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Effect of AST-120 and synbiotics on the gut microbiome in chronic kidney disease patients, a randomized-controlled trial

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Objectives : We aimed to investigate the effects of AST-120 and synbiotics on gut microbiome composition and sarcopenia in patients with CKD.
Methods : This study was a multicenter, randomized controlled trial involving patients with CKD. Adults aged ≥20 years with serum creatinine levels ranging from 2.0 to 5.0 mg/dL, irrespective of the underlying etiology of CKD, were included. A total of 150 patients who provided informed consent were randomly assigned in a 1:1:1 ratio to one of three groups: placebo, AST-120 (Kremezin, HK inno.N, Corp.; 2 g orally three times daily), or AST-120 plus synbiotics (Nutine Xylobiotics, HK inno.N, Corp.; 1 pack/day). The intervention was administered for six months.
Results : A total of 145 patients (placebo: 49, AST-120: 47, AST-120 plus synbiotics: 49) completed the six-month treatment and follow-up. After the six-month intervention, no significant differences were observed in clinical laboratory findings among the groups. However, levels of indoxyl sulfate were significantly lower in the AST-120 and AST-120 plus synbiotics groups compared to the placebo group (0.69 ± 0.49 mg/mL in the placebo group vs. 0.42 ± 0.50 mg/mL in the AST-120 group and 0.45 ± 0.41 mg/mL in the AST-120 plus synbiotics group; P = 0.032). In gut micriobiome analysis, placebo group showed that Bacteroides fragilis, Hungatella hathewayi were abundant. In the AST-120 group, Catenibacterium and Lactiplantibacillus plantarum were predominant. In the AST-120 plus synbiotics group, there was an increase in Agathobacter, Coprococcus comes, and Lachnoclostridium.
Conclusions : AST-120 monotherapy induced beneficial alterations in the gut microbiome, while the combination of AST-120 and synbiotics further enhanced the abundance of SCFA-producing bacteria and probiotic-related species, promoting a more favorable gut microbial balance. These findings suggest that AST-120 and synbiotics may have a synergistic effect in modulating the gut microbiome, potentially leading to improved renal and systemic health outcomes in CKD patients.

Result_histogram.png