

Correlation among Anthropometric, Liver Transferase and Hepatic Density Values in Clinically Healthy Overweight and Obese Men and Women

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Introduction. Cardiovascular diseases risk in overweight and obese individuals having fatty liver disease (FLD) is higher than in people without FLD mostly due to adipokine effects, hepatic insulin resistance and subclinical inflammation. Liver density on computed tomography (LDCT) and liver transferase levels are both related to FLD diagnosis. Finding a patient-friendly and cost-effective way of screening patients for FLD and other cardiovascular risk indicators is an essential role of primary care.

The aim. The aim of the study is to analyse if there are any differences and correlations among liver transferase levels, liver density and anthropometric values that can be used as predictors of an increased cardiovascular risk in clinically healthy overweight and obese men and women

Materials and methods. 30 to 45 years old clinically healthy individuals with body mass index (BMI) over 25.0 kg/m² were selected. We measured fasting anthropometric values (waist, hips), as well as alaninaminotranferase (ALT), aspartataminotransferase (AST) and γ -glutamyltransferase (GGT) levels. We calculated average liver density according to liver computed tomography. Data of women and men were separately analysed and compared. We used Mann-Whitney U test and Spearman correlation coefficient for data analysis.

Results. 64 women and 33 men (mean age 36.8 \pm 3.7 and 36.8 \pm 4.1 years) were included. Mean BMI was the same in both groups (32.2 \pm 4.4 kg in women; 32.5 \pm 4.0 kg in men). Mean waist circumference and waist-hip ratio were larger in men than women (106.7 \pm 11.4 cm and 0.94 \pm 0.05; 96.3 \pm 10.5 and 0.83 \pm 0.06; $p < 0.001$), while there was no significant difference in hip circumference. Mean liver density was significantly lower in men than in women (49.98 \pm 10.77; 56.89 \pm 7.58; $p < 0.001$). Liver transferase levels were higher in men than in women: ALT (52.5 \pm 44.7; 23.0 \pm 7.5; $p < 0.001$), AST (36.4 \pm 33.8; 23.0 \pm 5.4; $p < 0.001$) and GGT (54.7 \pm 66.9; 18.0 \pm 10.0; $p < 0.001$). In both women and men liver density showed a significant negative correlation with ALT ($r = -0.396$, $p = 0.002$; $r = -0.545$, $p = 0.002$) and GGT ($r = -0.497$, $p = 0.001$; $r = -0.363$, $p = 0.049$), but only in women there was a significant correlation between waist circumference and waist-hip ratio with ALT ($r = 0.459$, $p = 0.001$; $r = 0.398$, $p = 0.001$), with GGT ($r = 0.302$, $p = 0.015$; $r = 0.376$, $p = 0.002$) and negative correlation with hepatic density ($r = -0.299$, $p = 0.019$; $r = -0.278$, $p = 0.030$).

Conclusions. Overweight and obese men show lower liver density and higher transferase levels compared to women, which could be related to more prevalent fatty liver disease in men.

Only in women larger waist circumference and waist-hip ratio could be considered as fatty liver disease predictors as they correlate with transferase levels and liver density.

In both genders higher ALT and GGT levels negatively correlate with liver density and could be considered as early predictors of higher cardiovascular diseases risk due to probable FLD.