



ASSESSMENT OF NUTRITIONAL STATUS AND DIETARY PATTERN OF PATIENTS SUFFERING FROM NEPHROLITHIASIS IN DIFFERENT REGION OF PRAYAGRAJ DISTRICTS, UTTAR PRADESH

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ABSTRACT: *Changes in dietary pattern and sedentary lifestyle increases the risk of kidney stone that cause permanent damage to the kidney if not treated properly .The deposition of minerals in the kidney due to its imbalanced metabolism can led to the formation of stones in kidney, these stones vary in size and shape that can be as small as a grain of sand or as large as a pea. Whereas some stones are as big as golf balls, these can be smooth or irregular at times and are usually yellow or brown in colour. The objective of the study is to assess the food habits and daily nutrient intake of nephrolithiasis patients to assess the change in physical activity and the perceived dietary changes occurred in nephrolithiasis patients. Total 30 subjects from different areas were enrolled by random sampling from Allahabad district. Anthropometric measurements were taken for calculating BMI. Dietary intake and physical activity levels were collected by interviewing the subjects using a validated questionnaire. Mean test was applied for deducting the relevant results. The results indicate that majority of patients had excess body weight and BMI. Presence of family history of nephrolithiasis was 30%. The mean Sodium and animal Protein intake was higher than the RDA, (< 50 mmol/day) and (< 52 g/day). There was excess consumption of Fat and CHO. Calcium consumption was also deficit respectively. Sedentary lifestyle was seen in majority of women. The alarming fact was the consumption of animal protein-dense diet, high sodium intake, low in unrefined CHO, and deficit Calcium intake contributed to metabolism disorder that leds to nephrolithiasis. Lifestyle was sedentary among the few patients; hence, the emphasis is on moderate physical activity levels that accelerates the excessive sweating which causes crystallization of uric acid and calcium oxalate.*

Keywords: *Nephrolithiasis, Dietary Pattern, Animal protein, Sodium intake Physical Activity.*



INTRODUCTION:

Kidney stones affect up to 5% of the population, with a lifetime risk of passing a kidney stone of about 8-10%. Increased incidence of kidney stones in the industrialized world is associated with improved standards of living and is strongly associated with race or ethnicity and region of residence. A seasonal variation is also seen, with high urinary calcium oxalate saturation in men during summer and in women during early winter. Stones form twice as often in men as women. The peak age in men is 30 years; women have a bimodal age distribution, with peaks at 35 and 55 years. Once a kidney stone forms, the probability that a second stone will form within five to seven years is approximately 50%. Chronic kidney disease occurs when a disease or condition impairs kidney function, causing kidney damage to worsen over several months or years. Diseases and conditions that cause chronic kidney disease include: Diabetes, High blood pressure, Glomerulonephritis, (an inflammation of the kidney's filtering units glomeruli) Interstitial nephritis (an inflammation of the kidney's tubules and surrounding structures).

A precise causative factor can be family history of kidney stones (increases risk by three times), insulin resistant states, a history of hypertension, primary hyperparathyroidism, a history of gout, chronic metabolic acidosis, and surgical menopause are all associated with increased risk of kidney stones to the post-menopausal women, the chances of kidney stones is associated with a history of hypertension and a low dietary intake of magnesium and calcium. Incidence of stones is higher in patients with an anatomical abnormality of the urinary tract that may result in urinary stasis. Most patients (up to 80%) with calcium stones have one or more of the metabolic risk factors, and about 25% of stones are idiopathic in origin. Factors that may increase your risk of chronic kidney disease include: Diabetes, High blood pressure, Heart and blood vessel (cardiovascular) disease, Smoking, Obesity.

To reduce your risk of developing kidney disease one should follow instructions on over-the-counter medications, Higher dietary intake of animal protein, animal fat, and cholesterol may increase risk for micro albuminuria, a sign of kidney function decline, and generally, diets higher in fruits, vegetables, and whole grains but lower in meat and sweets may be protective against kidney function decline. This may be because sources of animal protein, animal fat, and cholesterol, and sweets are more acid-producing, prevention also includes maintaining a healthy weight, avoiding smoking, and manage medical conditions with your doctor's help.

MATERIALS AND METHODS

Research approach: Quantitative descriptive research approach was applied for the study.

Research design: The research design for the study is non-experimental descriptive design.

Settings of the study: Different areas of Allahabad district were taken respectively.

Population: Nephrolithiasis Patients falling in the age group of above 35yrs.

