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ORIGINAL ARTICLE

Hematological parameters are associated with metabolic syndrome in Japanese community-dwelling persons

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Abstract Hematological parameters including red blood cell (RBC) count, hematocrit (Hct), and hemoglobin (Hgb) are independently associated with insulin resistance. The aim of this study was to determine whether hematological parameters are associated with metabolic syndrome (MetS), and its components, independent of gender, body mass index (BMI) and other confounders of cardiovascular disease. A total of 692 men [60 ± 14 (mean ± standard deviation); 20–89 (range) years] and 1,004 women (63 ± 12; 21–88 years) participants without diabetes were recruited from a single community at the time of their annual health examination. We examined the relationship between hematological parameters and insulin resistance assessed by Homeostasis model assessment of insulin resistance (HOMA-IR), MetS, and its components. RBC count, Hct, and Hgb were all significantly associated with measures of HOMA-IR. Multiple linear regression analyses for HOMA-IR showed that RBC count, Hct, and Hgb were all shown to be independently and significantly associated with HOMA-IR as well as gender, BMI, alcohol consumption, current smoking status, γ-glutamyltransferase, high molecular weight adiponectin, and uric acid. Inclusion of hematological parameters into the model further increased the coefficient of determination (R^2). Compared to participants with the lowest quartile of Hct, multivariate-adjusted odds ratio for insulin resistance (HOMA-IR ≥ 1.74) was 2.27 [95 % confidence interval (CI), 1.55–3.31] for the third quartile, and 3.78 (95 % CI, 2.38–5.99) for the highest quartile. Hct was significantly and strongly associated with increased HOMA-IR levels. Hematological parameters were positively associated with insulin resistance and prevalence of MetS in Japanese dwelling-community persons.

Keywords Hematocrit · Insulin resistance · HOMA-IR · Metabolic syndrome

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Introduction

Metabolic syndrome (MetS), a clustering of cardiovascular risk factors such as visceral obesity, insulin resistance, raised blood pressure, hypertriglyceridemia, low high-density lipoprotein cholesterol (HDL-C), and impaired fasting glucose levels, is a major worldwide public health problem because it increases the risk of diabetes [1] and cardiovascular disease (CVD) [2]. In Japan, the prevalence