

Real-time PCR Analysis of Intestinal Microbiota in Peritoneal Dialysis Patients

Chiung-lin Chen¹, MD; I-Kuan Wang^{1,2}, MD; Hsueh-Chou Lai³, MD; Cheng-Ju Yu³, MD;

Chih-Chia Liang¹, MD; Chiz-Tzung Chang¹, PhD; Huey-Liang Kuo¹ MD, Ya-Fei Yang¹, MD;

Chung-Chih Lin¹, MD; Hsin-Hung Lin¹, MD; Yao-Lung Liu¹; MD; Chiu-Ching Huang¹, MD;

Hung-Chih Lin⁴, MD.

¹Divisions of Kidney Disease, China Medical University Hospital, Taichung, Taiwan

²Department of Internal Medicine, College of Medicine, China Medical University, Taichung, Taiwan

³Department of Gastrointestinal Disease, China Medical University Hospital, Taichung, Taiwan

⁴Department of Pediatrics, China Medical University and Hospital, Taichung, Taiwan;

Abstract

Bifidobacterium and *Lactobacillus* can beneficially affect the host by producing acetic acid and lactic acid which lower pH and thereby inhibits the growth of pathogens or by competing with pathogens for epithelial adhesion sites and nutrients. The transmural migration of enteric organisms into the peritoneal cavity can cause peritonitis in peritoneal dialysis (PD) patients. We hypothesized that the intestinal microbiota such as *Lactobacillus* species and *Bifidobacterium* species differed between PD patients and healthy controls. The aim of the study was to investigate these differences by real-time polymerase chain reaction (PCR) analysis of fecal samples. From August 1, 2009 to March 31, 2010, a total of 29 nondiabetic PD patients and 41 healthy controls from China Medical University Hospital were recruited after giving their informed consent. Fecal samples were collected from the PD patients and their age-matched counterparts in the morning using a standardized procedure. DNA extracted from these samples was analyzed by real-time PCR. All *Bifidobacteria*, *Bifidobacterium catenulatum*, *B. longum*, *B. bifidum*, *Lactobacillus plantarum*, *L. paracasei* and *Klebsiella pneumoniae* were less frequently detected in the patient samples.

Dysbiosis (microbial imbalance) may impair intestinal barrier function and increase host vulnerability to pathogen invasion. Further studies are necessary to confirm our findings before clinical trials with probiotics supplementation in PD patients.

Key Words: End stage renal disease, dialysis, *Bifidobacterium*, *Lactobacilli*.