The aim of this study was to compare the immediate effects, on pressure pain sensitivity and active mouth opening, following the application of neuromuscular or strain/counter-strain technique in latent myofascial trigger points (MTrPs) in the masseter muscle. Seventy-one subjects, 34 men and 37 women, aged 20–65 years old, participated in this study. Subjects underwent a screening process to establish the presence of MTrPs in the masseter muscle. Subjects were divided randomly into three groups: group A which was treated with a neuromuscular intervention, group B treated with the strain/counter-strain technique, and group C as control group. Each treatment group received a weekly treatment session during 3 consecutive weeks. Outcomes measures were pressure pain thresholds (PPTs), active mouth opening and local pain (visual analogue scale, VAS) elicited by the application of 2.5 kg/cm² of pressure over the MTrP. They were captured at baseline and 1 week after discharge by an assessor blinded to the treatment allocation of the subject. The ANOVA found a significant group×time interaction (F=25.3; p<0.001) for changes in PPT, changes in active mouth opening (F=10.5; p<0.001), and local pain evoked by 2.5 kg/cm² of pressure (F=10.1; p<0.001). Within-group effect sizes were large (d>1) for PPT and mouth opening, and moderate for local pain (d<0.7, 0.5) in both intervention groups; but small (d<0.2) for the control group in all outcomes. No significant differences between both intervention groups were found for any outcome (p>0.8). Our results suggest that neuromuscular or strain/counter-strain technique might be employed in the management of latent MTrPs in the masseter muscle.