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Revolutionizing CKD Management: Synbiotic Supplementation as a Breakthrough in Curbing Hyperphosphatemia and Hyperparathyroidism

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Objectives : Patients with chronic kidney disease (CKD) face the challenge of accumulating toxic substances, leading to hyperphosphatemia and subsequent hyperparathyroidism, contributing to CKD-related mineral bone disorder (CKD-MBD). Alterations in gut microbiota further exacerbate these issues. This study explores the effects of synbiotic supplementation to regulate the hyperphosphatemia, and hyperparathyroidism in CKD rats.
Methods : We employed a 12-week study design using male Wistar rats, inducing CKD through intraperitoneal injections of cisplatin. Post-induction, the subjects were administered a synbiotic combination comprising 10^9 CFU of Lactobacillus salivarius, Bifidobacterium longum, inulin and chitosan oligosaccharide for 12 weeks. L. casei served as the control probiotic.
Results : The treatment induced a modest shift in gut microbiota diversity, favoring beneficial bacteria in the rat intestine. Notably, it promoted intestinal barrier function, resulting in decreased hyperphosphatemia and hyperparathyroidism, without significant changes in bone density. These findings suggest that the synbiotic treatment approach holds promise for alleviating hyperphosphatemia and hyperparathyroidism in CKD-MBD, offering therapeutic implications for managing renal osteodystrophy and vascular calcification.
Conclusions : Our findings demonstrate that synbiotic supplementation can effectively ameliorate hyperphosphatemia and hyperparathyroidism in CKD through the modulation of gut microbiota and enhancement of intestinal barrier integrity. These outcomes highlight the therapeutic potential of synbiotics in CKD-MBD management. However, further research is necessary to fully understand the scope and mechanisms of these benefits, paving the way for clinical applications in human subjects.