Young Adult Gender Differences in Forearm Skin-to-Fat Tissue Dielectric Constant (TDC) Values Measured at 300 MHz

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Objectives: Our goal was to assess male-female differences in TDC values associated with differing skin depths.

Background: Skin-to-fat TDC values depend on depth and gender but the role of gender is not clear.

Methods: Bilateral forearm TDC measurements were made on young males and females with ages from 24.7 to 27.3 years. There were four measurement groups distinguished by TDC measurement depth including the following numbers of subjects for each gender; 30, 150, 60 and 50 for probe-measurement depths of 0.5, 1.5, 2.5 and 5.0 mm. Data were compared to values calculated with a simple 2-layer model.

Results: For females and males there was a significant difference in TDC values among depths (p<0.001) with TDC values decreasing with increasing depth. Gender comparisons showed that TDC values of males were significantly (p<0.001) greater than values for females at each depth. Male-female percentage differences ranged from 14.8% to 22.0%. Model calculations suggest that gender-differences might be explained by skin thickness differences.

Conclusions: Findings indicate that decisions with regard to skin water content among or between groups based on TDC measurements need to account for gender and are best made when corresponding skin thickness measurements are available. However, changes in TDC values assessed in individual patients and comparisons between corresponding skin areas in affected and non-affected sites are not limited. Thus, assessments of acute treatment effects and assessments of inter-arm or inter-leg TDC differences or ratios within genders are a useful and suitable method to characterize edema and lymphedema features.