

**OCCUPATIONAL DISTRIBUTION OF UROLITHIASIS
IN CENTRAL SRI LANKA.**

Part-1 (MEDICAL SCIENCE)

Chapter-I

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ABSTRACT

Urolithiasis is the third most common urological disease affecting both males and females. Factors which are affected to predispose to sporadic urolithiasis include dietetic issues, occupation, geographic and climatic aspects as well as the special characteristics of drinking water. The study sample size of this descriptive cross sectional study was 184. Both male and female patients were included under the age group of 20 to 70 who have done same occupations for more than two years were enrolled in this study. Patient's demographic details, blood and urine investigations, X-ray Kidney, Ureter, Bladder (KUB) and ultra sound KUB data were recorded. The association between the percentages of colic and the occupational category was calculated. Then it was compared with the occupational distribution of general Sri Lankan population. The objective of this study was to evaluate the pattern of occupational distribution of patients presenting with urolithiasis. As the results, mean age of the subjects were 40.86 ± 11.99 and out of the sample 72.82% (n=134) were male and 27.17% (n=50) were female. Population of patients with colic, there were 24.14% patients who did sedentary occupations whereas in general population the percentage was 32.9%. Population of patients with colic, there were 76.48% patients who did non-sedentary occupations whereas in general population the percentage was 71.30%. Therefore Urolithiasis was prevalent among non-sedentary occupants than sedentary occupants.

Index Items :

Urolithiasis,
Blood and urine investigations,
X-ray KUB,
Occupational category,
Sedentary,
Non-sedentary

I. INTRODUCTION

Urolithiasis is the third most common urological disease affecting both males and females. It is predominant among males in a proportion of approximately 2:1^(vi) However, the exact rate differs between studies done by different authors. Most of the studies reporting that approximately three males are afflicted for every female.^(viii) It is probably due to lifestyle changes in males (working activity, type of diet, fluid consumption and etc.) which have made them more prone to urolithiasis than female. Both genetic and environmental factors contribute to stone formation. Factors believed to predispose to sporadic urolithiasis include dietetic issues, occupation, geographic and climatic aspects as well as the special characteristics of drinking water.^(vi,vii) In the past, studies had proved that occupation plays no relevant part of stone formation and there was no difference in those involved in active occupations^(ix) On the other hand, in recent years it was fairly well established that certain occupations have a high incidence of urinary tract stone disease. The prevalence of stone disease and the risk of developing stone disease is increase in occupations where individuals are chronically exposed to a hot environment and a massive sweating was high.^(ix) Also people engaged in less active occupations had a greater predisposition to stone disease. As an example, medical profession has high incident of stones disease^(ix) The stressful events are also considers as risk factors for stone formation. Some authors have been found that obesity and stress are among the most common life style related health problem.^(ix)

According to the surveys of urolithiasis done by the Japanese Urological Association have shown that 5.4% of the general population can be expected to suffer from urolithiasis at least once in their life.⁽ⁱ⁾ Many reports state that sedentary workers, administrative workers, outdoor workers, and professional and managerial groups have a high incident of stone formation^(ii,iii) In one study, only administrative workers had a high prevalence (19.6%), and the rates for the other occupational groups were nearly equal. Most administrative workers belong to higher social classes and have more money at their disposal which they spend on foods and hence they become obese. Moreover, they usually eat dinner at a late hour and have occupational stress. Hence, it becomes difficult to assess whether occupation itself is a primary factor in stone disease or whether it merely establishes other environmental factors.^(iv) The objective of this study was to evaluate the pattern of occupational distribution of patients presenting with urolithiasis.

II. MATERIALS AND METHOD

This was a descriptive cross sectional study. The study population consisted of patients who were referred to the genitourinary clinic, Teaching Hospital Peradeniya. The sample size was 184. Both male and female patients were

studied under the age group of 20 to 70 (mean age 40.86 ±11.99) during a ten month period (01.05.2015 to 25.01.2016) by using systematic random sampling method. The patients who have done same occupations for more than two years were enrolled in this study. Patient's demographic details, blood and urine investigations, X-ray Kidney, Ureter, Bladder (KUB) and ultra sound KUB data were recorded. Patients with metabolic aetiologies such as hypercalcemia, hyperparathyroidism and etc. were excluded. Data were entered and evaluated using the statistical package for social sciences (SPSS) with one way ANOVA.

