Public Abstract

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Title:A Proposed Scoring System for Quantification of Metabolic Syndrome Severity

Metabolic syndrome (MetS) is a significant risk factor for cardiovascular disease, type 2 diabetes, and mortality. Currently, there is no established tool to quantify severity of MetS. Furthermore, it is unclear which trait(s) contribute the most to MetS presence. PURPOSE: The aims of the current study were to establish a scoring system for assessing presence and severity (number of traits) of MetS and to determine the most influential contributor to the incidence of MetS. METHODS: Overweight and sedentary adults (N=208) were obtained from previous exercise intervention studies at the University of Missouri and the University of Kansas. Measurement were obtained for the following traits: waist circumference (WC), fasting glucose (FG), high density lipoprotein cholesterol (HDL-C), systolic blood pressure (SBP), triglycerides (TG), body mass index (BMI), C-reactive protein (CRP), tumor necrosis factor Î± (TNFÎ±), percent body fat (% fat) and aerobic capacity (VO2max). Two MetS scoring systems were formulated: one including all five current NCEP ATP III MetS criteria (5score) and one including all 10 variables (10score). Traits were divided into quartiles with points assigned according to worsening metabolic profile. Additionally, weighted multipliers were added to reflect relative risk of each trait. MetS score was defined as the summary score of all traits. RESULTS: 5score displayed a sigmoidal relationship with MetS whereas 10score was linearly related to MetS risk. Both 5score (r2=0.74) and 10score (r2=0.23) were significant predictors of MetS severity (both p<0.0001). Backward elimination and forward selection revealed traits contributed to MetS in the following order: for women, HDL-C>FG>TG>SBP>WC, for men, TG>FG>WC>SBP>HDL-C, and combined TG>FG>HDL-C>SBP>WC. According to forward selection, HDL-C explained 21% (p<0.0001) of the null deviance in women and was the most influential factor for MetS incidence. TG was determined to be the most influential factor in men and combined, accounting for 34 and 27% of the null deviance, respectively (both p<0.0001). CONCLUSIONS: 5score and 10score are significant predictors of MetS presence and severity. Inclusion of redundant markers for obesity and inflammation in 10score may have weakened its relationship to MetS. Additionally, MetS traits behave differently between genders. HDL-C is the most influential contributor to incident MetS in women, whereas TG is the most influential factor in men and combined genders.