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A DESCRIPTIVE STUDY ON THE USE OF PROBIOTICS AND PREBIOTICS FOR KIDNEY STONES MANAGEMENT

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Abstract:

Introduction: *Nephrolithiasis is a complex disease influenced by genetic and environmental factors. Twin studies have revealed a 56% heritability risk for stones while other implicated factors include diet, exercise, work environment and geography.*

Objectives of the study: *The main objective of the study is to analyze the use of probiotics for the management of kidney stone in local population of Pakistan.*

Methodology of the study: *This descriptive study was conducted at Bahawal Victoria Hospital, Bahawalpur during March 2018 to November 2018 with the permission of ethical committee of hospital. The data was collected from 100 patients who were suffering from kidney stone. We prepare a questionnaire survey based on the knowledge and use of probiotics in local population of Pakistan. After that we ask the patients for the use of probiotics in daily life as it is considered to be the natural remedy for kidney stone.*

Results: *The data was collected from 100 kidney stone patients. The mean age of the patients were 45±5.56 years. The oxalate tolerance by the human beings and other mammals are often regularly encouraged by the presence of oxalate-degrading microorganisms in their intestinal microbiota. One of the first oxalate degrading intestinal microbes to be characterized was* Oxalobacter formigenes *as it requires oxalate as a carbon and energy source. In addition ~18 other probiotics have been screened to degrade oxalate but do not require oxalate for its growth.*

Conclusion: *It is concluded that some evidence has supported the use of prebiotics, probiotics, or symbiotic, especially for the treatment of diarrhea, their use in other disease states is controversial. The probiotics supplements are now broadly used as nutraceuticals and as health supplements.*

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INTRODUCTION:

Nephrolithiasis is a complex disease influenced by genetic and environmental factors. Twin studies have revealed a 56% heritability risk for stones while other implicated factors include diet, exercise, work environment and geography. In recent years, the role of the intestinal microbiome in influencing the composition of the urine has been explored resulting in data suggesting that it affects kidney stone incidence [1]. The discovery of probiotics came about in the early 20th century, when Elie Metchnikoff, known as the "Father of Probiotics" had observed that rural dwellers in Bulgaria lived to very old ages despite extreme poverty and harsh climate. Crystals of calcium oxalate are the most widely recognized kind of kidney stones [2]. Kidney stones are dense masses that form in the kidney when there are increased levels of calcium, oxalate, cystine, or phosphate and very less liquid [3]. Calcium oxalate stones are triggered by too much oxalate in the urine. Oxalate is considered an unusable end product of mammalian metabolism and urinary oxalate is derived from endogenous metabolic sources, primarily produced by the liver. Almost 80-90% of kidney stone forming individuals form calcium oxalate stones and hyperoxaluria is a main risk factor in this kidney stone diseases [4].

One possible approach to prevent renal stone recurrence is to decrease the consumption of oxalate rich foods. However, albeit such dietary limitation has been accounted to decrease stone recurrence, its long term effectiveness is uncertain. Therefore, other methods aimed to reduce intestinal oxalate absorption have been sought [5]. Both epithelial barriers of the intestine and kidney mediate oxalate balance. Several investigations acknowledged that intestinal commensal bacteria with oxalate degrading activity have the potential to contribute to oxalate homeostasis. Studies have demonstrated that rehashed use of antibiotics can result in the loss of naturally occurring oxalate-degrading bacteria. With this loss, dietary and endogenous oxalate turns out to be more bioavailable both to the mammalian host and intestinal microbiota. The oxalate tolerance by the human beings and other mammals are often regularly encouraged by the presence of oxalate-degrading microorganisms in their intestinal microbiota [6].

Objectives of the study

The main objective of the study is to analyze the use of probiotics for the management of kidney stone in local population of Pakistan.

Methodology of the study

This descriptive study was conducted at Bahawal Victoria Hospital, Bahawalpur during March 2018 to November 2018 with the permission of ethical committee of hospital. The data was collected from 100 patients who were suffering from kidney stone. We prepare a questionnaire survey based on the knowledge and use of probiotics in local population of Pakistan. After that we ask the patients for the use of probiotics in daily life as it is considered to be the natural remedy for kidney stone.

Statistical analysis

The data were collected and analyzed through SPSS (Version 21.0). All the values were expressed in mean and standard deviation.

RESULTS:

The data was collected from 100 kidney stone patients. The mean age of the patients were 45±5.56 years. The oxalate tolerance by the human beings and other mammals are often regularly encouraged by the presence of oxalate-degrading microorganisms in their intestinal microbiota. One of the first oxalate degrading intestinal microbes to be characterized was Oxalobacter formigenes as it requires oxalate as a carbon and energy source. In addition ~18 other probiotics have been screened to degrade oxalate but do not require oxalate for its growth. After performing analysis we found the most useful probiotics for the management of kidney stone are as follows which we represent in table 01.

