OBSERVATIONS

Lower Vital Capacity Is Associated With Diabetes but Not With Metabolic Syndrome in Nonobese Japanese Men

Lower vital capacity has been reported to be a predictor of diabetes in Western countries (1–3) and has also been reported to be associated with diabetes and other metabolic risk factors in Japanese middle-aged men (4). However, there is no report on the relationship between lower vital capacity and metabolic syndrome or diabetes in nonobese subjects. We studied cross-sectional relationships among percent vital capacity (%VC) and diabetes and metabolic risk factors using medical checkup data from 2,079 men and 1,215 women who visited our Medical Checkup Center and gave signed informed consent between April and December 2008. Subjects with blood levels of high-sensitivity C-reactive protein (hs-CRP) ≥10 mg/l or without respiratory function data were excluded. The prevalence of diabetes and metabolic syndrome (defined by the revised National Cholesterol Education Program [NCEP] criteria [5] for Japanese: waist circumference ≥90 cm in men and ≥80 cm in women) was significantly higher in obese subjects (defined as BMI ≥25 kg/m^2) with lower %VC (≤96%) than in those with higher %VC (≥97%). However, the prevalence of diabetes (3.9% vs. 1.9%, $P < 0.05$), but not metabolic syndrome (4.7% vs. 4.8%, $P = 0.95$), was significantly higher in nonobese men with lower %VC who received no antihypertensive or antihyperlipidemic medication ($n = 618$, mean ± SD age 49.1 ± 9.0 years) than in those with higher %VC ($n = 630$, age 50.5 ± 8.4 years), despite the fact that age, BMI, body fat percent, waist circumference, systolic blood pressure, and diastolic blood pressure were significantly lower in subjects with lower %VC than in those with higher %VC ($P < 0.01$, $P < 0.0001$, $P < 0.01$, $P < 0.0001$, $P < 0.05$, and $P < 0.05$, respectively). The prevalence of diabetes (0.4% vs. 0.9%, $P = 0.55$) or metabolic syndrome (2.2% vs. 2.5%, $P = 0.72$) was not significantly different between nonobese women with lower %VC ($n = 465$, age 48.2 ± 9.2 years) and those with higher %VC ($n = 437$, age 50.4 ± 8.5 years), and age, BMI, body fat percent, and waist circumference were significantly lower in nonobese women with lower %VC who received no antihypertensive or antihyperlipidemic medication than in those with higher %VC ($P < 0.001$, $P < 0.0001$, $P < 0.001$, and $P < 0.001$, respectively). Fasting glucose, triglycerides, HDL cholesterol, hs-CRP, and white blood cell count were not significantly different between nonobese subjects with lower %VC and those with higher %VC. Thus, lower vital capacity was associated with lower BMI in nonobese Japanese men and women, and the association between lower vital capacity and diabetes in nonobese Japanese men may involve factors other than metabolic syndrome or insulin resistance.

Eiji Oda, MD
Ryu Kawai, MD

From the Medical Checkup Center, Tachikawa Medical Center, Nagaoka, Japan.
Corresponding author: Eiji Oda, ijie@venus.sannet.ne.jp.
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