

The effect of probiotics combined with early enteral nutrition on severe craniocerebral patient: Gastrointestinal motility and infection

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Background: Gut microbiota is closely related to the gastrointestinal motility and immunity. The disorder of gut microbiota after severe craniocerebral injury will lead to gastrointestinal motility disturbance, immunity imbalance, and aggravate infection. Probiotics have increasingly drawn extensive attention from researchers and clinicians. It has been reported that probiotics can regulate the imbalance of gut microbiota and thereby show positive effect on gastrointestinal motility, intestinal immunity, and infection. The present single-blind randomized controlled trial was conducted to investigate the effect of probiotics combined with early enteral nutrition on gastrointestinal motility, rate of infection, ICU length of stay and mortality in patients with severe craniocerebral injury.

Methods: 62 patients with severe craniocerebral injury were randomized with a ratio of 1:1 into observation group or control group. All patients received enteral nutrition within 24~72 hrs following hospital admission by nasogastric tube. In addition, the observation group were administered probiotics (Trade name: Golden Bifid; Ingredient : *Bifidobacterium longum*, *Lactobacillus bulgaricus* and *Streptococcus thermophilus*; Specification: 0.5g/ tablet, no less than 0.5×10^7 CFU living *Bifidobacterium*, 0.5×10^6 CFU living *Lactobacillus bulgaricus* and *Streptococcus thermophilus*) for 15 days, 3.5g/ time, 3 times / day. Rate of abdominal distention, vomiting, gastro-oesophageal reflux, gastric retention, diarrhea and constipation during the whole study were recorded. Time to first defecation, time to targeted nutritional goals, infection rate and ICU length of stay were also recorded. Moreover, venous blood samples were collected in the morning on days 0, 4, 7, 15 to determine the serum levels of white blood count (WBC), C-reactive protein (CRP) and procalcitonin (PCT). The data were analyzed using the statistical software program SPSS13.0. For continuous variables, differences between groups were tested with Student's t test, Comparisons of categorical data were done by chi-squared test or Fisher's exact test. Two-sided $P < 0.05$ was considered statistically significant.

Key results: The observation group showed a lower gastro-oesophageal reflux and constipation rate (4% vs 27%, $P < 0.05$) 14% vs 57%, $P < 0.05$). In comparison with the control group, time to first defecation and time to targeted nutritional goals in observation group were significantly shorter (5.04 ± 2.03 vs 6.53 ± 2.26 , $P < 0.05$, 4.22 ± 0.57 vs 4.78 ± 1.19 , $P < 0.05$). Observation group showed a lower level of WBC, CRP and PCT on day 15 (8.01 ± 2.48 vs 10.32 ± 4.5 , $P < 0.05$, 29.04 ± 33.98 vs 70.37 ± 88.11 , $P < 0.05$; 0.19 ± 0.24 vs 1.99 ± 4.02 , $P < 0.05$). Total infection rate and pulmonary infection rate in observation group were significantly lower compared with control group (46.43% vs 83.33%, $P < 0.05$) 42.85% vs 80%, $P < 0.05$). ICU length of stay in observation group was shorter than that in the control group (9.36 ± 6.61 vs 13.0 ± 6.41 , $P < 0.05$).

Conclusion: Probiotics combined with early enteral nutrition can dramatically improve the gastrointestinal motility and enhance the body immunity, which could result in a decreased nosocomial infection rate and shorter ICU length of stay. Therefore, the combination of probiotics and early enteral nutrition prove to be a promising treatment for patients with severe craniocerebral injury.

Biography

Zhu Jingci, professor of the Third Military Medical University, doctoral supervisor of nursing, Research area is nutritional support for severe trauma patients and nursing higher education. She served as the head nurse of department of neurosurgery, nursing department director at the third affiliated hospital of Third Military Medical University, and dean of the school of nursing at the Third Military Medical University successively. Currently she is the leader of nursing group of National Trauma Society, the leader of the key subject of nursing discipline in Chongqing, the Nursing Administration Committee Chairman of Chongqing, and the editor of "Journal of traumatic surgery" and "Chinese nursing research".

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