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Awareness of Association between Fluid Intake and Renal Calculi among Medical Students.

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ABSTRACT

The aim of this survey is to look for the awareness of association between fluid intake and renal calculi among medical students.

Introduction: The most common problems among various urological disorder is renal stone. Renal calculi occurs in 1 in 20 people at sometimes in their lives proper functioning of every system in the body depends upon daily water intake. Water, the lifeline carries nutrients to the cells, removes toxins of vital organs and provides a moist environment for various organs such as ear, nose & throat. Due to reduced urine volume or increased excretion of stone forming components such as calcium, oxalate, urate, cysteine, xanthine and phosphate leading to development of renal stones.

Materials and methods: A study was carried out among 100 medical students who were randomly selected from students in different years of MBBS batches of SLIMS, Puducherry. Each students were given 15 questions. A self administrated questionnaire was used to gather the data from each of them and necessary measures were taken to avoid discussion among them in order to avoid biased results. The results were statistically analysed.

Results:
This survey successfully highlighted that there is lack in awareness as far as adequate water consumption during the daytime is concerned. About 36% medical students drink as little as 500 ml water during their college hours. Hence, they remain dehydrated during most of their study hours and it does have significant adverse effects on their body. If this situation persists for longer period of time, it may definitely result in a number of health problems, including renal calculi. This survey also points out that nearly 50% of medical students feel less thirsty and therefore drink less water while they remain in an air-conditioned room during their lectures. There is continued insensible water loss going on while in air-conditioned room and lack of replacement of fluid results in a number of significant changes in the body metabolism.

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Conclusion: It is very important to create awareness among medical students to drink ample of water, e.g. at least 1500ml water, to prevent conditions like renal calculi. Applying this to the general population, it is equally important to bring awareness among other working sections of the society to achieve the goal.

Introduction

The most common disorders among urological diseases is renal calculus (1,2). Deposition of sediments in the kidneys gradually leads to formation of solid structures which are mainly calcium salts of oxalate, phosphate and they are called renal stones (1,3). Renal stones often do not cause any symptoms. However, most important symptom of renal stone disease is flank pain. Renal stone disease affects adult men 2-3 times more commonly than adult women. (1)

It has also got a high recurrence rate nearly 14.0% after 1 year, 25.0% -31.5% after 5 years, 49.0% -52.0% after 10 years and 72.0% after 20 years(4,5) .The prevalence of the renal disease and the type of stones varies in different countries. In India, 12% of the population is expected to have renal stones, of which 50% may end up with decreased on loss of kidney function. Recurrent renal stone formation is a common problem with all types of renal stones such as calcium salt of oxalate, urate & xanthine (6). About 80% of all renal stones are composed of calcium salts of oxalate; the others 20% have different components such as uric acid , struvite and cysteine (7). Renal stones have multi-factorial etiology , with environment and genetic factors contributing to the pathogenesis of the stones. Renal stones are highly prevalent in mountain and desert areas.

High water intake can lower long term risk of nephrolithiasis recurrence by approximately 60%. There is an inverse association between high water intake and kidney stone formation(9). Heat exposure and dehydration may be associated with certain occupations that are risk factors for renal stone formation. Several studies have prove strong association between diet and occurrence of kidney stones(10).

Epidemiologic studies from a number of countries show that the incidence of renal stones with high animal protein intake is higher in populations. Increasing the amount of fruits & vegetables in the daily diet can be very effective in preventing renal stones. Increased urinary calcium excretion & increased calcium stone formation are linked to high intake of sodium. The current area of research is the association between higher oxalate diet and stone formation among men & women. The role of carbohydrates in renal stone formation process has been shown in few studies(11). There is no strong evidence to decrease the amount of calcium intake, calcium restriction in the consumed foods is not recommended. Minimal necessary amount of calcium for adults is about 1000mg per day (12). Body mass index & renal stone formation is the very strong association. Patients with primary hyperparathyroidism make 10-20% of stones, which accounts for about 5% of calcium stone formation (13). The etiopathogenesis of renal stone disease is not fully understood, medical treatment of underlying condition, systematic metabolic evaluation and

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patient – specific modification in diet and lifestyle are effective in reducing the incidence and recurrence of renal stone (14,15).