The occupation of each individual was categorized according to standard international classification of occupations. The employed population by occupation category in general Sri Lankan population was obtained by annual publication of 'Sri Lanka - Labour Force Survey Annual Report - 2014' by Census and Statistics Department of Sri Lanka.

Table 01- Occupational categories in general Sri Lankan population and their percentages

SL.No.	Occupational category	% in general population
1	Managers, senior officials and legislators	4.5
2	Professionals	6.4
3	Technicians and associate professionals	5.9
4	Clerks and clerical support workers	4.3
5	Service and sales workers	11.8
6	Skilled agricultural, forestry and fishery workers	20.2
7	Craft and related trade workers	17.2
8	Plant and machine operators, and assemblers	8.3
9	Elementary occupations	20.9
10	Armed forces occupations	0.4
Total		100

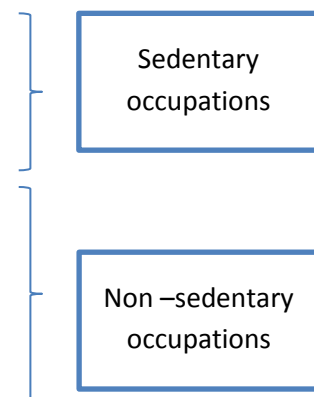
The association between the percentages of colic and the occupational category was calculated. Then it was compared with the occupational distribution of general Sri Lankan population.

III. RESULTS

A total of 184 participants (aged 20-75 years) were included in this analysis. Mean age of the subjects were 40.86 ±11.99 and out of the sample 72.82% (n=134) were male and 27.17% (n=50) were female.

Table 02- Distribution of occupational categories in general Sri Lankan population and colic population

SL. No.	Occupational category	% in general population	% in colic population
1	Managers, senior officials and legislators	4.50	1.10
2	Professionals	6.40	3.85
3	Technicians and associate professionals	5.90	1.64
4	Clerks and clerical support workers	4.30	1.10
5	Service and sales workers	11.80	16.45
6	Skilled agricultural, forestry and fishery workers	20.20	0.55
7	Craft and related trade workers	17.20	10.00
8	Plant and machine operators, and assemblers	8.30	17.03
9	Elementary occupations	20.90	26.92
10	Armed forces occupations	0.40	12.64
11	Non occupational	4.30	9.34
Total		100	100



Population of patients with colic, there were 24.14% patients who did sedentary occupations whereas in general population the percentage was 32.9%.

Population of patients with colic, there were 76.48% patients who did non-sedentary occupations whereas in general population the percentage was 71.30%.

