

Effect of Lactobacillus Rhamnosus on Serum Uremic Toxins (Phenol and P-cresol) in Hemodialysis Patients

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Introduction and Objectives

Uremic toxins such as p-cresol and phenol are suggested to be associated with higher mortality in hemodialysis patients. The aim of this study was to investigate the effects of probiotics on serum p-cresol level in hemodialysis patients.

Methods

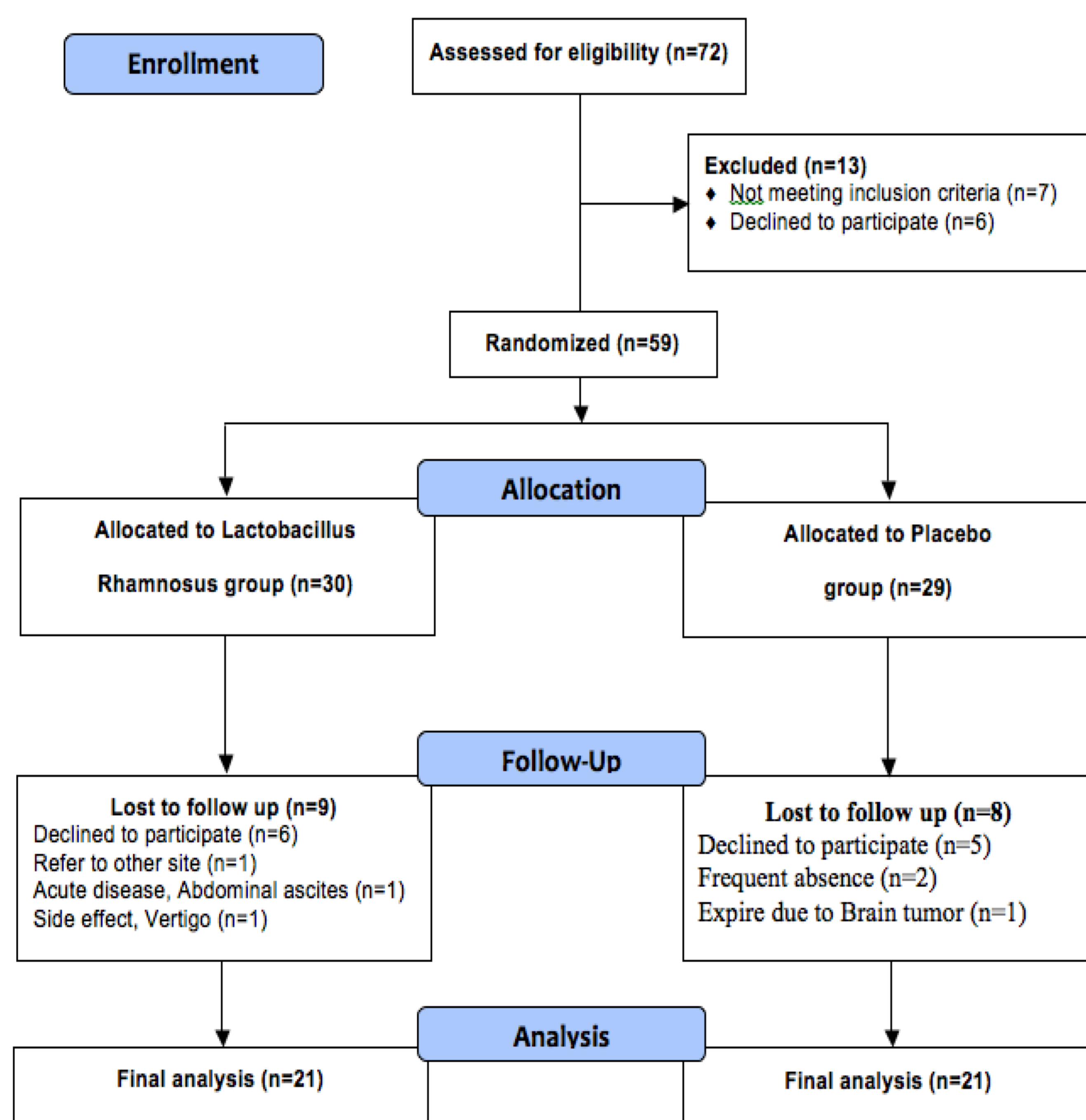
- * Patients undergoing hemodialysis in Shahid Labbafinezhad Hospital - Shahid Beheshti University of Medical Sciences were enrolled in this Randomized Controlled Double Blind Clinical trial (Clinicaltrials.gov IRCT20154182017N21). The patients received probiotic (Lactobacillus Rhamnosus) for duration of 4 weeks.
- * All data were presented as the mean \pm SD. Statistical analyses were performed by SPSS statistical software. Paired t-test was used to compare pre- and post-treatment p-cresol levels. P values less than 0.05 were considered statistically significant.

Results

- * A total of 42 hemodialysis patients (32 male and 10 female) were enrolled in this study. The mean \pm SD age of the patients in Lactobacillus Rhamnosus and placebo groups were 57.05 ± 13.96 and 59.67 ± 15.04 years, respectively. Values of uremic toxins before treatment did not differ statistically between groups but they were significantly lower in Lactobacillus Rhamnosus group compared with placebo group ($P < 0.05$). Total Phenol and p-cresol levels was associated with sodium, energy, carbohydrate, fat and protein intake and fiber consumption, accompanying by hemodialysis hours per week in linear regression analyses.

Conclusion

- * This study demonstrated that probiotics can be a promising target in hemodialysis patients with the capability of decreasing serum phenolic uremic toxins in this population.



Serum Uremic toxins (mg/dl)	Study Groups		Mean Diff. (95% CI) p-value	
	Lactobacillus Rhamnosus (n=21)	Placebo (n=21)		
Phenol	Baseline (Before intervention)	2.10 \pm 2.04	2.29 \pm 1.46	0.18 (-0.93, 1.30) .739 ^a
	After intervention	1.01 \pm 0.76	1.85 \pm 1.27	0.84 (0.18, 1.50) .014 ^b
	Mean Diff. (95% CI) p-value	-1.09 (-1.88, -0.31) .009 ^a	-0.44 (-1.27, 0.39) .285 ^a	0.79 (0.10, 1.48) .024 ^c
P-cresol	Baseline (Before intervention)	2.68 \pm 2.70	2.42 \pm 1.54	-0.257 (-1.67, 1.15) .713 ^b
	After intervention	1.23 \pm 1.04	2.48 \pm 2.18	1.24 (0.15, 2.32) .026 ^b
	Mean Diff. (95% CI) p-value	-1.40 (-2.4468, -0.11) .034 ^a	0.05 (-0.94, 1.05) .913 ^a	1.57 (0.53, 2.61) .004 ^c

^a Paired sample t-test (Within group)

^b Independent sample t-test (Between groups)

^c Analysis of covariance (ANCOVA) test, adjusted for history of Hemodialysis, Protein consumption and Fiber intake