Material And Methods

A study was carried out among 100 college students selected randomly from all years of MBBS batches. Questionnaire comprising 15 questions as a part of survey were given to each of them. The results were statistically analysed.

Survey Questionnaire:

How often do you drink water in a day during study hours?

3 times/4 times/5 times/>5 times

Do you carry your own water bottle to college every day?

Every time/Most of the time/Sometimes/Very rare

How much amount of water do you drink in a day approximately during study hour

500 ml/1000 ml/1500 ml/2000 ml

Have you ever felt dehydrated during your college hours?

Every time/Most of the time/Sometimes/Very rare

Do you feel that carrying your own drinking water bottle will help you to drink more water during the day?

Every time/Most of the time/Sometimes/Very rare

Have you ever experienced any other health problem due to lack of drinking water?

Every time/Most of the time/Sometimes/Very rare

Is drinking water available in the vicinity where most of the time is spent during lectures and other activities?

Yes/No

Do you feel less thirsty while in the air-conditioned rooms?

Every time/Most of the time/Sometimes/Very rare

Are you aware that prolonged insufficiency in water intake may lead to renal calculi?

Yes/No

Are you aware that eating very high protein diet such as non-vegetarian food also increases risk of renal calculi?

Yes/No

Are you aware that renal calculi are recurrent?

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Yes/No

Are you aware of the types of treatment available for renal calculi?

Yes/No

Are you aware that some people use certain herbal medications for prevention as well as treatment of renal calculi

Yes/No

How much water do you usually carry during long distance travel?

500 ml/1000 ml/1500 ml/2000 ml

Has the survey created awareness on the need of adequate drinking water in order to prevent renal calculi?

Yes/No

Study design:

This was a cross sectional study carried out at SLIMS, Puducherry. Study population comprised of 100 college students. The results obtained from the survey were statistically analysed.

Result

ed on the survey, data was recorded and represented in the form of graphs. Graph 1 shows that around 65% students drink less than 500ml, 20% drink 500-1000ml, 10% drink 1000-1500ml and only 5% drink more than 1500ml water during their study hours. Graph 2 shows that nearly 90% students feel less thirsty and hence, drink less water during their study hours because of staying in the air-conditioned room for most of their time. Graph 3 shows that nearly 96% of students don't ever get dehydrated while being in the air-conditioned room. Graph 4 indicates that nearly 60% of the students are aware of the benefits of drinking water and also the consequences of less water intake, where as 40% of the students are unaware of the health hazards due to less water intake. Graph 5 indicates that nearly 65% students think that the reason for drinking less water during the day is due to decreased availability of drinking water in the vicinity of their lecture halls. However, 35% still believe that it is due to lack of awareness among the students and there is a need for creating more awareness.

