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Homeopathic perspective of environmental factors in stone diseases: a mini review

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ABSTRACT

Homeopathy is based on the claim that illnesses can be treated using substances that produce similar symptoms. Mostly, these have been heavily diluted in water or alcohol so that none or only a few molecules of the active ingredient are present. Kidney stone disease is a crystal concretion formed usually within the kidneys. It is an increasing urological disorder of human health, affecting about 12% of the world population. It has been associated with an increased risk of end-stage renal failure. The etiology of kidney stone is multifactorial. The most common type of kidney stone is calcium oxalate formed at Randall's plaque on the renal papillary surfaces. The mechanism of stone formation is a complex process which results from several physicochemical events including supersaturation, nucleation, growth, aggregation, and retention of urinary stone constituents within tubular cells. These steps are modulated by an imbalance between factors that promote or inhibit urinary crystallization. It is also noted that cellular injury promotes retention of particles on renal papillary surfaces. This article is an endeavor to explain its adequacy dependent on later methodical surveys on kidney stones. Electronic databases were looked for orderly audits/investigation regarding the matter. Forty-one articles satisfied the consideration/rejection criteria. It is concluded that the best environmental clinical evidence for homeopathic medicines available up to date and permit positive endorsements for its use in clinical practice.

Keywords: Homeopathy, Kidney stones, Calcium oxalate, Urolithiasis, Renal calculi

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INTRODUCTION

The Pathophysiology of Urolithiasis is closely associated with environment. Homeopathy system of medicine states that the diseases are the result of Vital force's reaction to combination of genetic and environmental factors i.e., the internal and external environment [1]. The harmonious functioning of the internal environment and the Physical, biological and psycho-social components of external environment [2] have an impact on the Vital force which is balanced in health. The prevalence of urolithiasis varies by age, sex, race and geography. The incidence of Urolithiasis is affected by several conditions like obesity, gout, Diabetes mellitus and other risk factors like diet and environmental factors. Urolithiasis being a systemic disorder, is influenced by constitutional reaction to the environment. Homeopathic constitutional treatment based on individualistic and holistic approach based on Law of Similia will convert the constitutional dyscrasia and the stone disease may be controlled.

BACKGROUND OF THE STUDY

The environmental factors associated with urolithiasis involved in different ways. Calcium oxalate stone formation are Genetic factors: primary hyperoxaluria, disorders of glyoxalate metabolism (Type I / II), secondary hyperoxaluria, due to fat malabsorption syndromes, such as gastric bypass surgery, inflammatory bowel disease, chronic pancreatitis, ethylene glycol poisoning, diet rich in oxalate and Vitamin C. Calcium phosphate stone formation are Sarcoidosis, renal tubular acidosis, bone disease or fracture, immobilization, milk-alkali syndrome, medullary sponge kidney, Primary hyper parathyroidism and Medications like Topiramate, Calcium supplements, Carbonic anhydrase inhibitor and

Vitamin D. Cystine stone formation is genetic defect in the transport of cystine. Struvite stone formation is patient with urinary tract infection (UTI). Uric acid stone formation is primary gout, increase purine intake in diet, glycogen storage disorders; G6PD deficiency, increased phospho-ribosyl pyro-phosphate synthetase activity, hypoxanthine-guanine phosphoribosyl transferase deficiency (Lesch-Nyhan syndrome), neoplastic diseases, polycythemia, haemoglobinopathies and psoriasis. Small bowel disease leading to ileostomy [3]. Family History is a non-dietary risk factor. The risk of stone formation is 2.5% higher in individual with Family history. This may be a result of combination of genetic predisposition with environmental exposure. Physical activity, hot work environment [4], body mass, gender, age, ethnicity, geographic location are the environmental factors contributing to stone formation.