Sample size: 30 Nephrolithiasis Patients in the age group of above 35yrs

Sampling Technique: Systematic Random Sampling was used.



Development and description of the tool: A structured interview schedule was developed based on the objectives of the study; the questionnaire used in this study consists of three sections which are as follows:

SECTION A: Demographic data.

SECTION B: Dietary habits and daily nutrient intake.

SECTION C: Physical assessment.

Method of data collection: Data regarding the subjects' background characteristics, personal and family medical history, lifestyle habits and behaviors, and course of pregnancy were collected by face-to-face interviews. The collected data included details like age, occupational status, education level, socio economic status, Urological history, body weight, 24 hr. dietary recall and physical activity level.

Statistical techniques: Mean test was applied on following data: Age (yrs.), Heights (cms), Weight (kg), BMI (kg/m²), Medical Elevation and Daily Nutrient Intake.

Period of enquiry: This study was started in the month of September and completed in the month of October.

VARIABLES DESCRIPTION

Nutrient intake: The daily intake of Energy, Carbohydrate, Protein, Fat, and Calcium through meals was considered as dietary intake. The exchange list was used to convert the amount of consumed food in to the nutrients intake. The actual intake was then compared with the specific RDA.

Dietary recall: Dietary data was collected and analyzed using a 24-hour diet recall method. Subjects were asked to recall foods taken over the past 24 hours to assess the portion size. Data collected included information on current dietary pattern and food habits. The data from 24hr recall were analyzed and nutritive value was calculated using the exchange list.

Anthropometric measurements: Heights (m²) and weights (kg) of the individuals were recorded for calculating the BMI scores. $BMI = wt. (kg) / ht. (m^2)$

RESULTS AND DISCUSSION

Socio-Demographic Characteristics	Nephrolithiasis Patients n=30 (Mean)
Age (yrs.)	41.41
Height(cms)	155.55
Weight (kgs)	61.50
BMI (kg/m ²)	25.42
Overweight n (%)	06 (20%)



Obesity Grade I n (%)	14 (46.6%)
Obesity Grade II n (%)	05 (16.6%)
Family history of Diabetes n (%)	12 (40%)
Inflammatory bowel diseases n (%)	08 (26.6%)
Diet with high level of protein, salt, or glucose n (%)	20 (66.6%)

Table 1: Effect of Demographic Features

As shown in Table 1, the mean age of Nephrolithiasis Patients was 41.41 years, gestational age (wks.) and BMI was 25.42 kg/m². Above table clearly indicate that 20% Nephrolithiasis patients lie in the overweight category on the other hand falling in obesity category Grade I and II, were 46.6% and 16.6% respectively, following with 40% family history of type 2 diabetes, indicating that presence of family history of Type 2 diabetes is one of the risk factors for the onset of Nephrolithiasis, and the higher risk of Nephrolithiasis was due to the consumption of high level of animal protein salt and glucose i.e. by 66.6%

Nutrient	RDA		Intake	Excess / Deficit
	MALE	FEMALE		
ENERGY(kcal)	2730	2230	1958	Deficit
PROTEIN(g/d)	60	55	50	Deficit
ANIMAL PROTEIN(g/d)	56	46	62	Excess
FAT(g/d)	30	25	42	Excess
CHO	325	325	345	Excess
CALCIUM(mg/d)	600	600	550	Deficit
SODIUM(mg/d)	1500	1500	3400	Excess

Table 2: Effect of Daily Nutrient Intake

The dietary habits revealed that majority of them were non-vegetarians. Among non-vegetarians, there was preference for mutton chicken, and fish and was consumed often, Table 2 shows the daily nutrient intake and it was evaluated from the data gathered by 24-hour dietary recall. The energy intake was lower than the RDA deficit in Nephrolithiasis patients. Protein and calcium intake was also largely deficiated whereas fat and carbohydrate consumption was in excess on the other hand the excess and inconsistent consumption of animal protein and sodium was seen.



