an everyday bra (EB) (plain, non-padded, underwired T-shirt bra, made from 78% polyamide and 22% elastane; Marks & Spencer™) and finally with no breast support. Miquis™ infrared cameras at 240-Hz were used to record breast movement using B&L 12mm reflective markers, quantified in Qualisys Track Manager™. After each trial, riders completed a 100mm visual analogue scale (VAS) to indicate exercise induced breast pain (EIBP).

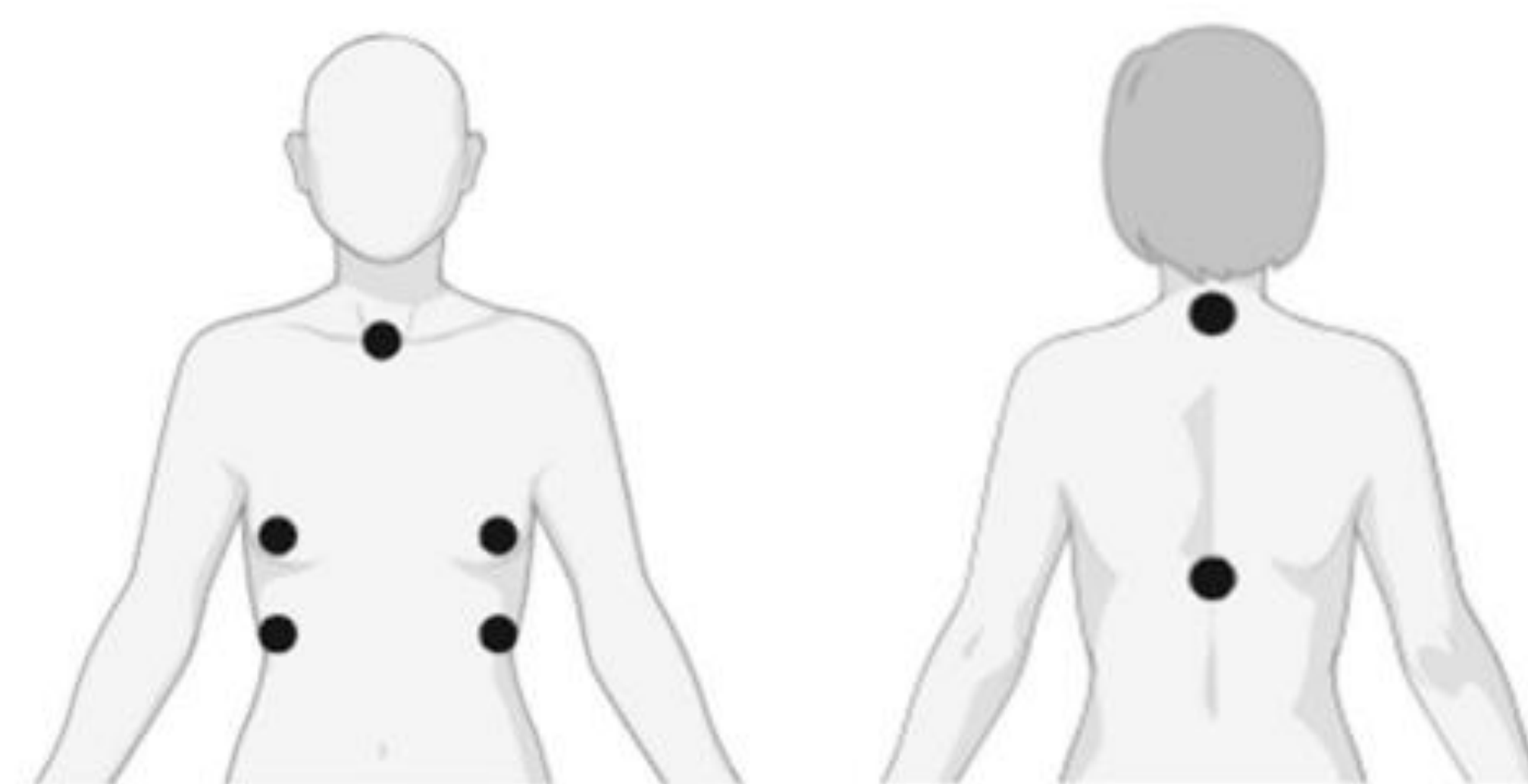
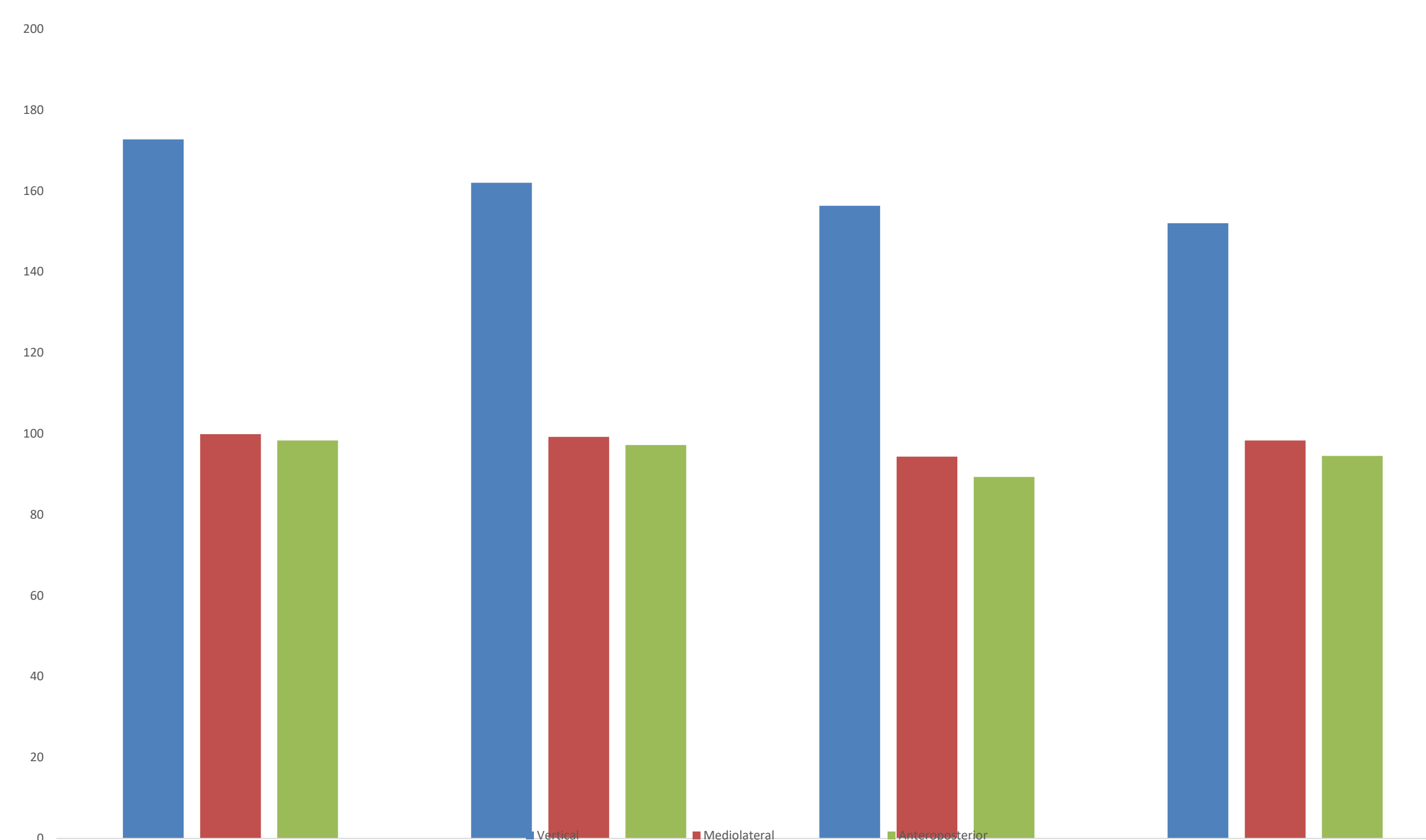


