

MEDIAN NERVE CROSS-SECTIONAL AREA AND DEPTH CORRELATION WITH HEIGHT, WEIGHT, BMI, AND MID-ARM CIRCUMFERENCE

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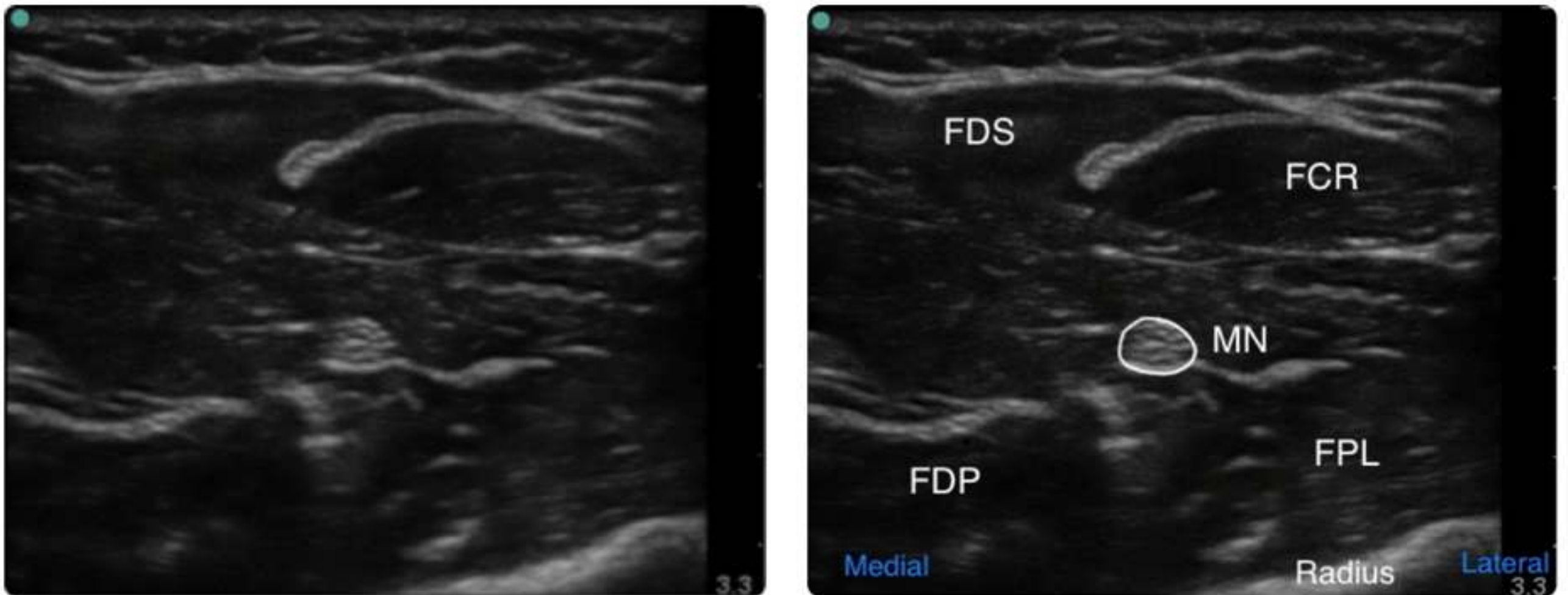


Figure 1

a) Ultrasound image of the median nerve with surrounding structures at the mid-forearm.

b) Annotated image: MN=median nerve, FDS=flexor digitorum superficialis, FCR=flexor carpi radialis, FDP= flexor digitorum profundus, FPL=flexor pollicis longus.

Background and Aims:

The aim of this study was to ascertain the relationship between median nerve cross-sectional area (CSA) and depth from skin with height, weight, BMI and mid-arm circumference in healthy volunteers.

Methods:

After formal assessment from the Health Research Authority, UK, data was collected from 21 healthy volunteers (7 males, 14 females), median age 39 years (range 22-63).

A SonoSite S-Nerve™ ultrasound machine was used to take an image of the median nerve at the mid-forearm using a 5-13MHz linear array probe. The inbuilt callipers were used to measure the nerve's CSA and depth. Height, weight, and mid-arm circumference was also recorded. The relationship between variables was evaluated using Spearman's rank correlation coefficient with STATA™ software.

Results:

The mean median nerve CSA was 0.09cm² (range 0.06-0.17). The correlation between nerve CSA and weight was positive and highly significant ($\rho=0.4132$, $p=0.0065$).

There was no significant correlation between CSA and BMI ($\rho=0.1524$, $p=0.3352$) or mid-arm circumference ($\rho=0.232$, $p=0.1391$).

Median nerve depth showed statistically significant positive correlations with weight ($\rho=0.5814$, $p=0.0001$), BMI ($\rho=0.7343$, $p=0.0000$), and mid-arm circumference ($\rho=0.6855$, $p=0.0000$). The correlation with height was not significant ($\rho=-0.0536$, $p=0.7362$).

Conclusions:

This study suggests that median nerve CSA, which determines the dose of local anaesthetics [1], correlates strongly with weight.

The depth of the nerve from the skin correlated most directly to the subject's BMI and mid-arm circumference.

References:

1. Latzke D, Marhofer P, Zeitlinger M et al. Minimal local anaesthetic volumes for sciatic nerve block; evaluation of ED99 in volunteers, British Journal of Anaesthesia, 2010, Vol 104, Issue 2, Pages 239-244