

NEPHROLITHIASIS INCREASES RISK FOR CHRONIC KIDNEY DISEASE

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ABSTRACT: Renal calculi, the other name for nephrolithiasis, involve the formation of the crystals, which is made of salts and minerals, gets deposited into the kidneys and in general term it is known as kidney stones. This is considered to be the most common condition of the urinary system and this increases the risk of end-stage renal failure, chronic kidney disease, diabetes, hypertension and cardiovascular diseases. The objective of the study was to identify whether the kidney stone increases the risk for chronic kidney disease and what is the contribution of different variables such as gender, age, hereditary in developing kidney stones and chronic kidney disease. The study employs a descriptive survey approach and employs a non-experimental research design. The quantitative method was employed in this study. The study used a 200-person sample size. Cluster and convenience sampling strategies were used in this study. According to the findings of the study, kidney stones constitute a distinct and an independent risk factor for chronic kidney disease. The significance of the conducted study is that it will bring awareness among the healthcare professionals, healthcare institutions, government health authorities, policy decision makers to suggest the patients with kidney stones to undergo regular monitoring of the kidney function such that the onset or progression of the chronic kidney disease could be prevented at an earlier stage moreover on the other hand it will guide the researchers to conduct future studies to gather more accurate and reliable data.

Key terms: Renal calculi, chronic kidney disease (CKD), non-experimental research design, cluster and convenience sampling methods

I.INTRODUCTION:

The occurrence of renal calculi, also known as kidney stones, is produced by a disruption in the equilibrium between solubility and precipitation of salts in the urinary system and kidneys. The kidney stones and chronic kidney diseases are considered to be the major public health issue (Chaung, Hung and Li, 2020). It has been noted as well that both are related to each other. In the past, several epidemiological studies have been conducted which showed that people who already suffered with kidney stones are at increased risk of developing chronic kidney disease (CKD). The chronic kidney disease is defined as the gradual loss of the functioning of the kidney over time. As per the article published in 2017 by Dr Mohan, it is very important to take necessary precautions to avoid the formation of kidney stones as it can recur from time to time and later can cause serious

health issues therefore, one should take proper care of the kidneys to prevent the kidney stones from developing.

Few preventive measures to avoid kidney stones:

- One should stay hydrated.
- Calcium rich foods should be consumed
- Intake of sodium should be minimized
- One should avoid C supplements
- Oxalate-rich foods should be less consumed

The occurrence of kidney stone disease is growing over time among general population. In the development of kidney stones, the gender plays an important role. There are certain non-urinary factors which are associated with increased risk of development of stones in men as compared to women which are fluid intake, waist circumference, intake of sugary drinks and dietary calcium and oxalate whereas the urinary factors include pH, citrate and oxalate. Kidney damage, or infection can occur due to kidney stones as it can block the urine flow. Moreover, the kidney stones are recurrent and it can cause chronic kidney disease.

II. RESEARCH METHODOLOGY:

2.1 Research Approach: The research approach used for the study was non-experimental research design with descriptive survey approach. The non-experimental research is usually correlational or descriptive in nature.

2.2. Population and Sample: In statistics, a population is defined as a collection of identified individuals who are brought together for specific research in order to extract data from them. A sample is also described as a subset of a particular population that is chosen for the purpose of gathering, measuring, and collecting data in order to offer accurate information. The study's target population was a mixed group of people who have had kidney stones and other who never had kidney stones with a sample size of 200 persons, in order to understand relationship between the kidney stones and chronic kidney disease.

2.3. Research Tools: The sampling strategy employed in the study was cluster sampling, in which the samples were grouped together by age, gender and history of kidney stones. This is an example of probability sampling in action. The researchers divide the population into external homogeneous and internal heterogeneous groups, which are known as clusters, using this type of sampling

procedure. These clusters are grouped together based on similar qualities. This method is more practicable since the clustering of the population into homogeneous groups increases the sample's feasibility, and it also takes fewer resources for the sampling process. The convenience sampling approach was also used, in which samples were drawn from the broader population in order to provide more accurate data. This type of sampling is more convenient, cost-effective, simple, and accurate. This is the simplest form of sampling because it does not necessitate the inclusion of a specific criterion in the study.

2.4. Data Collection Method: The research was descriptive in nature. Descriptive studies are observational studies that collect data on a certain condition or phenomenon in connection to several factors such as background, location, ethnicity, gender, or time. This strategy entails the use of surveys to gather data from various people. This aided in gathering information or data from study participants in a variety of situations. Furthermore, it describes and concentrates on the cause of a given phenomenon's occurrence. The data collecting methods employed were primary data collection, in which the patient's data will be acquired through the use of questionnaires, which will aid the researchers in understanding and determining the existence of a relationship between the two. These are considered to be first-hand experience data that has never been used in previous studies. The other way is secondary data collecting, which gathers information from prior studies, financial records, and the media. This entails making use of previously collected data in order to conduct research. It is obtained for some reason by someone other than the researcher, and statistical analysis has already been completed for this type of data.