DIETARY CHANGES	YES n (%)	NO n (%)
Staying hydrated	24 (80%)	06 (20%)
Citrus drinks intake	18 (60%)	12 (40%)
Consumption of calcium (vit-D)	16 (53.3%)	14 (46.6%)
Limiting sodium intake	20 (66.6%)	10 (33.3%)
Lowering animal protein intake	18 (60%)	12 (40%)
Limiting oxalates intake	22 (73.3%)	08 (26.6%)
Avoiding phosphate (cola drinks)	25 (83.3%)	05 (16.6%)

Table 3: Perceived Dietary Changes Among Nephrolithiasis Patients

ACTIVITY	BEFORE DIAGNOSIS		AFTER DIAGNOSIS	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)
Do you have any schedule for exercise?	14 (46.6%)	16 (53.3%)	05 (16.6%)	25 (83.3%)
Do you involve in normal social activities with family, friends, neighbors or groups?	12 (40%)	18 (60%)	08 (26.6%)	22 (73.3%)
Are you doing your hobbies or recreational activities?	18 (60%)	12 (40%)	10 (33.3%)	20 (66.6%)
Do you give sufficient time for household chores?	16 (53.3%)	14 (46.6%)	06 (20%)	24 (80%)
Has your health interfered with your errands and shopping?	25 (83.3%)	05 (16.6%)	12 (40%)	18 (60%)
Do you sleep more than 8 hours?	16 (53.3%)	14 (46.6%)	24 (80%)	06 (20%)

Table 4: Physical Assessment



It is clear from the table that after diagnosing the disease majority (60%) of patients reduces the intake of animal protein but 40% still continued with the consumption animal protein. After diagnosing the Nephrolithiasis 66.6% of patients limited the consumption of sodium, 73.3% of them lowered the intake of oxalates and 83.3% of them avoided the consumption of phosphate (colas). On the other hand the patients diagnosed with Nephrolithiasis started staying hydrated by drinking water and taking citrus drinks by 80% and 60% whereas 53.3% of them increased the consumption of calcium for the treatment of Nephrolithiasis

Before diagnosing the Nephrolithiasis 46.6% patients were having schedule for exercise while after diagnosing the percentage declines to 16.6%. Similarly, majority of them were involved in social and recreational activities before diagnosing but the percentage falls as the Nephrolithiasis was diagnosed. 16% patients sleep more than 8 hours before diagnosing but after the diagnosis the percentage rises to 24%.

DISCUSSION

The overweight shown in table 1 was mainly due to the binge eating habit. The consumption of sodium glucose was high due to the consumption of processed food. If diabetes not managed properly can also led to the cause of Nephrolithiasis .The observation indicates that the obesity Grade I and Grade II in Nephrolithiasis patients was high.

Mean daily nutrient intake (Table 2) shows that the Energy intake was slightly lower than the RDA deficit in Nephrolithiasis patients. This is due to various complications which arise during Nephrolithiasis like nausea and vomiting, constipation, heart burn or gastric pressure etc. because of these problems patients do not able to take proper diet to meet the requirements. Protein intake was also largely deficit with poor intake of protein of low biological value. Fat consumption was in excess and they consumed more of saturated fat and fat from packaged, processed and ready to eat foods. Two another important nutrients Calcium and Sodium also deficit due to poor intake, lack of awareness, poor dietary habits, lack of counseling and misconception about the food consumption. There was excess consumption of CHO and CHO intake was inconsistent in meals, and exhibited intake of low unrefined CHO whereas on the other hand the consumption of animal protein was also in excess due to its frequent consumption. Findings of a study revealed that the diet of the Nephrolithiasis patients was not balanced in terms of quantity of nutrients and exhibited poor quality. The nutrient intake did not meet the RDA requirements; the consumption of CHO was excess and inconsistent in meals. Table 3 shows the dietary pattern changes that occur after diagnosing the Nephrolithiasis patients and it was seen that the consumption of water and citrus drinks and calcium were increased by 80%, 60% and 53.3% whereas on the other and the consumption of sodium, animal protein, oxalates and phosphate were lowered and limited by 66.6%, 60%, 73.3% and 83.3% Increased body weight is also associated with a higher preference for fat and other fatty foods. From the data it is clear that majority of the patients do not follow the strict dietary regime due to lack of awareness.



RECOMMENDATION

The need of education, counsel, awareness and quantity of food intake, should be practiced besides altering their dietary habits and food choices. People do not practice the recommended levels of physical activities despite the well-known benefits of it, awareness and educating the people about the benefits, of physical activities and proper dietary intake should be facilitated

CONCLUSION

The results of the present study indicate that people diagnosed with Nephrolithiasis had a higher weight and BMI. The Energy intake was slightly lower than the RDA (2207 Kcal). Animal Protein intake was higher in comparison to the intake of biological value protein which leads to the Nephrolithiasis. Fat consumption was in excess. Calcium deficit due to poor intake and other factors. This study demonstrates that people suffering with Nephrolithiasis are more sedentary during and do not have a schedule for physical activity. Majority of the patients do not follow the strict dietary regime due to lack of awareness.

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