Age and Sex

Renal calculi disease is found to be prevalent among the age group of 30-60 years [5]. In another study, the working population of North India between the age of 20-40 years were found to be the high-risk group [6]. It was reported that the younger ones have tendency to form calcium phosphate stones and older people have tendency to form uric acid stones [7]. Stone formation in Paediatric age group is related mainly to the metabolic disorders [8]. Costa-Bauzá A.*et al.*, in 2007, concluded that the Calcium oxalate dihydrate stones and Uric acid stones were predominant among men; Hydroxyapatite calculi were more common among women. The prevalence of Calcium oxalate dihydrate stones and Hydroxyapatite calculi decreased with age whereas that of Uric acid stone and calcium oxalate monohydrate stones increased with age in both sexes [9]. This may be related to the slightly higher range of normal calcium level in men than that of Women [10]. Multivariate analysis also indicated that male gender was the only independent predictor of stone related mechanisms [11]. Females suffer more from Phosphate and Calcium oxalate stones, on the other hand males suffer more from Uric acid and magnesium stones [12]. The risk of Kidney stone is higher in the Post-menopausal period, those who have undergone Oophorectomy and those with low estrogen level [5].

Geography

The high incidence of renal calculi in some countries may be related to global warming, climate, diet, mineral contents in the water in the particular zone. The exposure to amplified ultraviolet radiation leads to increased production of Vitamin D3 and protracted exposure to sunlight increases excretion of calcium and oxalate which in turn leads to stone formation [5].

Ethnicity

Fredunlich, E. *et al.*, in 1982 found that there is very high frequency in Oriental Jewish children, as well as in Arab children, and is rare in Jewish children of Ashkenazic European origin [13]. In later studies of adult population there was higher incidence of Renal calculi in the Arabs, West Indians and Latin Americans whereas European, East Asian and African population had less incidence [14].

Body Mass Index

Obesity increases the risk in both men and women due to dehydration resulting from increased body fats (hydrophobic nature). Higher Body Mass Index (BMI) increases the incidence of renal calculi [12-15].

Physical activity

Physical activity irrespective of intensity [16] can reduce the risk of renal stone formation. Physical activity modifies the usage of vitamins and minerals that are involved in renal stone formation especially that of sodium. Physical activity leads to decreased sodium excretion in urine, increased fluid intake, and thereby decreases the sympathetic tone which all together reduces the risk of stone formation [15]. The physical activity evidently reduces the risk of Uric acid stones [12] but moderate physical activity without compensatory fluid intake increases the risk of uric acid and calcium oxalate renal calculi formation [19]. Occupation also has impact on occurrence of Kidney stones, the Professionals are more prone to stones diseases than blue collar workers [5].

Systemic Diseases

Primary hyperparathyroidism [18], Gout, Diabetes mellitus, Chronic inflammatory bowel disease leads to hypercalcaemia, hypercalciuria, hyperoxaluria, etc., resulting in Kidney stone formation [4].

Diet

The rising incidence of renal calculi is related to the altered dietary pattern with low fibre and low fluid intake, high sugar (fructose), unrefined carbohydrates sodium, fats and animal protein consumption[5, 12]; intake of Purine, Ascorbic acid & Oxalate rich food (like tomatoes, nuts, green beans, chocolates, tea)[5]and alcoholism [17]. High energy diet (i.e., >2200 kcal/d) increases the risk [15]. Vitamin A decreases the risk of stone formation whereas Vitamin D increases the risk of stone formation [18]. Phytate (cereals and legumes) decreases the risk of calculi. Fluid intake has a positive role in reducing the risk of all types of calculi except Uric acid calculi [12].

Dietary factors and their mechanism in increasing the risk of Calcium oxalate stone formation includes [3].

- Dietary Oxalate by increasing the urinary oxalate excretion.
- Dietary Sodium and Carbohydrate by increasing the urinary calcium excretion.
- Animal protein by increasing urinary calcium and uric acid excretion &by reducing urinary citrate excretion.
- Vitamin C increases oxalate generation and excretion and thereby increases the risk of calcium oxalate stone formation.

Dietary factors and their mechanism in decreasing the risk of Calcium oxalate stone formation includes [3].

- Calcium by decreasing the binding of dietary oxalate in gut.
- Potassium rich food - increases urinary citrate excretion and reduces urinary calcium excretion
- Phytate inhibits calcium oxalate crystal formation
- Dietary Magnesium reduces dietary oxalate absorption and inhibits calcium oxalate crystal formation.
- Deficiency of Vitamin B6 increases oxalate production and result in oxaluria.

