

Influence of nutrient materials on the absorption of various minerals

Yoshinori Miura¹, Ryujin Endo², Kenichiro Ikeda³, Atuya Shimizu⁴,
Koichiro Sera⁵ and Akira Suwabe¹⁾

¹ Department of Laboratory Medicine, School of Medicine, Iwate Medical University
19-1 Uchimaru, Morioka 020-8505, Japan

² Department of Internal Medicine, School of Medicine, Iwate Medical University
19-1 Uchimaru, Morioka 020-8505, Japan

³ Ikeda Clinic
5-18 Sakaida, Morioka 020-0041, Japan

⁴ Saiseikai Matsusaka General Hospital
1-15-6 Asahi, Matsusaka 515-8557, Japan

⁵ Cyclotron Research Center, Iwate Medical University
348-58 Tomegamori, Takizawa 020-0173, Japan

Abstract

[Introduction] Although percutaneous endoscopic gastrostomy (PEG) feeding is widely used as a convenient method for long-term nutritional support, administration of liquid nutrients is often accompanied by complications such as vomiting or diarrhea. Vomiting caused by gastro-esophageal reflux (GER) may cause critical conditions such as aspiration pneumonia. To avoid this complication, semi-solidified enteral nutrition formulations are used in hospital- and home-based care. However, the influence of nutrient materials on the absorption of various minerals has not been fully understood.

[Samples and Methods] In this study, we subjected the patients, who were replaced with PEG, in the following three groups. Namely, the liquid nutrient materials administrated group (17 cases), the low viscosity semi-solidification nutrient materials administrated group (17 cases), and the high viscosity semi-solidity nutritional supplement administrated group (18 cases). Blood samples were collected from the patients on the day of PEG and one and two weeks after PEG. We measured the contents of Fe, Cu, Zn, Se, Ca, Mn and Mg in these sera by a PIXE method and analyzed the changes of these minerals by repeated measures ANOVA.

[Results] The results demonstrated that serum Fe concentration in the liquid group was increased one week after PEG but those in other two groups were decreased. Significant difference in serum Fe concentration was found in the different kinds of nutrient materials ($F=2.956$, $p < 0.05$). Serum Cu concentration was significantly decreased with time, but the difference between three groups was not recognized ($F=5.146$, $p < 0.01$). The Zn concentration in the liquid group trended to be increased, but that in the high viscosity group was decreased, although they were not statistically significant. We did not observe the significant changes in the other elements in this study.