

Effect of long-term consumption of boiled high β -glucan barley-rice on serum cholesterol concentrations in elderly participants

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Abstract

The beneficial effects of waxy barley have been approved by food agencies worldwide. The newly bred waxy barley, Kirarimochi, contains more water-soluble β -glucan than other barleys. This study aims to clarify the cholesterol-lowering effect of long-term, daily Kirarimochi barley consumption in elderly participants. We examined the change in serum low-density lipoprotein cholesterol (LDL-C) and high-density lipoprotein cholesterol (HDL-C) concentrations of thirty-five participants with high Hemoglobin A1c (HbA1c) levels, aged 59-76 years, before-and-after consumption of boiled Kirarimochi barley-rice (30% / 70% [w/w]) for six months. Participants were required to take boiled barley-rice dish three times per day, and estimated number of boiled barley-rice dishes consumed by one participant was about 2.1 times per day in average. As a result, barley-rice consumption for six months significantly lowered serum LDL-C and HDL-C concentration in the hyper-LDL-cholesterolemic participants and showed no significant effect on serum LDL-C or HDL-C concentrations in normo-LDL-cholesterolemic participants. In addition, barley-rice consumption significantly lowered serum HDL-C concentrations in the participants whose serum HDL-C concentration was higher than 64 mg/dL (the average and median of HDL-C level in 35 participants) but did not in those whose serum HDL-C concentration was lower than 64 mg/dL. These results indicate that long-term daily consumption of waxy barley Kirarimochi offers a beneficial mean to lower their LDL-C level in hyper-LDL-cholesterolemic elderly patients.

Keywords : waxy barley, Kirarimochi, boiled barley-rice, hypercholesteremia, serum cholesterol, barley β -glucan, elderly

I Introduction

The elderly population is expected to continue growing in Japan, and the elderly are expected to be 31.6% of the population in 2030 (based on Population Estimates, Statistics Bureau, Ministry of Internal Affairs and Communications). The population of elderly people aged 65 or older in the city of Mimasaka, Okayama Prefecture, was 11,079 as of October 1st, 2018 (based on Basic Resident Registration data), which accounts for 40.0% (aging rate) of the total population. According to Regional Population Projections for Japan, the aging rate of Mimasaka will reach 41.4% by 2030, which

means that about two in five residents of Mimasaka will be over the age of 65 within ten years. The prevention of chronic disease is an urgent issue because the increase in the elderly population is accompanied by an increase in the number of people with lifestyle-related diseases, such as hypertension, diabetes, dyslipidemia, and obesity. In fact, a report on Specific Health Checkups conducted in Mimasaka in 2016 showed that 59% and 50% of male and female recipients, respectively, 40 years to 74 years of age, had high blood sugar levels and 64% and 73%, respectively, had high serum cholesterol levels. This discouraging health situation could explain the high mortality rate for cardiovascular disorders among the residents