KIDNEY

1. About kidneys

Kidneys as we all have heard they are bean shaped. They are located just below the rib cage. A good functioning of every part of our body is very important to deem ourselves fit. The kidneys are very helpful in filtering the blood.,the waste and other matters are excreted as urine. So kidneys play a vital role in maintaining the health of our body. It is very important to take care of the health of Kidney. A regular check-up with the doctors will help us to prevent ourselves from kidney failure or any other problems related to kidney.

1. Why kidney is important to us!

The kidneys not only remove the waste from our body. They also remove the acid that is produced by the cells. Kidneys also play a vital role in homeostasis( *refers to stability, balance, or equilibrium within a cell or the body*). Without the help of Kidney we cannot expect our muscles, nerves to work properly.

Our kidneys play a major role in the following functions:

* · They help to maintain the overall fluid level in our body
* · Help in regulating and filtering the minerals from blood
* · Filters the waste materials from food, medications, and toxic substances
* · Produces hormones that help produce red blood cells, promote bone health, and regulate blood pressure
* · Help in the Vitamin D activation and also in the production of vital vitamins.
* · Helps in keeping the regulation of the Blood Pressure

1. Structure of Kidney

(Image)

Blood flows to the kidney through the renal arteries. The nephrons have filters. They can be called Glomerulus and tubule. The glomerulus helps to filter the blood. The tubule helps in the transportation I.e, it returns the needed substance and separates the waste.

The kidneys lie behind the peritoneum in the abdomen, on either side of the vertebral column.

They typically extend from T12 to L3. The right kidney is often situated slightly lower to the left kidney. This is due to the presence of the liver. Each kidney is approximately the length of three vertebrae.

The adrenal glands are situated immediately superior to the kidneys. They are present within a separate envelope of the renal fascia.

Kidneys are enclosed by the fats and facia.

**Renal** **fascia** – encloses the kidneys and the suprarenal. It is also known as Gerota’s fascia or perirenal fascia

**Renal** **capsule** – tough fibrous capsule.

**Perirenal** **fat** – It is a collection of extra peritoneal fat.

**Pararenal fat** – the fat that is mainly located on the posterolateral kidney.

The internal structure of a kidney is deep. The renal parenchyma is divided into two main areas – the outer **cortex** which extends to inner **medulla**, thus dividing it into triangular shapes – which are known as **renal pyramids**.

The apex of a renal pyramid is called a **renal papilla**. Each renal papilla is associated with a structure known as the **minor calyx**, which collects urine from the pyramids. Several minor calyces merge to form a **major calyx**. Urine passes through the major calyces into the **renal pelvis**, a flattened and funnel-shaped structure. From the renal pelvis, urine drains into the ureter, which transports it to the bladder for storage.

The **renal hilum** is a deep fissure that marks the medial margin of each kidney. This acts as a gateway to the kidney – normally the renal vessels and ureter enter/exit the kidney via this renal hilum. The kidneys are supplied blood through the renal artery through the renal hilum.

PREVENTION

1. Chronic kidney Disease

The chronic kidney disease is commonly known as kidney failure. It is a long term disease with most of the cases not being improved. This disease is caused by high blood pressure levels. This is the reason why blood pressure affects the function of our heart and kidney. The high blood pressure is quite dangerous to our kidneys. This is because the high blood pressure levels have the tendency to affect the glomerulus. Thi high BP might increase the pressure on glomerulus. This might affect the small vessels in it. Since the function of the glomeruli is to filter the blood, after it is affected this process might decline. This will obviously lead to the deterioration of the kidneys. To solve the problem Dialysis is a solution.

1. Urinary Tract Infection

This type of infection might range from the infection in the urinary bladder to the kidney. It infects the women more than affecting men. It can infect Urethra(urethritis) or infect the vagina( vaginitis). The most common type is the infection in the bladder which is called cystitis. The severe type is called pyelonephritis which affects the urinary tract.

If we look into the causes of the UTI it is mainly caused by the germs. The most common bacteria causing the infection is the E.Coli bacteria. Others include mycoplasma and Chlamydia. They cause problems in both men and women. The people who are affected by the infection ranges from babies to the senior citizens.

The symptoms include

· Frequent sensation of urination

· Burning sensation

· Smelly urine

· Sometimes low fever

· Irritability, feeding problems if it’s affecting babies

1. Kidney Stones

There is no specific reason in the formation of the kidney stones. They are most probably formed if there is a high level of Calcium or phosphate or oxalate in the body. They may be sometimes formed due to the medications that are followed for the treatment of Kidney cancer or HIV.

The formation of kidney stones is sometimes a hereditary disease. The **symptoms** include:

· Pain called as renal colic- happens when the stone moves into urine tract

· Nausea and vomiting

· Pain in the back below the ribs

· Pain in the groin

· Blood in Urine

· Frequent feeling of urination

· Smell in the urine

Kidney stones are rock-like crystals that are hard and are of varying sizes and shapes formed in the kidneys. There are four main types of kidney stones:

· Calcium combined with oxalate or phosphate- the most common type

· Struvite stones- caused by urine infection, horn-shaped and quite large

· Uric acid stones- softer than other forms of kidney stone

· Cystine stones- rare and hereditary. Crystalline form than being stones

The kidney stones can be **detected** using CT scans or X rays. The blood test helps to find the cause of the formation of the stone. Regular check-up as prescribed by the doctor along with the intake of medicine will help to solve the problem earlier.

