Relationship between Periodontal Status and Components of Metabolic Syndrome in a Rural Japanese Population

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Abstract: As part of Japan’s Health Care Reform 2008, health check-ups to detect symptoms of metabolic syndrome were made mandatory; however, they do not include a dental health program. Limited information is available on the association between metabolic syndrome and periodontal disease. In the present study, we determined the association between the components of metabolic syndrome and periodontal status in a rural community in Japan. A total of 246 residents (30–64 years old) participated in a comprehensive health screening. The medical examination included anthropometric and manometric measurements and blood chemistry tests. Periodontal status was assessed using the Community Periodontal Index scoring method and subjects with the score of 3 or 4 were considered to have periodontitis. Participants taking medication for diabetes mellitus, hyperlipidemia or hypertension were counted as positive for high fasting blood glucose, dyslipidemia or high blood pressure, respectively. Chi-square tests and stepwise logistic regression analysis were used to estimate the association between each component of metabolic syndrome and periodontal status. A total of 41.0% of subjects were considered to have periodontitis. Significant differences between subjects with and without periodontitis were observed in age, gender, blood pressure and fasting blood glucose level ($p<0.001$, $p=0.001$, $p=0.008$ and $p<0.001$, respectively). A stepwise logistic regression model showed that subjects with a fasting blood glucose level $\geq 110$ mg/dl were at increased risk of having periodontitis (adjusted odds ratio = 2.118, $p=0.049$). The results indicate that a high fasting blood glucose level might be a potential indicator for the presence of periodontal disease in this rural Japanese population with a low prevalence of metabolic syndrome. Residents with high levels of fasting blood glucose are recommended to be informed of the correlation between periodontal disease and diabetes mellitus in health check-ups for metabolic syndrome.

Key words: Fasting blood glucose, Epidemiology, Metabolic syndrome, Periodontal disease

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Introduction

Metabolic syndrome is characterized by abdominal obesity, hypertriglyceridemia, a low high-density lipoprotein (HDL) cholesterol level, high blood pressure and high fasting glucose level\textsuperscript{a}. The syndrome is a risk factor for diabetes mellitus\textsuperscript{a} and cardiovascular disease\textsuperscript{a}. As the prevalence of metabolic syndrome is increasing worldwide\textsuperscript{a}, it is a major public health problem, including causing an increase in Japanese national health care expenditure\textsuperscript{a}.

Epidemiological studies have reported an association between each component of metabolic syndrome and periodontal disease. Obesity is significantly associated with periodontitis in terms of the body mass index\textsuperscript{a} and waist-hip ratio\textsuperscript{a}. A survey of 8,032 adults reported that patients with periodontitis showed higher values of systolic and diastolic blood pressure than subjects with a

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