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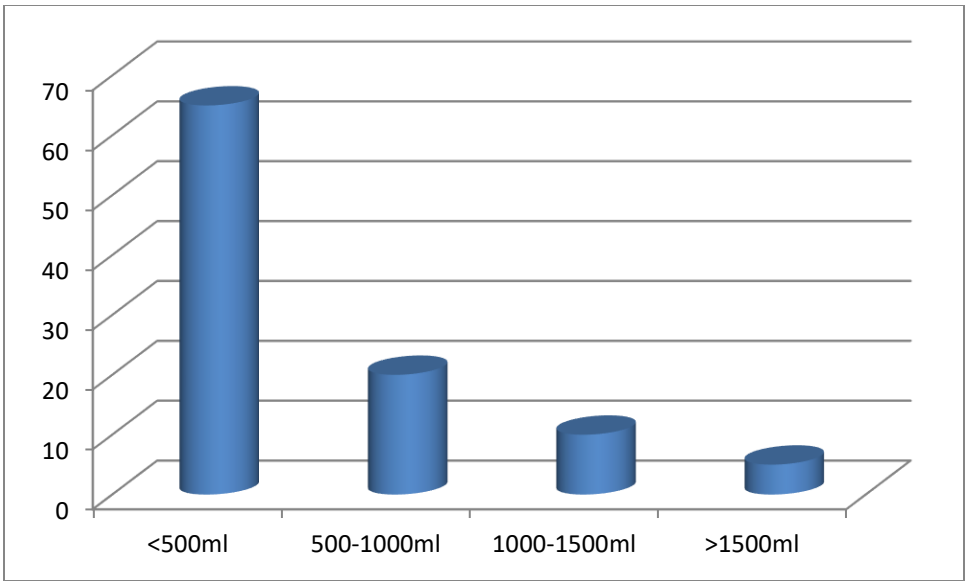
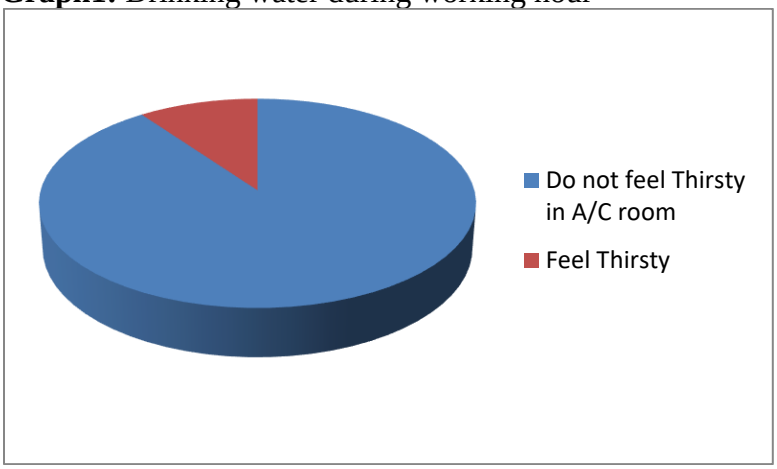
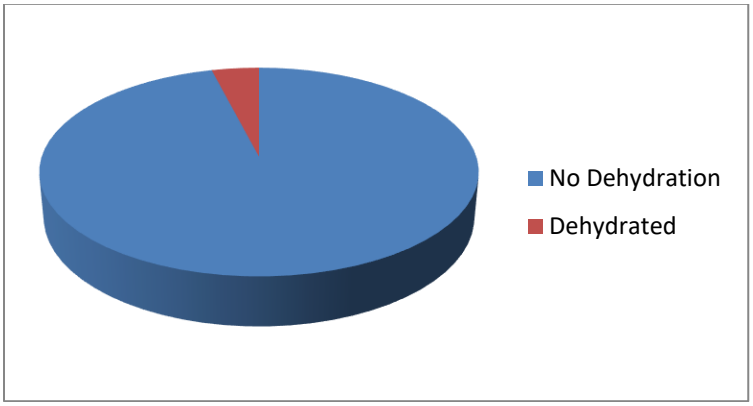


Graph1: Drinking water during working hour



Graph2: 90% students feel less thirsty and hence, drink less water during their study hours because of staying in the air-conditioned room



Graph3: 96% of students don't ever get dehydrated while being in the air-conditioned room