Pathophysiologic risk factors and interventions for Kidney stones [3]

The risk of low urine volume in case of Calcium stones can be intervened by adequate fluid intake; salt and protein restriction can reduce the risk of hypercalciuria whereas oxalate restriction for Hyperoxaluria, Protein restriction for hyperuricosuria. High urine pH is also a risk factor that plays a major role in Calcium stone formation. The protein restriction may reduce the risk of low urine pH and Hyperuricosuria in case of Uric acid stones and fluid intake reduces the risk of low urine volume. The risk of Cystinuria in case of cystine stones can be intervened by Methionine and salt restriction; whereas the risk of low urine volume via fluid intake and low urine pH by protein restriction.

Remedies Frequently Used for Renal Calculi in Homoeopathy

Berberis vulgaris, Terebinthina, Sarsaparilla , Acidum Phosphoricum, Nux vomica , Oxalic acid, Lycopodium clavatum, Cannabis sativa, Gelsemium, Aconitum napellus, Cantharis vesicatoria, Natrum carbonicum, Podophyllum, Mercurius, Occimumcannum, Calcarea carbonica, Sepia officinalis, Arnica montana, Opium, Alumina, Argentum nitric, Asparagus, Belladonna, Benzoic acid, Carbo animalis, Cinchona officinalis, Eryngiummaquat, Ipomoea, Nitric acid, Pareriabrava, Tabaccum, Uvaursi, Arsenicum album, Apismellifica, Digitalis, Plumbum metallicum, Phosphorous, Calcareaaurinaria, Pulsatillanigricans, Zincummetallicum, Medorrhinum, Dioscoreavillosa, Equisetum. The homoeopathy hypothesizes that Vital force is the source of phenomena of life and the sphere in which disease begins and medicines acts. The Pathophysiology of Urolithiasis is not confined to the urinary tract alone, but extends beyond to the internal and external constitution. As the multifactorial causation of Urolithiasis necessitates a wholistic approach, which is mandatory for effective management of renal calculi. The review of the studies on Homoeopathic management of renal calculi shows in Table 1.

Table 1. Literature outcome of selected articles related to stone diseases.

Sl. No	Year	Number of Participants	Constitution/ Temperament / Specific medicine	Nature of Study	Medicine & Potency	Size of Stone	Result/Outcome	Remarks
							Expelled / Dissolved / Reduced with Time taken	
1.	2018 [20]	3	Temperamental	-	Lycopodium, Sulphur, Phosphorous, Kali Sulph, Natrummur, Nux vomica, Belladonna, Calcarea carb		All cases with renal calculi showed improvement within 3-5 months.	Medicine prescribed based on temperamental analysis was effective in controlling the disease.
2.	2018 [21]	5	Constitution and specific medicine	-	Lycopodium and Sarsaparilla	Largest- 12mm	Constitution medicine followed by a organ specific remedies give positive results effectively in renal calculi. 4 cases were cured in 3 months 1 case was cured in 9 months	Though Lycopodium clavatum and Sarsaparilla are considered for right sided complaints, they are also effective in removing left sided calculi.
3.	2019 [22]	30	Symptom totality	-	Lycopodium	-	60% of cases were cured and 33% of cases showed improvement	Lycopodium can help patients with renal calculi to live a life in ease without surgical intervention.
4.	2018 [23]	1	Constitutional	-	Lycopodium clavatum 0/1 to 0/6	12x 6 mm ²	The stone was expelled in 3 months	Lycopodium clavatum is effective in removing even large sized stone without surgery.
5.	2019 [24]	4	Constitutional	-	Phosphorous, Lycopodium, Nux vomica			Well selected individualised constitutional remedy reduces the suffering of renal calculi patient more effectively
6.	2019 [25]	105	Constitutional Vs Predetermined medicine	-	Constitutional and Predetermined medicine were used.	-	Size reduced in 42 cases and expelled in 26 cases within 3 months.	Individualised Homoeopathic medicines more effective than predetermined medicines like Epigearapens and Uvaursi
7.	2018 [26]	10	Constitutional	-	Berberis vulgaris	5 to 7 mm	Expelled in 6 months	Individualised Homoeopathic