Figure 1. Placement of B&L reflective markers on the sternal notch, left and right nipple, the left and right anterior inferior aspect of the 10th ribs, and vertebrae (C7 and T7) (Scurr, White and Hedger, 2011)

RESULTS:

- Mean (SD) unsupported relative breast displacement was 172.7 ± 17.8 mm vertically, 99.3 ± 5.2 mm mediolaterally, and 98.3 ± 31.4 mm anteroposterior across all support conditions.
- The greatest vertical movement reduction was seen in the riding bra (RD), but the greatest mediolateral and anteroposterior reduction was seen in the running bra (RB) from the bare (B) condition (Fig. 2).
- A significant correlation was found between relative breast movement and pain scores within the B, EB and RB condition, but none seen in the RD condition.
- The riding bra (RD) induced the greatest reduction in pain score (67.6%) from the bare (B) condition when riding the equine simulator.



DISCUSSION & CONCLUSIONS:

The results of this study showed that each breast support condition influenced relative breast displacement as well as exercise induced breast pain, particularly the running bra (RB) and horse riding bra (RD). The movement recorded in this study was higher than reported in previous studies, but this could be due to the small number of participants but large breast size range. An increase in breast support was seen to decrease movement in all directions, particularly vertically. There was no significance difference in movement between the RB and the RD across any axis suggesting that the RD provides similar support as the RB. There was no significant difference in relative breast displacement between the bare (B) condition and the everyday bra (EB) suggesting that horse riding in an every day bra offers limited support benefits during this activity. Further exploration is warranted to establish the relationship between relative breast displacement and exercise induced breast pain in the horse riding specific bra as this differed to all other breast support conditions. This study demonstrated a need for further research to establish discipline specific breast movement, such as a comparison of running and horse riding activities utilising a larger sample of female riders to develop more effective breast support advice available to the large female equestrian population to encourage participation.

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