

学位論文の要旨

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学位論文名 Association Between Metabolic Syndrome and Prevalence of Gastroesophageal Reflux Disease in a Health Screening Facility in Japan

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論文内容の要旨

INTRODUCTION

Gastroesophageal reflux disease (GERD) is characterized by the presence of esophageal mucosal injury or reflux symptoms caused by abnormal reflux of gastric contents into the esophagus. Metabolic syndrome, defined as a cluster of risk factors that predisposes individuals to atherosclerotic cardiovascular and other chronic diseases, has been drawing increasing attention. According to the Japanese criteria for metabolic syndrome newly established in 2005, the condition is diagnosed based on the 4 factors of visceral fat accumulation, dyslipidemia, hypertension, and hyperglycemia, while each has been suggested to correlate with the occurrence of GERD. Therefore, we conducted the present study to investigate the association between metabolic syndrome and prevalence of GERD, as well as the impact of those factors used as criteria for metabolic syndrome on the occurrence of GERD.

MATERIAL AND METHODS

We examined 3968 adults who visited National Hospital Organization Hamada Medical Center for annual medical check-ups from April 2010 to March 2011. After a medical history was taken, all were subjected to physical examinations, hematological and biochemical blood tests, and upper gastro-intestinal endoscopy. Individuals with a history of gastric surgery were excluded from this study, as were those with upper gastrointestinal endoscopy findings showing

upper gastrointestinal malignant disease or active gastroduodenal ulcers. In addition, individuals who had received anti-secretory drugs in the preceding 2 months were not included, when those anti-secretory drugs were given for therapy or prevention of gastroduodenal ulcers and/or dyspeptic symptoms in the epigastric portion. Therefore, 3775 subjects (mean age 52.0 years, range 24-81 years) were analyzed.

The Japanese criteria for metabolic and pre-metabolic syndrome were utilized. Waist circumference (WC) was measured at the navel level in a standing position, and visceral fat accumulation was determined as positive at WC \geq 85 cm for men and \geq 90 cm for women. Subjects diagnosed with metabolic syndrome had visceral fat accumulation along with 2 or 3 of dyslipidemia, hypertension, hyperglycemia, while those with visceral fat accumulation and only 1 of the above 3 components were diagnosed as having pre-metabolic syndrome.

The presence or absence of GERD symptoms was assessed by the Japanese version of the Carlsson-Dent self-administered questionnaire (QUEST). We defined subjects whose QUEST scores were 6 or more as positive for GERD symptoms. The subjects were diagnosed with GERD when endoscopically proven reflux esophagitis, GERD symptoms assessed by QUEST, and/or current administration of anti-secretory drugs for GERD were present.

The protocol of this study was approved by the ethics committee of the National Hospital Organization Hamada Medical Center and written informed consent was obtained from all subjects.

RESULTS AND DISCUSSION

Three hundred twenty (8.5%) and 604 (16.0%) subjects were positively diagnosed with reflux esophagitis and GERD. The number of subjects with metabolic and pre-metabolic syndrome 477 (12.6%) and 384 (10.2%), respectively.

Multiple logistic regression analysis showed that male gender, presence of hiatal hernia, mild gastric mucosal atrophy, pre-metabolic syndrome, and metabolic syndrome were significant predictive factors for the presence of reflux esophagitis. Significant predictive factors were nearly the same for the prevalence of GERD as for the presence of reflux esophagitis. When the analyses were performed after dividing the study subjects into male and female groups, hiatal hernia, mild atrophy, pre-metabolic syndrome, and metabolic syndrome were significant predictive factors for the presence of both GERD and reflux esophagitis in males, while pre-metabolic syndrome and metabolic syndrome were also significant risk factors for the prevalence of reflux esophagitis in female subjects.

When the factors used for diagnosis of metabolic syndrome were separately analyzed by multiple logistic regression analysis, visceral fat accumulation and untreated dyslipidemia were found to be significant predictive factors for the presence of both reflux esophagitis and GERD. Untreated hypertension and untreated hyperglycemia are considered to be risk factors for the prevalence of GERD and reflux esophagitis, while undergoing treatment for hypertension was also a significant predictive factor for the prevalence of GERD and reflux esophagitis in the present study. In contrast, odds ratios for subjects undergoing treatment for dyslipidemia and diabetes mellitus were lower as compared to those not undergoing such therapy.

The occurrence of GERD is related to multiple factors, such as gastric acid secretion, hiatal hernia, lower esophageal sphincter (LES) function, esophageal motility, and esophageal perception. Obesity has also been repeatedly reported as related to a high prevalence of reflux esophagitis and GERD symptoms, and high intra-abdominal pressure caused by abdominal fat accumulation has been demonstrated to induce gastroesophageal pressure gradient, development of hiatal hernia, and gastroesophageal reflux. In addition, dietary habits, such as alcohol intake and eating foods with high components of fat or in large portions, may cause not only visceral fat accumulation, but also frequent gastroesophageal reflux due to a reduction in LES pressure and increase in number of transient LES relaxations. In this study, we investigated the association of metabolic syndrome and prevalence of GERD in Japanese subjects, and our results clearly demonstrated that the presence of metabolic or pre-metabolic syndrome is a significant risk factor for prevalence of reflux esophagitis and GERD, along with visceral fat accumulation. Untreated dyslipidemia, hypertension, and hyperglycemia are considered to be risk factors for the prevalence of GERD, while medical therapy for hypertension also increases its prevalence. In contrast, medical care for dyslipidemia and diabetes mellitus may have an inhibitory effect on GERD prevalence. To the best of our knowledge, this study is the first to report the effects of medical therapy for dyslipidemia, hypertension, and hyperglycemia on the prevalence of GERD.

CONCLUSION

Metabolic syndrome is a reliable predictive factor for the prevalence of GERD and reflux esophagitis, while various medical treatments for that syndrome may modify the risk of GERD occurrence.