2.5 Statistical Analysis: Statistical Package for the Social Sciences (SPSS) was used to analyse the data. This will help to evaluate the qualitative data gathered with the help of the questionnaires given to the patients.

III. RESULTS AND DISCUSSION:

3.1: In recent years it has been noted that kidney stones increase the chances of developing chronic kidney disease

When the kidney stones are recurrent it can cause chronic kidney disease. Kidney damage or infection can occur due to kidney stones as it can block the urine flow. Therefore, kidney stones increase the risk of developing chronic kidney disease.

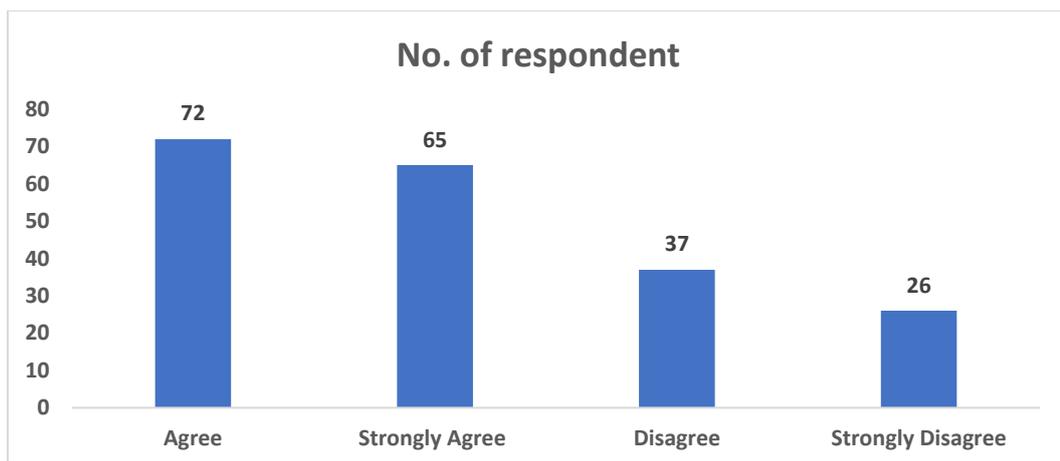


Figure 1: Kidney stones increase the chances of developing chronic kidney disease

According to this survey, 72 respondents agreed, 65 respondents strongly agreed, 37 respondents disagreed and 26 respondents strongly disagreed.

3.2 The prevalence rate of kidney stone disease is more in men as compared to women

The occurrence of kidney stone disease is growing over time among general population. In the development of kidney stones, the gender plays an important role. There are certain non-urinary factors which are associated with increased risk of development of stones in men as compared to women which are fluid intake, waist circumference, intake of sugary drinks and dietary calcium and oxalate whereas the urinary factors include pH, citrate and oxalate.

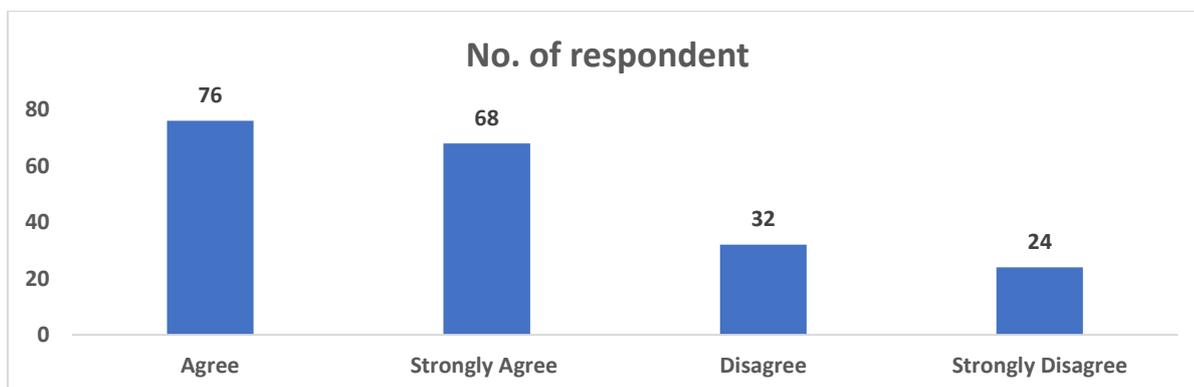


Fig 2: Men are more prone to develop kidney stone disease as compared to women

According to this survey, 76 respondents agreed, 68 respondents strongly agreed, 32 respondents disagreed and 24 respondents strongly disagreed.

3.3. Influence of genes in the development of kidney stones

Although little information is there but it has been noted family history of kidney stones contributes in the development of kidney stones when compared with people with no family history of kidney stones. Changes in the genes increase the risk of developing kidney stones.

