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**METABOLIC SYNDROME, FLOW-MEDIATED VASODILATION AND  
CARDIORESPIRATORY FITNESS – THE DR'S EXTRA STUDY**

Kai Savonen, Maija Hassinen, Pirjo Komulainen, Rainer Rauramaa. Kuopio Research Institute of Exercise Medicine, Kuopio, Finland.

**Objectives**

The metabolic syndrome (MetS) is characterized by an endothelial dysfunction which can be proved by a low flow-mediated vasodilation (FMD). We aimed to study whether the association of a low FMD with prevalence of MetS can be further defined by allowing for the cardiorespiratory fitness level.

**Methods**

A population-based sample of 593 men and 583 women aged 57-78 years who participated in the DR's EXTRA Study. MetS was determined by the NCEP criteria. FMD was assessed in the brachial artery using ultrasound and cardiorespiratory fitness as peak oxygen uptake ( $VO_{2peak}$ ) achieved in a maximal bicycle exercise test. Age-adjusted linear regression analysis was used to compare the means of FMD in those with or without MetS. For the main analyses, sex-specific tertiles of FMD and  $VO_{2peak}$  were pooled in age-adjusted logistic regression analyses and the association was explored after the lowest tertile of FMD (<3.0% in men, <3.6% in women) was further categorized according to tertiles of  $VO_{2peak}$  (low <23.3 and high >28.9 ml/kg/min in men; low <18.4 and high >22.8 ml/kg/min in women).

**Results**

Mean FMD was lower in 323 (27%) subjects with MetS compared to those without MetS (4.5 vs. 4.9%,  $p=0.01$  for difference between groups). Subjects ( $n=144$ ) with a low FMD and a low  $VO_{2peak}$  had an increased risk of having MetS (OR 3.6 [95% confidence interval 2.4-5.3],  $p<0.001$ ) compared to subjects with higher FMD (the two highest tertiles). Additionally, 114 subjects with a low FMD but a high  $VO_{2peak}$  had a decreased risk of having MetS (OR 0.3 [0.2-0.6],  $p<0.001$ ) compared to subjects with higher FMD.

**Conclusions**

The low FMD group includes subjects with an unfavourable metabolic profile judged by an increased risk of having MetS, but also subjects with a decreased risk of having MetS. These groups can be identified based on cardiorespiratory fitness.