CHANGE OF COMPONENTS OF THE METABOLIC SYNDROME IN A WORKERS’ HEALTH CHECKUP AFTER FIVE YEARS—RELATION WITH ELEVATED LIVER ENZYMES, GENE POLYMORPHISMS FOR ALDH 2, β3-AR AND LIFESTYLE

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We previously reported that the prevalence of elevated alanine aminotransferase (ALT) increases with accumulation of metabolic syndrome components, and a greater degree of involvement of aldehyde dehydrogenase 2 (ALDH2) than β3-adrenergic receptor gene (β3-AR) polymorphisms. The present study was designed to clarify the effect of aging, lifestyle and the two gene polymorphisms on the relationship between 4 components of the metabolic syndrome (obesity, hypertension, dyslipidemia and impaired glucose tolerance) and elevated ALT values in a subset of 73 out of 148 male workers who were 35 years of age in the baseline study and 40 years old in the present study.

Study subjects completed questionnaires about drinking and smoking habits, and underwent urinalysis, physical examination and peripheral blood tests, blood chemistry, electrocardiogram and chest X-rays each year as required by Japanese law. Information from the questionnaires and physical examinations, including liver function tests, were compared with previously reported ALDH2 and β3-AR genotypes for the 73 workers.

Of the 73 workers studied, 14 (19%) demonstrated decrease in metabolic syndrome components, 39 (53%) demonstrated no change, and 20 (27%) demonstrated an increase. Ten workers (14%) showed liver dysfunction at age 35 and 20 workers (27%) at age 40. Fourteen workers were newly diagnosed as having liver dysfunction at their 40-year checkup, thus being associated with the BMI and an active ALDH2 genotype. Accumulation of components of the metabolic syndrome were associated with the presence of liver dysfunction at 35 years.

In conclusion, these findings indicate that ALDH2 genotyping as well as lifestyle habits may be important factors in causing metabolic syndrome with liver dysfunction.

**Key words**: metabolic syndrome, alanine aminotransferase (ALT), ALDH2, β3-AR