Popular Home-Made Fermented Milk Improves Nutritional and Immunological Responses against Influenza Vaccination in Handicapped Japanese

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Objectives

- WHO warns the pandemic of a new avian influenza to which the elderly and children are vulnerable.
- In handicapped children, influenza vaccination is less effective because impaired immunity.
- Therefore, the effect of a popular home-made fermented milk (yogurt) with *Lactococcus Lactis subsp. cremoris FC.(FC)* was studied in handicapped persons, since we previously observed the immunopotentiation of the vaccination and nutritional improvement by a commercial LC1 yogurt in the elderly inmates of a nursing home.

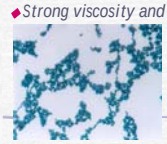
Methods

- Subjects: From among 35 males and 26 female patients aged 15-72 with severe motor and intellectual disabilities, 60 patients were vaccinated against influenza virus (H1N1, H3N2).
- **Test Yogurt** Fermented milk manufactured with only one starter culture of *FC.*
- **Placebo Yogurt** Non-fermented gelled milk with similar texture, acidity and taste.
- Blood analyses :General laboratory tests, trace element, pre-albumin, albumin, serum protein, antibody title against influenza, and high sensitivity C-reactive protein (CRP) of fasting blood.
- A double-blind placebo controlled randomized study approved by an Ethical Committee.

Test Yogurt

- A yogurt sample, so called Caspian sea yogurt now widely home-made in Japan was brought back by Dr. Yamori in 1986 from a longevity village in the Caucasus region for the nutrition analysis of WHO coordinated Cardiovascular Diseases and Alimentary Comparison (CARDIAC) study.

- Strong viscosity and less acidic taste are liked by Japanese people.

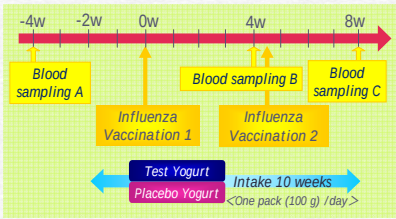


- The number of viable cells of *FC* was more than 7.3×10^7 CFU/g after two weeks of storage at below 10 ℃.

Nutritional Contents of Test Yogurt and Placebo (100g)

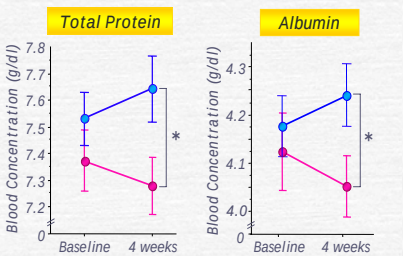
	Test yogurt	Placebo
Energy (kcal)	68	76
Fat(g)	4.0	3.7
Protein (g)	3.4	3.5
Na (mg)	43	61
Dietary fiber (g)	0	0.8

Protocol

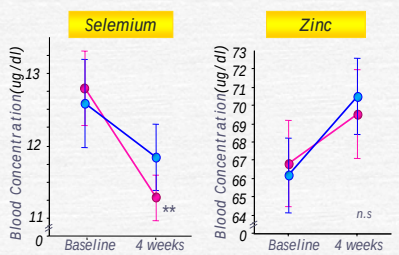


Vaccination 1 : All patients. (n=60)
Vaccination 2: Patients with serum antibody titer to H1N1 or H3N2 < 40 at blood sampling B. (n=40)

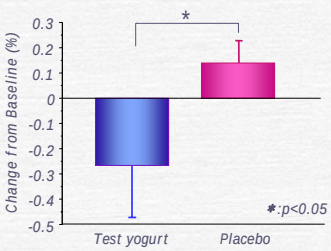
Changes in Total Protein and Albumin



Changes in Selenium and Zinc

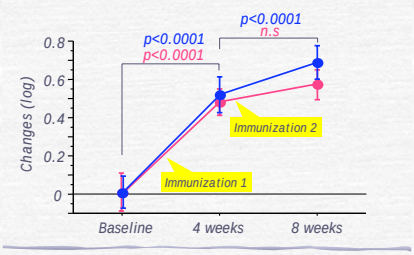


Changes in High Sensitivity CRP

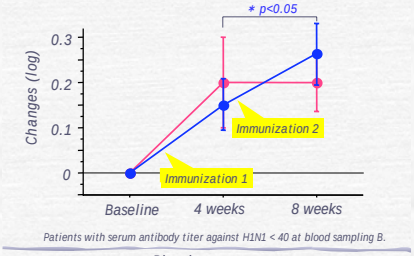


CRP =C-Reactive Protein

Effect of Test Yogurt on Antibody Titer against H3N2



Effect of Test Yogurt on the Serum Antibody Titer to H1N1



Conclusions

- Daily intake of 100g yogurt *(Lactococcus lactis subsp, cremoris FC.)* could improve the intestinal nutrient absorption and induced the immunopotentiation in handicapped persons, vulnerable to influenza.
- The down-regulation of inflammatory CPR suggests the yogurt intake may contribute to prevention against atherosclerosis in which inflammatory cytokines are involved.

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