		4			Thujaoccidentalis	7 to 12.6mm	Expelled	medicine can be considered as an effective alternative, non invasive treatment option.
		1			Lycopodium clavatum	23mm	Expelled	
		1			Sarsaparilla	16mm	Size reduced to 9.4mm	
8.	2013 [27]			Animal model study - Male Wistar rats	Berberis vulgaris 200C	<ul style="list-style-type: none"> • Normal level of Stone forming constituents • Prevention of Renal damage. 		Ultra high diluted Berberis vulgaris has strong anti-urolithiasis potential.
9.	2014 [28]			Rat model	Berberis vulgaris 200C	<ul style="list-style-type: none"> • Increase in activity of enzymatic and non - enzymatic anti-oxidants 		Homeopathic preparation of Berberis vulgaris acts as a protective remedy for kidney by alleviating the oxidative stress in association with renal calculi.
10.	2015 [29]			Experimental Study	Berberis vulgaris Φ, 6C, 30C, and 200C	<ul style="list-style-type: none"> • Berberis vulgaris is very potent against nucleation and aggregation in the process of CaOx crystallization 		Berberis vulgaris in appropriate concentration is effective against the early events of crystallization of CaOx
11.	2019 [30]	1	Constitutional	-	Lycopodium 0/1 to 0/4	7.4 mm	Cured in 2 months	Homoeopathic medicines when prescribed for urinary calculi based on constitutional symptoms produce best effects
		1	Constitutional		Phosphorus 1M	6 mm	Cured in 2 months	
12.	2011[31]	311	Symptom totality	-	Lycopodium clavatum, Sulphur, Pulsatillanigricans, Nux vomica, Cantharis vesicatoria, Berberis Vulgaris, Belladonna, Argentum met, Sepia, Natriummuriaticum,	220 cases showed marked improvement: <ul style="list-style-type: none"> • In 106 cases –The calculi were completely expelled • In 114 cases - The size of calculi has been reduced. 		Lycopodium clavatum, Sulphur, Pulsatillanigricans, Nux vomica, Cantharis vesicatoria were found to be effective in dissolution or expulsion of the calculi

					Colocynth, Stramonium, Calcarea carb, Mag Phos, etc.			
13.	2008[32]	1	Symptom totality		Sarsaparilla 30C	7 mm	Stone expelled during urination.	Homoeopathic medicines play a great role in expulsion of the calculi without any surgical intervention
14.	2013[33]	1	Characteristic Keynote symptom		Lyssinum LM	11mm	Stone was expelled in urine within 8 days when prescribed on basis of History of Dog bite	Characteristic or Keynote symptom plays a major role in selection of the Similimum.
15.	2011[34]	1	Constitutional(individualised)		Nux Vomica 30C	16 mm & 9mm	Both stones were expelled while voiding urine.	Individualised Homoeopathic prescription can effectively expel the kidney stones.
16.	2015[35]	1	Constitutional(individualised)		Phosphorus 30C & 200 C	12 mm	Stone expelled within a month	Homoeopathic medicine after individualization can expel even large calculi more efficiently.
17.	2012[36]	206	Constitutional(individualised)				In 128 cases stones were complete dissolution In 52 cases stone size reduced.	Homoeopathy plays a major role in management of renal calculi.
18.	2017[37]	1	Constitutional		Berberis Vulgaris 30C	12.6 × 6.3 mm	Stone – Expelled while urinating in 3 months	Homoeopathy is effective in removal renal calculi and the stone expelled revealed the presence of Sulphur and Silicon along with O, Ca, Mg, Pd & Au
19.	2018 [38]	1			Hydrangea arborescence & Berberis vulgaris 3X	0.66mm	Stone expelled within 1 month but measured about 18 × 9 mm.	The author points out that the size of the stone did not increase as such but it is the same stone that has turned

								flattened, soft and elongated in shape and justifies the effect of Hydrangea arborescence
20.	2010 [39]	90	Symptom totality		Lycopodium clavatum	3mm to 5mm and above	In 43 cases – calculi was expelled in 12 months. Size reduced in 9 cases, size increased in 3 cases and 35 cases were statues que.	This study proves the effectiveness of Lycopodium clavatum in treatment of Renal calculi.
21.	2019 [40]	134	Lycopodium Vs Placebo		Lycopodium clavatum		The stone was expelled in only 19% of cases.	In this study Lycopodium clavatum did not show any significant action like expulsion/dissolution of the renal calculi in comparison with placebo.
22.	2018 [41]	1	Specific		Hydrangea arborescens 30	8 mm	Stone dissolved in 3 months.	It is evident that Homoeopathic organospecific medicines are also equally effective in treating renal calculi when prescribed on symptom similarity when compared to individualized / constitutional medicines

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