Background and Aim

Patients affected by neck problems who request physiotherapy may present with pain (Fernández-Perérez, 2012), stiffness (Ingram, 2015) or a combination of the two (Binder, 2007). An improvement in ROM is one of the desired outcomes of manual therapy mobilisations and manipulations (Bialosky, 2009). Manual spine mobilisation is one of the treatment modalities supported by guidelines (Childs, 2008), good clinical practice recommendations (NICE, 2009), and scientific evidence (Hurwitz, 1996), and is taught in manual therapy courses (Grieve, 1988; Kaltenborn, 2003; Cook, 2011; Hengeveld, 2013; Atkins, 2016) as a treatment for pain and reduced ROM. Objectives: The aims of this study were to measure changes in Range of Motion (ROM) using two mobilisation techniques (manual traction and antero-posterior (AP) glide) and to compare the magnitude of changes in cervical ROM with two techniques.

Design: Pre- and post-interventional study with crossover design. Setting: The Rehabilitation Research Laboratory (SUPSI-2rLab) at the University of Applied Sciences and Arts of Southern Switzerland (SUPSI Manno Switzerland).

Materials and Methods

Thirty six healthy participants (46.75 ± 6.2 years) volunteered for this investigation. A non-invasive electromagnetic device (Virtual Reality Rehabilitation System, Kymea, Padova, Italy) was used to detect cervical movements (Fig.1). Three sensors were positioned on each volunteer. In one session Participants were asked to perform six active movements, then one mobilisation was performed and the six movements were repeated, in the second session the same measurements were performed with the second technique. The two Cyriax (Atkins, 2016) techniques were the traction and the "AP Glide". Both of them are including traction without rotation. The distribution of the ROM was tested for normality with the One-Sample Kolmogorov-Smirnov Test. The results showed that the distribution in 21 out of 24 ROM resulting from the measurement session followed a normal Gaussian distribution of the value. The author therefore decided to perform the Paired samples t-test. The investigator chose to calculate the p-value to describe the difference between ROM variations.

Results

All of the rotations showed a statistically significant increase in ROM (Fig.3): right rotation and left rotation after traction were 0.036 and 0.004, respectively, and right rotation and left rotation after AP glide were 0.009 and 0.045, respectively. For flexion, both techniques showed no change in ROM (p=0.333, p=0.348 for traction and AP glide, respectively). The AP glide showed a highly significant increase in ROM (p=0.000356) for the extension, but no effect was found for traction (p=0.400). For the lateral bending, right lateral bending after traction had a significant change (p=0.030), while the other ROMs could not show a similar improvement; in left lateral bending (p=0.204 and p=0.342 for traction and AP glide, respectively) and left lateral bending (p=0.058 after AP Glide). The same six CROMs that showed a statistically significant difference had a difference in amplitude larger than the measure error, which is 2.5° (Koehrheim et al., 2003; Peary & Hindle, 1991).

Conclusion

The study results support the use of the two selected mobilisation techniques to increase the CROM. External validity is limited by the selection of healthy volunteers and by the small sample size.

REFERENCES: