

DISEASES OF THE RENAL SYSTEM

Hydronephrosis : this is a dilation of the renal pelvis and calyces, caused by accumulation of urine above an obstruction in the urinary tract. It leads to destruction of nephrons and fibrosis and atrophy of the kidney. One or both kidneys may be involved, depending on the cause and site. When there is an abnormality of the bladder or urethra, both kidneys are affected, whereas an obstruction above the bladder is more common and affects only one kidney. Urinary stasis predisposes to infection.

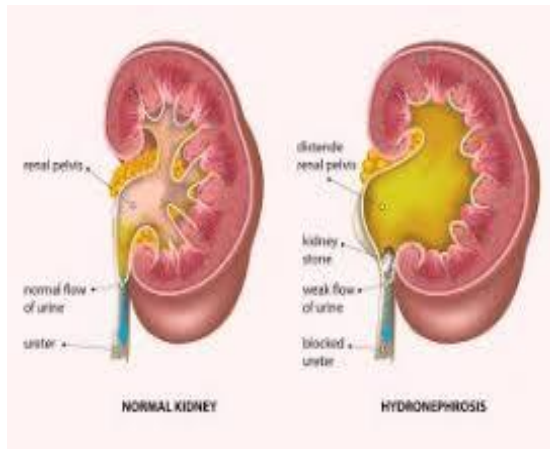
Renal calculi: calculi (stones) form in the kidneys and bladder when urinary constituents normally in solution, usually oxalate and phosphate salts, are precipitated. They are often recurrent, and are more common in males and after 30 years of age. Most originate in the collecting tubules or renal papillae. They then pass into the renal pelvis, where they may increase in size. Some become too large to pass through the ureter and may obstruct the outflow of urine causing kidney damage. Others pass to the bladder and either are excreted or increase in size and obstruct the urethra.

Chronic kidney disease : CKD is present when glomerular filtration rate has fallen to around 20% of normal. Onset is usually slow and asymptomatic, progressing irreversibly over several years. The main causes are diabetes mellitus, glomerulonephritis and hypertension. The effects on glomerular filtration rate, sodium reabsorption and tubular secretion are significant. GFR and filtrate volumes are greatly reduced and reabsorption of water is seriously impaired. This results in production of up to 10 litres of urine per day. reduced glomerular filtration leads to accumulation of waste substances in the blood, notably urea and creatinine. When renal failure becomes evident, blood urea levels are raised and this is referred to as uraemia. Some of the signs and symptoms that accompany this condition include nausea, vomiting, gastrointestinal bleeding, pruritus (itching), polyuria, acidosis, anaemia etc

End-stage renal disease : when death is likely without renal replacement therapy, such as haemodialysis, peritoneal dialysis or a kidney transplant, the condition is referred to as end-stage renal disease (ESRD). The excretory functions of the kidney are lost, acid-base balance cannot be maintained and endocrine functions of the kidney are disrupted. Towards the end of life, anorexia, nausea and very deep respiration occur as uraemia progresses. In the final stages there may be hiccoughs, itching, vomiting, muscle twitching, seizures, drowsiness and coma.

Glomerulonephritis : GN has an auto immune component, which leads to production of immune complexes that may lodge in the glomerular capillaries, causing inflammation and impairment of glomerular filtration. effects of glomerulonephritis include:

- **Haematuria** : this is painless and not accompanied by other symptoms. When microscopic, it may be found on routine urinalysis when red blood cells have passed through damaged glomeruli into the filtrate
- **Asymptomatic Proteinuria**: damaged glomeruli may allow protein to escape from the blood into the filtrate, which may be asymptomatic and found only during routine urinalysis.
- **Acute nephritis**
- **Nephrotic syndrome**



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