EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 6
Issue: 13
50-52
Year: 2019

EPIDEMIOLOGY OF UROLITHIASIS IN CENTRAL SRI LANKA

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Article Received on 29/09/2019 **Article Revised on 19/10/2019** **Article Accepted on 09/11/2019**

ABSTRACT
Introduction: Urothiasis is a highly prevalent condition with a high recurrence rate that has a large impact on the quality of life of affected people and the health economy of the country. The aim of this study is to analyze the epidemiological data of patients presented with urolithiasis during past 10 years to teaching hospital Peradeniya. **Materials and Methods:** This was a descriptive study conducted among patients presented with urolithiasis during past 10 years at surgical unit, Teaching hospital, Peradeniya. Interview based questionnaire was performed with 452 patients to assess their epidemiological data. Questionnaire was based on the epidemiology of the patients. **Results**: The mean age of the study sample of 452 participants was 42.83± 13.75 years and mean body mass index was 24.57±3.73 kgm^{-2}. There was a significant relationship of comorbidities (diabetes mellitus, hypertension, ischemic heart disease with incidence of urolithiasis (p= 0.001) and significant correlation with age (p= 0.01). p values for sex, family history, ethnicity were p= 0.001, p= 0.4, p= 0.82 respectively. **Conclusions**: Majority of the respondents with urolithiasis is likely to increase with age and comorbidities.

KEYWORDS: Urolithiasis, Age, Sex, Occupation, Family history, Comorbidities, Sri Lanka.

INTRODUCTION
Urolithiasis is a very common cause for acute abdominal pain in presenting to surgical casualties. Usually patients present with acute onset agonizing pain in the flank, which is colicky in nature and radiates to the groin region.[1,2]

Sri Lanka is a developing country situated in the 'Afro-Asian stone-forming belt' (which stretches from Sudan, the Arab Republic of Egypt, Saudi Arabia, the United Arab Emirates, the Islamic Republic of Iran, Pakistan, India, Myanmar, Thailand, and Indonesia to the Philippines) but, the research regarding epidemiology of urolithiasis is rare.[3]

This study is based on the epidemiological data collected for 10 years from 2009 -2019 in Teaching Hospital Peradeniya, Sri Lanka. The aim of this study is to analyze the epidemiological data of patients presented with urolithiasis. Since most of the risk factors for urinary stone formation are epidemiological factors including age, gender, ethnic and familial background, climate and environment, lifestyle and dietary habits, occupation and education level.[4]

MATERIALS AND METHODS
Methodology
This was a descriptive study conducted among patients presented with urolithiasis during past 10 years at surgical unit, Teaching hospital, Peradeniya. Interview based questionnaire was performed with 452 patients to assess their epidemiological data. Questionnaire was designed to collect the epidemiological data of the patients.

Statistical analysis
Correlation and chi square test were performed to discover whether there is a relationship between variables. Statistical significance at $p< 0.05$ was accepted for all analysis. Data was analysed using Statistical Package for the Social Sciences (SPSS) version 20.

RESULTS AND DISCUSSION
In total, 452 respondents the mean age was 42.83 ± 13.75 years and mean body mass index was 24.57 ± 3.73kgm^{-2}.

Table 1: Characteristics of the study sample.

Characteristics		Percentages of the study sample (%)	Statistics in Central province
Gender	Male	77.8%	47.91%
	Female	22.2%	52.08%
Ethnicity	Sinhala	77.8%	66%
	Tamil	2.8%	23.8%
	Muslim	3.7%	9.9%

