Influence of sevoflurane and propofol on maximum muscular strength, speed of contraction and relaxation, in humans : a pilot study

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Statistical Methodology

For group comparisons of continuous data, we used the Wilcoxon-signed-rank test and medians and interquartile ranges were presented. Group comparisons of categorical variables were analysed with Chi-square.

We used linear mixed models to model the relationship of the different variable through time (Verbeke & Molenberghs, 2000). A group (propofol vs sevoflurane), time (pre-op vs post-op) and group*time effect were introduced in the model.

The R software (R Core Team, 2021), version 4.2.0. was used to produce the results.

Maximum force:

The Shapiro-Wilk's normality test indicates that the difference between the two measurement are normally distributed for the propofol (W = 0.93668, p-value = 0.2074) and the sevoflurane groups (W = 0.94524, p-value = 0.3006). We therefore used a parametric paired test. The paired T-test indicates no difference between the pre- and post- measurements of Maximum Force for the propofol group (t = 1.0649, df = 19, p-value = 0.3003) nor for the sevoflurane group (t = 0.34036, df = 19, p-value = 0.7373).

Maximum contraction speed:

The Shapiro-Wilk's normality test indicates that the difference between the two measurement are normally distributed for the propofol (W = 0.95028, p-value = 0.3713) and the sevoflurane groups (W = 0.93655, p-value = 0.2062). We therefore used a parametric paired test. The paired T-test indicates no difference between the pre- and post- measurements of Maximum Contraction Speed for the propofol group (t = 1.5218, df = 19, p-value = 0.1445) nor for the sevoflurane group (t = -0.37664, df = 19, p-value = 0.7106).

Maximum relaxation speed:

The Shapiro-Wilk's normality test indicates that the difference between the two measurement are normally distributed for the propofol (W = 0.95697, p-value = 0.4852) and the sevoflurane groups (W = 0.92793, p-value = 0.1409). We therefore used parametric paired tests. The paired T-test indicates that the difference between the pre- and post- measurements of Maximum relaxation speed is not significant at the chosen p value of 0.01 for the propofol group (t = -2.1475, df = 19, p-value = 0.04486) as well for the sevoflurane group (t = 1.6208, df = 19, p-value = 0.1215).