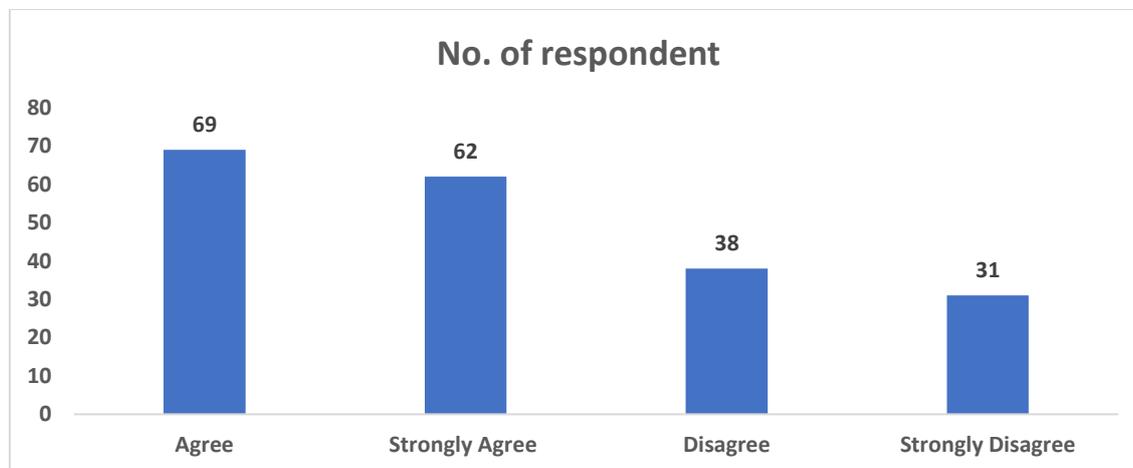


Figure 3: Genes play an important role in the development of kidney stones

According to this survey, 69 respondents agreed, 62 respondents strongly agreed, 38 respondents disagreed and 31 respondents strongly disagreed.

3.4. Kidney stone increases the rate of morbidity and infectious complications among older adults

It has been noted that the rate of morbidity and infectious complications is higher in older adults. Diseases like diabetes leads to the formation of uric acid stone at an increased rate among older population.

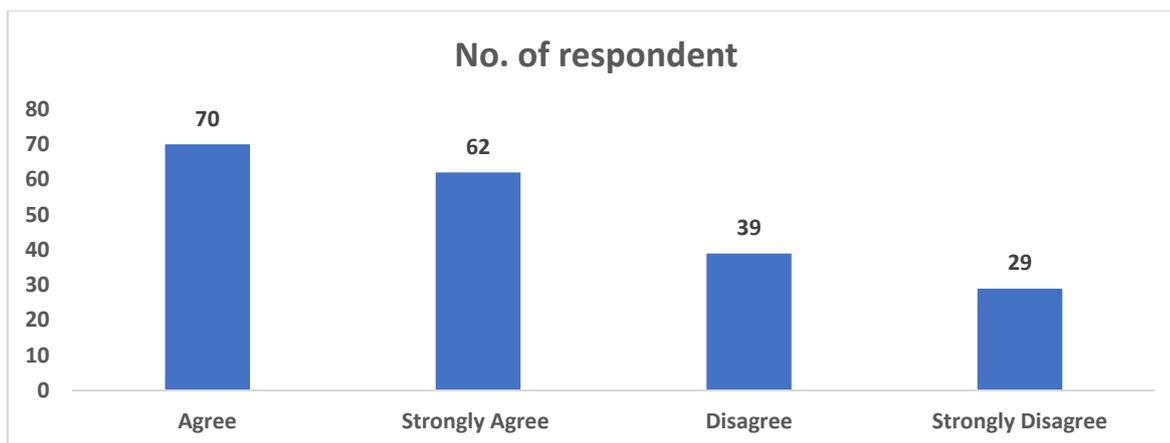


Figure 4: Thyroid disorders and kidney stones are correlated

According to this survey, 70 respondents agreed, 62 respondents strongly agreed, 39 respondents disagreed and 29 respondents strongly disagreed.

A similar recent study “Patients with kidney stones are at increased risk of developing chronic kidney disease” was conducted by Tzung-Fang Chuang et.al. in 2020 which concluded that patients with kidney stones were more prone to develop chronic kidney disease as compared to patients who developed chronic kidney disease without having history of kidney stones. This clearly states that the study conducted is in concordance with the previous study.

IV. CONCLUSION:

The aim of the study was to determine the contributing role of kidney stones in developing chronic kidney disease. According to the findings of the study, kidney stones constitute a distinct and an independent risk factor for chronic kidney disease. Therefore, it is important to educate the kidney stone patients to undergo monitoring of their kidney function at regular intervals in order to prevent or delay the progression of the disease.

V. IMPLICATIONS OF THE STUDY:

The main objective of the study was to gather data on whether there is a relationship between kidney stones and chronic kidney disease. The other significant part was to understand how different variables such as gender, age, hereditary contribute in the development of kidney stones and chronic kidney disease.

VI. RECOMMENDATIONS:

1. There is a need to gather more data on the role of genes in the development of kidney stones to understand whether stone disease is hereditary or not.

2. It is necessary to conduct more detailed research on how the chronic kidney disease can be prevented or delayed with the help of proper monitoring of the health after recovering from kidney stone disease.

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