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NEWSLETTER

SRI LANKA MEDICAL NUTRITION ASSOCIATION

No. 164, Maya Avenue, Colombo 06

Effect of food on renal stones

Urinary stone disease is a common clinical problem as the lifetime risk of having a stone is 10% in the population

What are the types of kidney stones?

Calcium stones

The most common type of kidney stone and occur in two major forms: calcium oxalate and calcium phosphate. About 80% of renal stones are calcium oxalate stones.

Uric acid stones

If uric acid becomes concentrated in the urine, it can settle and form a stone by itself or along with calcium.

Struvite stones

These are almost always the result of urinary tract infections.

Cysteine stones

Result from a genetic disorder that causes cysteine to leak through the kidneys and into the urine

Why it is important to know which type of kidney stone a person has?

The first step in preventing kidney stones is to understand their causative factors. Since diet is an important aspect of management of kidney stones, this information also helps the health care provider to suggest diet changes to prevent future kidney stones. For example, limiting oxalate in the diet may help prevent calcium oxalate stones but will do nothing to prevent uric acid stones. Some dietary recommendations may apply to more than one type of stone. Most notably, drinking enough fluids helps prevent all kinds of kidney stones by keeping urine diluted and flushing away materials that might form stones.

Diet related risk factors for renal stones formation

- **Dehydration**

  Drinking enough fluids each day is the best way to help prevent most types of kidney stones. The average daily urine output of normal healthy adults is 1.2 liters a day, ranging from 1 to 2 liters in most individuals and varying with body weight, gender, activity level, weather etc.;. In stone formers, however, a higher daily urine output is required to prevent recurrence. Achieving a daily volume of at least 2.0 to 2.5 liters a day

can significantly reduce the recurrence of future stones. People who have had cysteine stones may need to drink even more.

- **High intake of animal proteins**

  Animal protein in meat products increases the risk of stone by increasing calcium, oxalate, and uric acid levels in urine. All three of these changes increase the risk of stones. **It is recommended for the stone formers to try to reduce their meat intake .This includes all types of meat: beef, pork, poultry, and seafood.** They are also advised to choose non-meat protein foods such as nuts and beans instead of meat sources. Protein from non-meat sources does not appear to increase the risk of stones.

- **High intake of sodium**

  A high sodium intake increases the risk of stone formation by increasing calcium levels and decreasing citrate (a stone inhibitor) levels in urine.

- **Calcium**

  Despite the fact that calcium is a major component of 75% of stones, excessive calcium intake is very rarely the cause of stone formation. In fact, several studies have shown that restricting calcium intake in most stone formers actually increases the number of stones they develop. This appears to happen because when less calcium is ingested, it becomes easier for oxalate (which normally binds with calcium in the gut) to be absorbed. Higher levels of oxalate in the urine then lead to an increase in stone risk.

- **Oxalates**

  While oxalate plays an important role in the development of calcium oxalate stones, dietary restriction does not appear to be effective in reducing the risk of stones in the majority of patients. About 40% of urinary oxalate comes from dietary sources while the remainder is naturally made within the liver. Therefore, reducing oxalate dietary intake does not always have a significant impact on total urinary oxalate levels.

  Oxalate is found in many vegetable and fruits, including many healthy dietary choices often making it difficult to achieve a low oxalate diet. Stone formers should maintain a normal oxalate intake without the need for oxalate restriction. High oxalate intake should be avoided in individuals found to have high urinary oxalate levels.

Foods with very high oxalate levels

- Spinach
- Beets
- Sweet potatoes
- Wheat bran
- Chocolate
- Soya
- Pea nut

- **Refined sugars including fructose**

  A diet high in sugar can lead to formation of kidney stones, since sugar upsets the mineral relationships in the body by interfering with calcium and magnesium absorption. The consumption of unhealthy sugars and soda by children is a main reason why children as young as age five or six are now developing kidney stones.

<u>Diet related inhibitors of renal stone formation</u>

- **Adequate fluid consumption**
- **Citrates**

  Citrus juices, including lemon juice and orange juice, contain citrate, which acts as a stone inhibitor for calcium based stones. Citrate seems to do this by binding calcium, making it unavailable to combine with oxalate or phosphate: a necessary first step in the formation of stones. Citrate also seems to make it more difficult for stones to grow once they've formed

- **magnesium**

  Magnesium reduces the risk of renal stones by preventing calcium from combining with oxalate, which is the most common type of kidney stone

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