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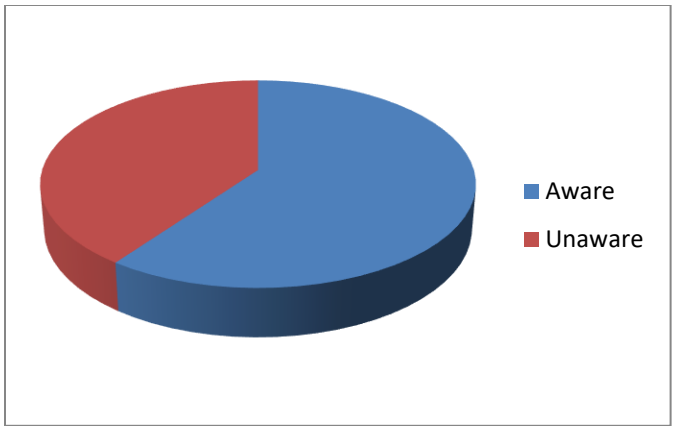
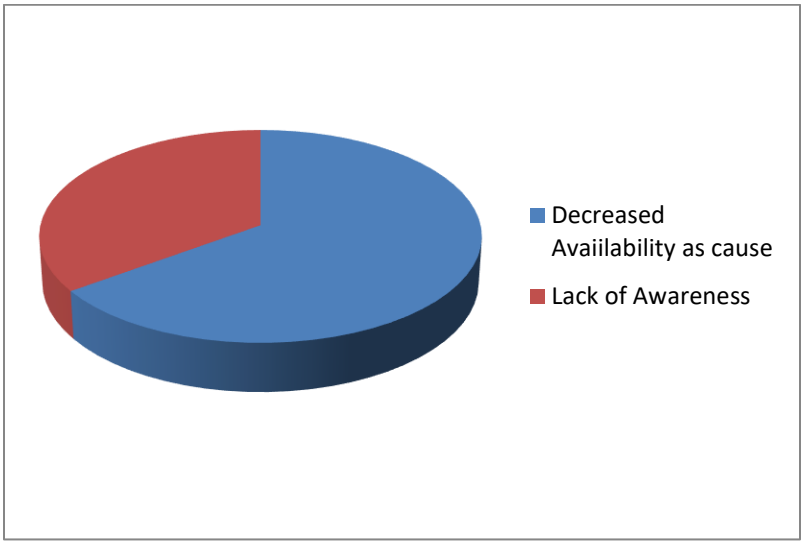


Graph4: 60% of the students are aware of the benefits of drinking water and also the consequences of less water intake, where as 40% of the students are unaware of the health hazards due to less water intake



Graph 5: 65% students think that the reason for drinking less water during the day is due to decreased availability of drinking water in the vicinity of their lecture halls. However, 35% still believe that it is due to lack of awareness among the students and there is a need for creating more awareness.

Discussion

Renal stone formation occurs due to a number of geographical, dietary and hereditary factors. At places like Tamil Nadu, where the daytime temperatures are very high during the summer, as well the relative increase in humidity contributes to increased dehydration in these areas. These places have higher incidence of symptomatic as well as asymptomatic renal calculi formation during the summer season. People with increased intake of oxalates in their food have high occurrence of oxalate stones, people with increased protein intake have uric acid stones and people with genetic preponderance have mixed stones. Though, people tend to drink more water due to heat, increased loss of fluids as in sweat results in decreased voided volumes. It tends to

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precipitate the crystals being excreted in urine forming small to medium sized stones.
Renal stones are more common in students, people in medical profession and people who work for long hours in hospital, operation theatres, schools, and colleges, where rooms are air-conditioned contributing to decreased water consumption during working hours.
In many circumstances, occupation has a major impact on the occurrence of renal stones. Renal calculi can be prevented to some extent quite easily in this population subset just by increasing the amount of water intake during daytime. Amount of water intake can be estimated by aiming at urinating around1.5 to 2 L/day. There are no specific dietary recommendations until a stone passed in the urine or obtained after surgery has been analyzed. However, diet can be modified if any crystalluria is found out. This survey does indicate the need of increasing awareness among medical students and professionals to understand the importance of adequate water intake during study or work hours to keep themselves well hydrated and thus avoid renal stones.

Conclusion

Renal stones present as an important and an easily avoidable clinical problem. This survey does indicate the need of increasing awareness among medical students and professionals to understand the importance of adequate water intake during study or work hours to keep themselves well hydrated and thus avoid renal stones.

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Conflict of interest: Nil

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