**INTRODUCTION**

Chronic Kidney Disease (CKD) affects over 200 million people worldwide. CKD patients accumulate various uremic toxins in the blood, of which many are derived or produced by the pathogenic gut microbes. Advanced CKD alters the composition and functions of the intestinal microbiome. Colonic microbiota are increasingly acknowledged to be an important source of uremic toxins. p-Cresyl sulfate, Indoxyl sulfate and Trimethylamine N-oxide (TMAO) are currently attracting much attention as nouvovascular toxins. CKD is also associated with high levels of systemic inflammation and small intestinal bacterial overgrowth (SIBO) due to bacterial translocation and an imbalanced gut microbiota called gut dysbiosis. Pathobionts outweigh the good bacteria in CKD gut. Probiotics can help alleviate all of these by various mechanisms.

**METHODS**

Probiotic bacteria benefit human health in various ways. We reviewed data from various scientific groups which are working towards understanding the role of the gut microbiome in CKD. This poster presentation is a review summary of the possible ways in which probiotic bacteria can benefit CKD population.

**RESULTS**

Published data have shown that in CKD patients probiotics work by three different mechanisms.

1) Specific strains of probiotic bacteria can metabolize the accumulated nitrogenous wastes thereby reducing serum levels of uremic toxins and also reduce SIBO 1,2,3,4.

2) Several of these probiotic Lactobacilli and S. thermophilus produce a wide range of bacteriocins which are small, ribosomally-synthesized peptides with narrow or broad spectrum antimicrobial activity against both gram positive and gram negative pathogens residing in the gut. The pathogens are competitively excluded and reduction of these pathogenic bacteria in the gut leads to repair of the gut barrier integrity. Probiotic Bifidobacteria promote the growth of butyrate producers. Butyrate is the energy source for colonocytes and increased levels of butyrate can restore intestinal barrier integrity.

3) The third mechanism is the effect of probiotic bacteria on inflammatory markers and cytokines. Oxidative stress and inflammation influence the development and subsequent progression of CKD. The microbial derived uremic toxin indoxyl sulfate exacerbates reactive oxygen species production and inflammation in 3T3-L1 adipose cells. Probiotics have the potential to modulate and regulate the immune response. Probiotic bacteria lower levels of proinflammatory markers like IL-1β, IL-6, C reactive protein (CRP) and TNFα and up regulate levels of anti-inflammatory markers like IL-10.

**REFERENCES**