Table 01: Some of the commercially available prebiotics and probiotics

	Trade Name	Strain(s)	Dose
Probiotics	Acidophilus Pearls	Lactobacillus acidophilus and Bifidobacterium longum	1 × 109 CFU
	Align	Bifidobacterium infantis 35624	1 × 109 CFU
	Children's Theralac	Lactobacillus acidophilus LA-1	1 × 1010 CFU
		Bifidobacterium lactis BL-34	1 × 1010 CFU
		Bifidobacterium lactis Bi-07	3 × 109 CFU
		Lactobacillus paracasei F-19	1 × 109 CFU
		Lactobacillus rhamnosus LR-44	1 × 109 CFU
	Living Flora	Lactobacillus acidophilus	8 × 108 CFU
		Bifidobacterium bifidum	8 × 108 CFU
		Lactobacillus plantarum	1 × 108 CFU
		Lactobacillus helveticus	1 × 108 CFU
		Lactobacillus salivarius	1 × 108 CFU
		Streptococcus thermophilus	1 × 108 CFU
	Multi-Flora ABF	Bifidobacterium longum	5 × 109 CFU
		Lactobacillus acidophilus	
	Culturelle	Lactobacillus GG	1 × 1010 cells
	Actiflora	Lactic acid bacteria	45 billion viable bacteria
	Nutricolony	Saccharomyces boulardii	450 mg
	Florastor Maximum Strength	Saccharomyces boulardii lyo	250 mg
Prebiotics	Syntol Prebiotic Blend	Fructo-oligosaccharides	500 mg

DISCUSSION:

The use of prebiotics, probiotics, and synbiotics is gradually gaining acceptance in the medical community. There have been multiple claims that they are beneficial in the prevention and treatment of different renal conditions [7]. Unfortunately, clinical evidence to support the safety and efficacy of these supplements is often sparse. An area that is highly researched in regard to probiotics is diarrhea, and several randomized controlled trials have explored the treatment and prevention of acute gastroenteritis (AGE) in children. Meta-analyses of these trials

suggested beneficial effect of probiotics in the early treatment of acute viral watery diarrhea in children. Several different strains of probiotics have also been shown to reduce the risk of antibiotic-associated diarrhea (ADD) in children [8].

The urine of most humans is supersaturated and favors CaOx crystallization. Thus, perhaps it is not surprising that 70% or more of kidney stones are composed of CaOx. Given that the urine of most persons is supersaturated for CaOx, one might indeed wonder why everyone does not form stones. However, although supersaturation is key and requisite for stone formation, other biologic events are also implicated [9]. These include the formation of anchored precursors within the kidney including Randall's plaque and collecting duct plugs, macromolecules that control the rates of crystal growth and aggregation, and crystal internalization and processing by cells. These secondary factors are only partially understood, and not subject to therapeutic interventions at the present time [10].

CONCLUSION:

It is concluded that some evidence has supported the use of prebiotics, probiotics, or synbiotics, especially for the treatment of diarrhea, their use in other disease states is controversial. The probiotics supplements are now broadly used as nutraceuticals and as health supplements. Accessible probiotics seems to be safe but should be avoided for the patients those are at high risk of septicemia and other clinical complications.

REFERENCES:

1. Liebman M, Al-Wahsh IA (2011) Probiotics and other key determinants of dietary oxalate absorption. Adv Nutr 2: 254-260.
2. Anbazhagan K, Sasikumar P, Gomathi S, Priya HP, Selvam GS (2013) In vitro degradation of oxalate by recombinant Lactobacillus plantarum expressing heterologous oxalate decarboxylase. J Appl Microbiol 115: 880-887.
3. Sidhu H, Allison MJ, Chow JM, Clark A, Peck AB (2001) Rapid reversal of hyperoxaluria in a rat model after probiotic administration of Oxalobacter formigenes. J Urol 166: 1487-1491.
4. Hatch M, Cornelius J, Allison M, Sidhu H, Peck A, et al. (2006) Oxalobacter spp. reduces urinary oxalate excretion by promoting enteric oxalate secretion. Kidney Int 69: 691-698.
5. Campieri C, Campieri M, Bertuzzi V, Swennen E, Matteuzzi D, et al. (2001) Reduction of oxaluria after an oral course of lactic acid bacteria at high concentration. Kidney Int 6: 1097-1105.
6. Lieske JC, Tremaine WJ, De Simone C, O'Connor HM, Li X, et al. (2010) Diet, but not oral probiotics, effectively reduces urinary oxalate excretion and calcium oxalate super saturation. Kidney Int 78: 1178-1185.
7. Lieske JC (2017) Probiotics for prevention of urinary stones. Ann Transl Med 5: 29.
8. Tamime AY, Saarela M, Korslund SA, Mistry VV, Shah N (2005) Production and maintenance of viability probiotics micro-organism in dairy products: pp 39-72.
9. Kosin B, Rakshit SK (2006) Microbial and processing criteria for production of probiotics: A review. Food Technol Biotechnol 44: 371-379.
10. Korbekandi H, Mortazavian AM, Iravani S (2011) Technology and stability of probiotic in fermented milks containing probiotics and prebiotics. Nova Science Publishers, USA