An investigation into the effects of compression therapy on latent upper Fibres Of Trapezius trigger points on peripheral sympathetic nervous system activity in the upper limb

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Aims

➢ To establish if Compression Therapy (CT) applied to latent trigger points causes a peripheral sympathetic nervous system (SNS) response

➢ To quantify the sympatho-excitation by measuring skin conductance in the hands

➢ To investigate if a manual therapy technique which specifically targets muscle tissue can elicit a SNS response

Figure 1: Biopac GSR100B Electro-dermal Activity Amplifier

Results

➢ Statistically significant differences were observed between control and intervention groups (p<0.005) and between placebo and intervention groups (p<0.005)

➢ The CT technique increased SNS activity by 92.9% from baseline levels

➢ This was significantly greater than the placebo technique (7.8%) and the control condition (3.2%).
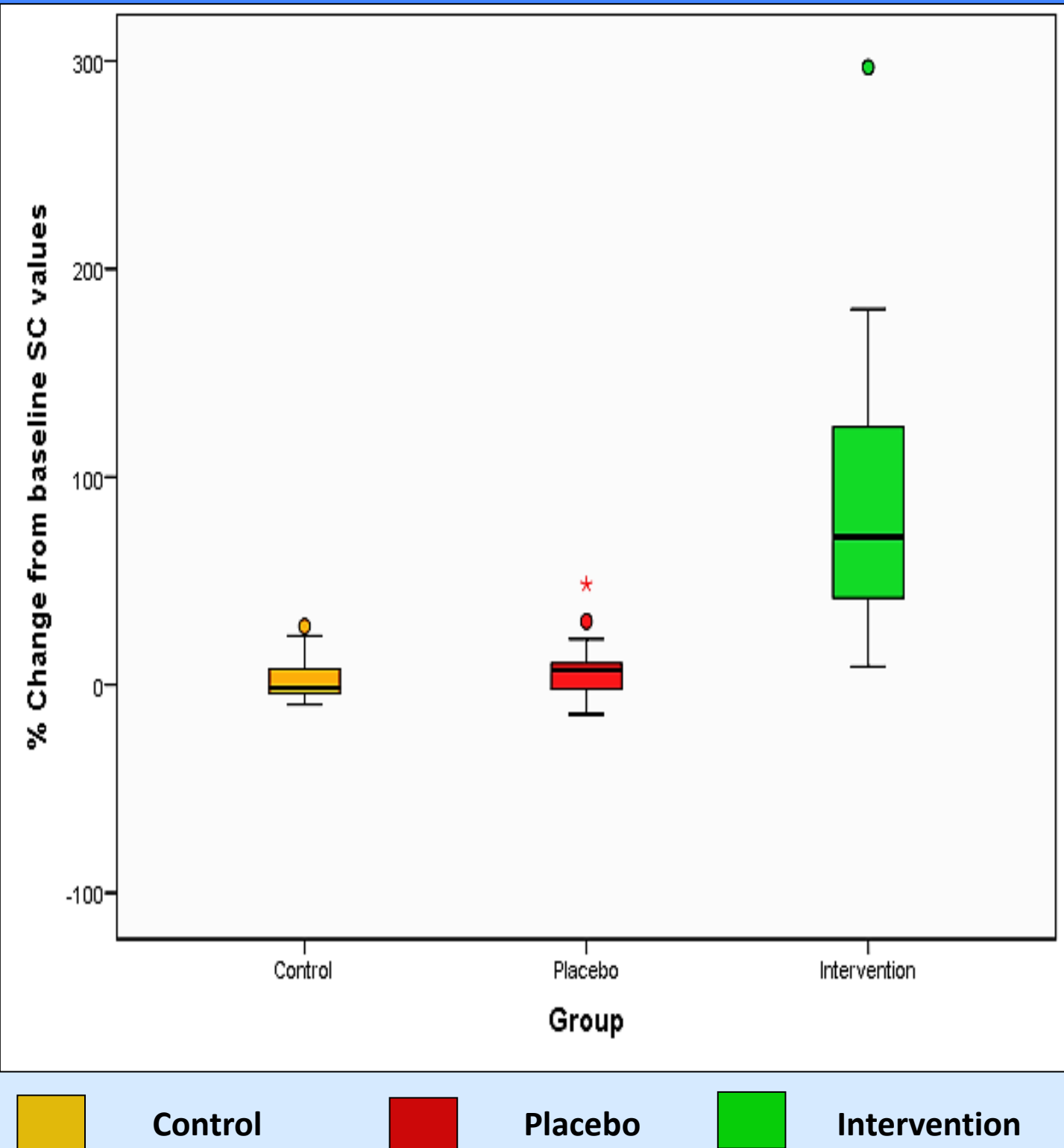
Methodology

➢ This investigation employed a double-blinded, mixed-gender, independent (matched) group design.

➢ A convenience sample of 45 participants with an identifiable latent TrP within their left upper fibres of trapezius (UFoT) muscle was taken from healthy volunteers within the undergraduate Physiotherapy cohort of Coventry University.