There are **treatment** for kidney stones. Some of the treatment methods include

**· Extracorporeal** **Shock**-**Wave** **Lithotripsy** – Used to treat the stones that are less than 2 cm in size. The stones are broken to pieces using the ultrasound waves

**· Percutaneous** **Nephrolithotomy** – A small incision is made in your back and then a special instrument is used to remove the kidney stone.

**· Endoscope** **Removal** – An instrument is inserted into the urethra, passed into the bladder, then to where the stone is located.

**· Surgery** – This requires an incision in your back to access your kidney and ureter to remove the stone.

1. Disease prone to Kidney
   1. Glomerulonephritis
   2. Acute Kidney injury

It is the sudden damage to the kidneys that will exist only for a short time. But there are chances for the injury to remain for a longer period too. It may be different ways

· There is a chance that the injury might be totally healed and the person will have the proper functioning of Kidney

· Partial healing of the injury affecting only certain functions of kidney with no necessary for a dialysis

· Complete damage to the kidneys and in need of a dialysis

The identification of the injury involves

· Reduced levels of urine

· Increase in the toxin levels within the body

· Increasing level of creatinine

· Rapid build up of fluid level in the body

A good solution to have good health if kidney is to have a regular check up to know about the problems that we have.

* 1. Polycystic Kidney Disease

There are two types of PKD. Autosomal Dominant PKD and Autosomal Recessive PKD. In the former type of PKD, the cyst will be formed only in the Kidney. People who might be suffering from this type of disease might not get any symptoms of it until they reach the age of 30. The later type of PKD will form a cyst on both the liver and Kidney. Hence care should be taken care of both.

* 1. Lupus nephritis

The swelling of the kidney could be termed as Lupus nephritis. Because of this swelling there might be irritation caused by the lupus. There are autoimmune diseases that might sometimes affect our immune system and cause diseases. When the immune system of the kidney is also damaged then the severities caused by it are dangerous.

* 1. Kidney Cancer

Cancer is generally a genetic disease. It is not a communicable disease. So we need not fear to have a chance to be affected by cancer just by a touch of a person who is affected by cancer. The kidney cancer starts to rice from the cells of the kidneys. Kidney cancers can also be called “Renal Cell Carcinoma”.

The cells of our body keep growing. Some of the cells might be worn out or some of the cells might be damaged. So to replace these cells new cells keep growing in our body. These are often instructed by the DNA. DNA can also be called genes. So if there are any changes in the genes there is a chance for the person to be affected by Cancer. Genes are those that we obtain from our ancestors. So if there is any ancestor affected by cancer, then there is a chance for the successor to have the growth of the cancer cells in their body.

Kidney cancer is found amongst people who are more than 55 years of age. Kidney cancer is likely to affect either of the kidneys or both the kidneys. Treating them at the earliest will bring good relief to the patients. Because the tumour cells have the ability to spread to other parts of the body and damage those cells and tissues thus creating a bigger problem than the earlier.

There are two types of Kidney cancer.

The **primary** **cancer** is one in which the tumour cells do not spread to any other parts of the body. This type of cancer can also be called a localised cancer.

Secondary **Cancer** has the effect if spreading the affected cells to the other parts of the body. It could be called metastatic or advanced cancer.

One thing that is to be noted is that it is very rare for the tumour cells to spread from other parts of the body to the kidneys.

The **risk** **factors** that help in the arousal of the kidney cancers are

· Age is the major factor

· Smoking, high BP, stress

· Kidney Stones

· obesity

· long-term dialysis and acquired cystic disease

· specific genetic and hereditary conditions.

The following **symptoms** may rise in a person if he or she might be prone to kidney cancer:

· Blood in the urine

· Changes in colour of urine from light yellow to dark, rusty or brown

· Lower back, abdominal or flank pain without being affected by an injury

· Sudden weight loss

· Suddenly developed high blood pressure

· Frequent tiredness

· Fever or night sweats

The most common tests that may be ordered for the person to **diagnose** kidney cancer include:

*Ultrasound* – To look for irregularities in the kidney and other organs.

*Scans* – Computer tomography (CT) scans or magnetic resonance imaging (MRI) scans to provide detailed pictures of organs in the body.

*Chest* x-*ray* – An X-ray of organs and bones within the chest.

*Urine* test (*urinalysis*) – To detect other irregularities in the urine, such as protein.

*Blood* tests – Chemical tests of the blood to find things associated with kidney cancer.

*Intravenous* *pyelogram* (IVP) – A dye is injected into a vein and X-rays are used to map its path through the kidneys and into the urine.

*Cystoscopy* – A test to check the bladder and urethra for cancers.

*Bone* *scan* – To detect if cancer has spread to the bones.

DETECTION

1. Are you at risk?
2. Look out for these symptoms
3. Kidney health check

SUPPORT

1. Types of kidney disease
2. Treatment for kidney disease
3. Supportive Care
4. Newly diagnosed
5. Kidney transplant