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P321 -The efficacy of oral probiotic, prebiotic and synbiotic supplementation in modulating gut derived circulatory toxic particles associated with mortality in dialysis patients: a systematic review and meta-analysis of randomised controlled trials

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Introduction

Chronic systemic inflammation is a non-traditional CV risk factor that is present and perpetual in dialysis patients and is associated with increased morbidity and mortality. There is accumulating evidence that the changes to the microbiota may play a role in this. Investigations into the potential of prebiotic, probiotic or syn-biotic interventions in dialysis patients have been performed, but there is currently no systematic review and meta-analysis that has synthesised the effect on circulating toxic and inflammatory metabolites. Therefore, the aim of this systematic review is to assess the efficacy of pre- pro- or syn-biotic oral supplementation in reducing circulating endotoxin, p-cresyl, indoxyl sulphate, markers of inflammation and lipid profiles in end stage renal disease patients receiving haemodialysis or peritoneal dialysis.

Methods

Fifteen electronic databases of published data, non-published data and registered trials were searched alongside internet and hand searches. Eligibility criteria were randomised controlled trials, of adult end stage renal-disease patients receiving either haemodialysis or peritoneal dialysis. Studies were restricted to those which had administered a pre- pro- or syn-biotic as an oral supplement and included a concurrent control group receiving a placebo. Primary outcomes were circulating endotoxin, p-cresyl and indoxyl sulphate. Secondary outcome measures were circulating C-reactive protein (CRP), Interleukin-6 (IL-6), total cholesterol, high and low density lipoproteins (HDL and LDL), and triglycerides.

Results

Fourteen trials were eligible (619 randomised patients), of which 12 trials were considered to have a high risk of bias. Three trials provided data for meta analyses that indicated oral supplementation of pre- pro- or syn-biotics significantly reduced circulating levels of p-cresyl (standardised mean difference, SMD -0.55, 95% confidence interval -1.01 to -0.09, P=0.02). For endotoxin and indoxyl sulphate there was an insufficient number of trials (n=1 for each) to perform meta-analyses. These studies individually reported a statistically significant reduction in endotoxin (P=0.007), but no change in indoxyl sulphate (P>0.05). Supplementation did not significantly change circulating total cholesterol (SMD 0.10, -0.34 to 0.54, P=0.66), or triglyceride (SMD -0.15, -0.47 to 0.16, P=0.35), LDL (SMD 0.23, -0.16 to 0.63, P=0.25). Supplementation significantly increased circulating IL-6 (SMD 0.43, 0.01 to 0.85, P=0.04). For CRP and HDL there was large statistical heterogeneity between studies (I2=62% and I2=82% respectively), therefore a meta-analysis was deemed inappropriate.

Discussion

This systematic review and meta-analysis provides evidence that pre- pro- or synbiotic oral supplementation in dialysis patients may be effective in reducing mortality and cardiovascular disease through modulation of circulating factors.