➢ Participants were male and female between the ages of 18-35 and randomly allocated into intervention, placebo or control group (n=15 per group).

➢ Biopac GSR100B Electro-dermal Activity Amplifier (MP35; Biopac Systems Inc.; Santa Barbara, CA) recorded skin conductance (SC) (as a proxy measure of SNS activity) in the index and middle finger of the left hand (Jowsey & Perry, 2011)

➢ SC recordings were taken for a 10 minute stabilisation period (baseline), an intervention period (3 minutes) and a final rest period (5 minutes) (Perry & Green 2008)

➢ Two 1 minute sections were utilised for data analysis; to produce a percentage change from baseline value to the intervention period (Perry & Green, 2008)

➢ The null hypothesis was tested using One-way ANOVA and post-hoc analysis was performed using Tukey's HSD. The level of significance set at $p<0.05$.

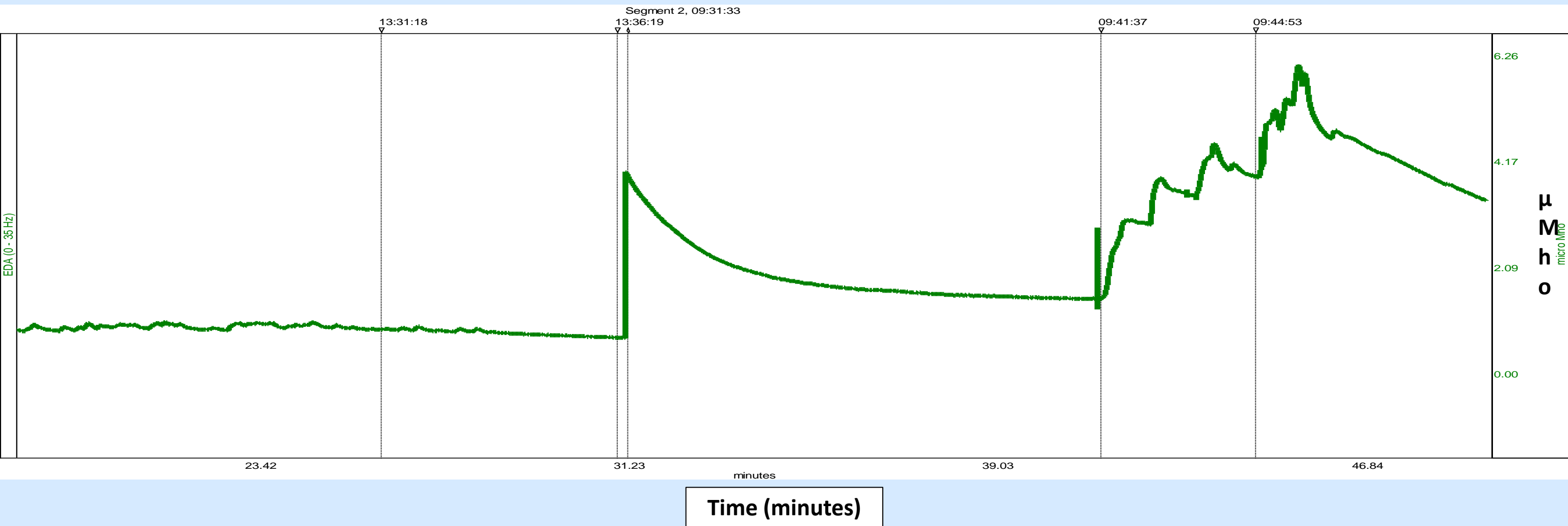**Figure 2: CT technique applied to latent trigger point**

Figure 3: Boxplot graph displaying percentage change from baseline for each of the experimental conditions

🟨 **Control** 🟥 **Placebo** 🟩 **Intervention**

Conclusions

➢ The significance and magnitude of these results provides preliminary evidence that CT applied to TrPs has an effect on peripheral SNS activity

➢ Results contribute to the body of evidence which suggests that manual therapy techniques achieve positive treatment outcomes by activation of SNS (Bialosky et al, 2009)

➢ CT is believed to stimulate A-δ nerve fibres which fire continuously in response to provocation and therefore do not adapt to ongoing stimulus (van Greivensen, 2005: 16)

➢ The increased nociceptive afferent stimulation initially caused by CT could result in a more substantial afferent bombardment of the dorsal lateral horn of the spinal cord and subsequently the dPAG region of the midbrain

➢ Magnitude of results achieved by this investigation are substantially greater than those achieved by SMT techniques (Perry & Green, 2008; Sterling et al, 2001) which stimulate mechanorecptors rather than nociceptors

➢ Future investigation could look into whether the degree of sympatho-excitation achieved is directly related to the amount and type of afferent stimulus the CT technique provides

References

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Figure 4: SC measurement of an intervention group participant displaying the baseline/intervention periods and magnitude of treatment effect

Time (minutes)