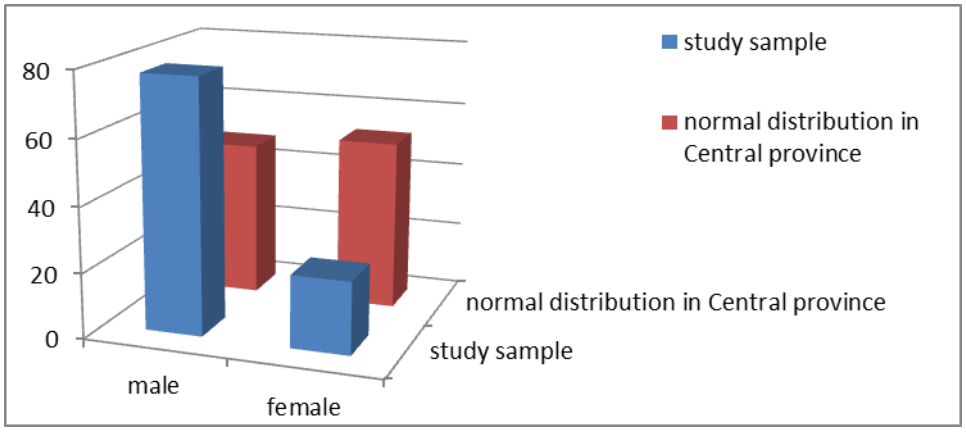

Figure 1: Gender distribution in Central province and study sample.

Epidemiological data of previous studies has shown a favorable relationship between healthy eating habits and regular physical activity level and a lower risk for Urolithiasis or progression of it.[5]

In our study, there was a significant relationship of comorbidities (diabetes mellitus, hypertension, ischemic heart disease with incidence of urolithiasis (p= 0.001) and significant correlation with age (p= 0.01). Furthermore the tables given below describe the significant association of sex and occupation, but not with ethnicity and family history.

Table 2: Relationship between Sex and Urolithiasis.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	473.023[a]	4	0.001
Likelihood Ratio	419.943	4	0.001
N of Valid Cases	452		

Based on statistics, between 120 and 140 per 1000,000 will develop urinary stones each year with a male/female ratio of 3:1.[6]

Table 3: Relationship between Ethnicity and Urolithiasis.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.488[a]	4	0.829
Likelihood Ratio	2.635	4	0.621
N of Valid Cases	452		

Table 4: Relationship between Family history and Urolithiasis.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.037[a]	4	0.401
Likelihood Ratio	5.459	4	0.243
N of Valid Cases	289		

Table 5: Presence of urolithiasis in different occupational categories.

	Occupation categories	% in general population	% in study population
Sri Lanka Labor Force Survey Annual Report – 2014 by Department of census and statistics.	Senior officials and managers	4.5	**1.6**
	Professionals	6.4	**5.2**
	Technicians and Associate profession	5.9	**2.5**
	Clerks	4.3	**1.9**
	Sales and service workers and proprietors	11.8	**26.6**
	Skilled Agricultural and fishery workers	20.2	**2.5**
	Craft and related workers	17.2	**0.8**
	Plant and machine operators and assemblers	8.3	**1.6**
	Elementary occupations	20.9	**15.8**
	Armed forces occupations	0.4	**4.7**
	Unemployed		**36.38**

According to world literature, the prevalence of nephrolithiasis is ranging from 7 - 13% in North America, 5–9% in Europe, and 1–5% in Asia.[4] But according to recent studies done in Asia, the prevalence of urolithiasis in Asia has increased by about 1%-19.1%. It is even higher as 5%-19.1% in West Asia, Southeast Asia and South Asia.[7] This increase in prevalence can be due to changes in climate, dietary habits and genetic factors. And also, it can be changed because of technological advances and easy accessibility and the availability of advanced healthcare with high-tech imaging diagnostic technologies (ultrasonography and /or computed tomography). The reason for these differences among regions can be due to the risk factors like age, gender, dietary habits, fluid intake, climate, occupation and education level, socio-economic status, racial or national distribution, genetic and metabolic disease, season of the year and climate.[7,8,9,10]

CONCLUSIONS

Patients presenting with urolithiasis are likely to increase with age, sex, comorbidities and there was a significant difference of the incidence of urolithiasis among different categories of occupation. New studies should be done over larger samples in different cultural and different geographical areas.

ACKNOWLEDGEMENT

All subjects who participated in this study and staff members of surgical unit, Teaching Hospital, Peradeniya, Sri Lanka who supported in data collection.

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