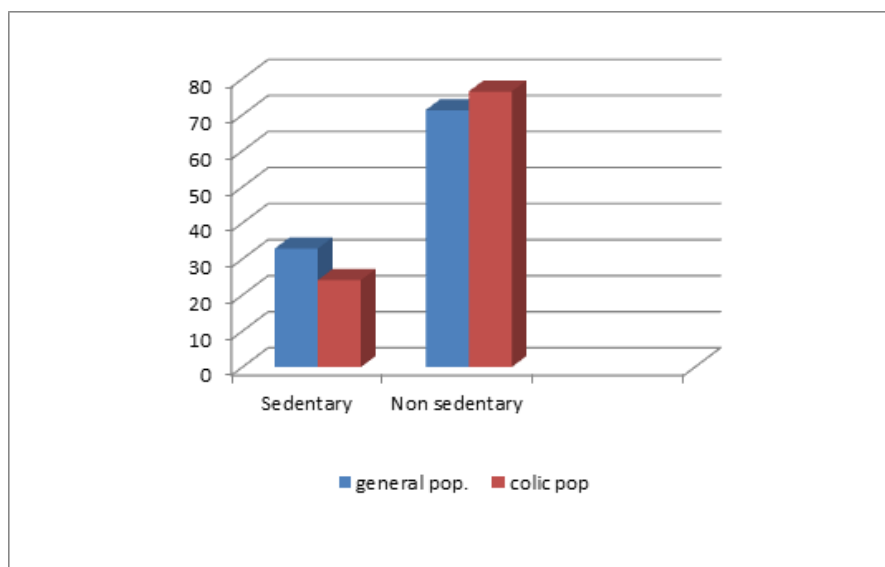


Figure 01-The graph of percentage of subjects in colic and general population

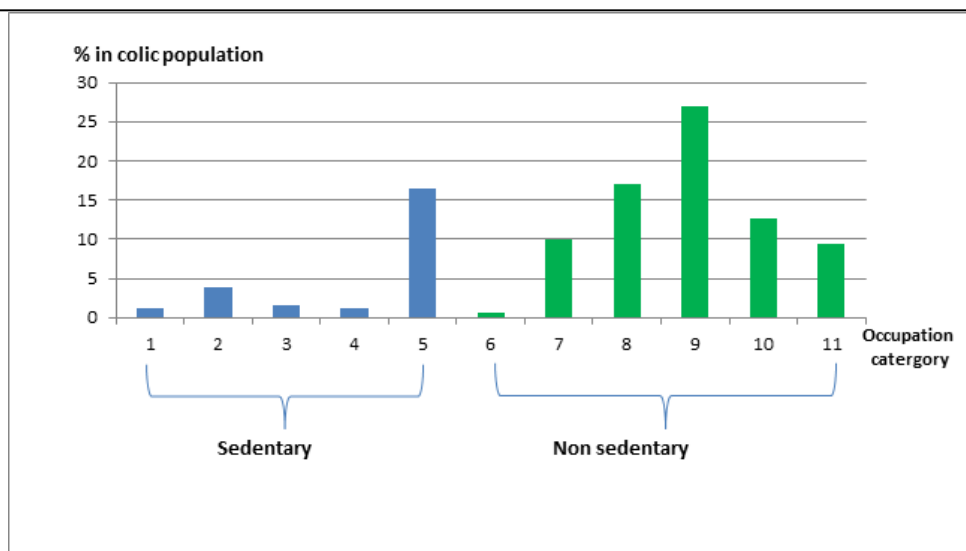


Figure02-The graph of the number of percentage of colic population with respect to the occupation category

IV. DISCUSSION

According to one of the study which was done to assess the relative distribution of occupations of the male inhabitants from 20 to 59 years old, there was no difference between stone formers and non-stone formers in occupational status, except that the administrative category was twice as common in the stone formers. ^(i, ii)

As our study 6.40% of professionals in general population and their percentage in colic population were 3.85%. This finding also have proved by another literature which was said that occupationally less active people had also a greater predisposition to stone disease. As an example, medical profession has high incident of stones disease ^(ix) Professionals were sedentary, white collar occupants who have high amount of monthly income. Therefore their monthly expenditure on food was very high. However, the monthly expenditure on food by the families of stone formers was significantly greater than that by the families of non-stone formers. ⁽ⁱ⁾ Obesity and stress are the most common life style related health problem among sedentary life style. Moreover, they usually eat dinner at a late hour and have occupational stress. It may also causes for the stone formation in sedentary occupants. ^(ix)

According to the observed results, employers who were doing non-sedentary type occupations present in higher percentage of urinary tract stones compared to the employers who were doing sedentary type occupations. Population of patients with colic, there were 76.48% patients who did non-sedentary occupations whereas in general population the percentage was 71.30% It may be due to the poor knowledge and lower education level of non-sedentary employees who were often reluctant to seek medical care for their symptoms. The utilization of stone clinics, detailed metabolic evaluations, and meticulous follow-up of recurrent stone formers has led to a greater understanding and knowledge of treatment options. ^(xii)

Most of the male patients of our research were mesons, farmers, drivers, labors and soldiers. All of these occupations are non-sedentary types. Hence they are hard workers and less educated people. Due to less water consumption and swatting, urine concentrated in kidneys and urinary calculi can be formed. Infections may also a risk factor for genesis of stones. ^(x) and where industrial hazards occur, stone disease became a major problem. The urine becomes concentrated with stone-forming salts such as Calcium, Oxalate and Phosphate. ^(xiii) When these ions supersaturated, can precipitate out of solution into crystals that can either be expelled with voided urine or grow an aggregate under the relative influences of various stone-promoting or stone-inhibiting agents, resulting in stone formation. ⁽¹¹⁾ There were 26.92% of colic population was elementary occupants such as labors, farmers and machinists. Their prevalence of exposure for chemical hazards was high. Machinists also exposed to a hot environment and a massive sweating was high. ^(ix) As a result of dehydration, they have high prevalence for urolithiasis.

The following measures are to be best suitable preventive measures in the management of urolithiasis. Increase uptake of water up to 2L daily, maximizing the urinary output, limiting the use of drugs that induce uroliths, minimizing the intake of animal protein, low intake of sodium, lowering the dietary intake of purine and oxalate rich food, limitation of dietary intake of calcium and monitoring the body weight gain. ^(ix)

V. CONCLUSION

Urolithiasis was prevalent among non-sedentary occupants than sedentary occupants.

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