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INCREASED CONCENTRATIONS OF BREATH HYDROGEN GAS ORIGINATED FROM INTESTINAL BACTERIA MAY BE RELATED TO PEOPLE'S LONGEVITY IN JAPAN

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Hydrogen gas produced by intestinal fermentation is suggested to have some preventive effects on age-related diseases. As reported in our previous paper, hydrogen gas concentrations in the breath, reflecting the intestinal production, were measured in 14 healthy controls (8 men, 6 women; 37.3 (17.4) years) and 15 elderly people with type 2 diabetes (4 men, 11 women; 79 (6) years) 26 centenarians (6 men, 20 women; age, 102 (2) years (mean (SD)) and 16 their offspring (7 men, 9 women; 70 (5) years), and were found to be significantly increased in centenarians. In that study, diabetic patients treated with α -glucosidase inhibitors were excluded, which can cause carbohydrate malabsorption leading to increasing intestinal fermentation. In the current study, 28 diabetic patients (11 men, 17 women; 69 (13) years) including 6 patients treated with α -glucosidase inhibitors were studied. Three patients treated with α -glucosidase inhibitors showed extremely high concentrations of breath hydrogen gas, which were compatible to those in a part of centenarians, and low concentrations of serum oxidative low-density lipoprotein (MDA-LDL). No significant correlation was found between breath hydrogen gas and serum MDA-LDL concentrations. Thus, hydrogen gas produced by intestinal fermentation in association with diet and gut microbiome may affect people's longevity in Japan, considering the potential of hydrogen gas to act as a potent antioxidant in the body.

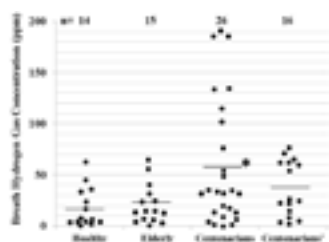


Figure 1: Each dot shows the hydrogen gas concentration between 11:00 and 11:30, after breakfast (all breakfasts were taken after breakfast). The same concentration (left) seen in the centenarians was higher than that in the other groups. $^*p < 0.05$ vs. controls and diabetes by ANOVA followed by Student's *t*-test.

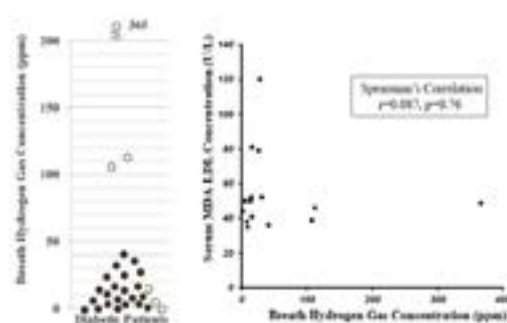


Figure 2: (Left) Breath hydrogen gas concentration in 28 diabetic patients. Open circles represent patients treated with α -glucosidase inhibitors, whose breath hydrogen gas was not necessarily increased. (Right) Correlation between breath hydrogen gas concentration and MDA-LDL concentration in 15 diabetic patients. Patients with high breath hydrogen gas concentrations may have low serum oxidized LDL levels.

Biography

Dr. Yuji Aoki is the Director of the Outpatient Department, and head of the Lifestyle Disease Laboratory, National Hospital Organization Matsumoto Medical Center, Matsumoto, Japan. He is a Visiting Clinical Professor of Internal Medicine, Matsumoto Dental University Hospital, Shiojiri, Japan. He got his Medical Doctor in 1981 and Ph.D.-medicine in 1993 at Shinshu University School of Medicine, Matsumoto, Japan.

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