Hydronephrosis

This information sheet from Great Ormond Street Hospital explains the causes, symptoms and treatment of hydronephrosis and where to get help.

Hydronephrosis is a condition that can occur in the womb, where a baby's kidneys fill up with urine and become larger. This can happen for various reasons. Hydronephrosis can also occur in adults, but this usually develops for completely different reasons and is treated in a different way.

About one in every 300 people has one kidney affected by hydronephrosis. About one in every 600 people have both kidneys affected by hydronephrosis.

What causes hydronephrosis?

The urinary system consists of the kidneys, the bladder and ureters. The kidneys filter the blood to remove waste products and form urine. The urine flows from the kidneys down through the ureters to the bladder. From here it passes through another tube called the urethra to the outside when urinating.

The ureters tunnel through the wall of the bladder at an angle to form a flap that acts as a valve. There is also a ring of muscle (sphincter) at the junction of the bladder and the urethra that stops urine leaking out in between pees. When peeing, the muscles of the bladder wall squeeze the urine out of the bladder, at the same time as the muscles in the sphincter need to relax to let the urine flow down the urethra.

The valves between the ureters and the bladder prevent urine flowing backwards into the ureters, so that all the urine in the bladder is passed in one go, as the urine cannot travel anywhere else. As the urine leaves the bladder at a high pressure, the valves stop this high pressure being passed on to the kidneys.
There are many causes of hydronephrosis, including:

- A blockage, which can occur between the kidney and the ureter (pelviureteric junction or PUJ), between the bladder and the ureter (vesicoureteric junction or VUJ) or in the urethra (posterior urethral valve).
- Vesico-ureteric reflux (VUR) occurs when the valve between the ureter and the bladder does not work properly and urine can travel back up to the kidney. For more information, please see our Vesico-ureteric reflux leaflet.
- Ureteric duplication, which affects about one per cent of all people. Children with ureteric duplication have two ureters leading from a kidney to the bladder, instead of one. Occasionally, they have a blockage at the lower end of one of the two ureters called an ureterocele.

A multicystic dysplastic kidney (MCDK) is a non-functioning kidney made up of many cysts. Sometimes these shrivel up and disappear, but some need to be removed at a later stage.

**What are the signs and symptoms of hydronephrosis?**

Even if hydronephrosis is diagnosed before birth, this should not cause any symptoms in the mother and should not alter her antenatal care, other than possibly having a few more scans. Hydronephrosis does not usually cause a baby any problems before birth, but they may need close monitoring and assessment after birth to discover what is causing the hydronephrosis.

**How is hydronephrosis normally diagnosed?**

It is often diagnosed before a baby is born, as the enlarged kidneys can be seen on an ultrasound scan. Hydronephrosis can also be diagnosed after the baby is born using ultrasound scans.

**How is hydronephrosis normally treated?**

If the hydronephrosis is diagnosed during pregnancy, early treatment will consist of monitoring with ultrasound, to check that the baby is growing normally and the kidneys are not getting too large. The baby will usually be born by a routine delivery. If the hydronephrosis is causing problems for your baby, the fluid may need to be drawn off while the baby is in the womb. This is very unusual.

After the baby is born, the hydronephrosis will be monitored using ultrasound scans and other tests. The overall treatment for hydronephrosis depends on what is causing it:

- If the cause is VUR, the child will probably be treated using antibiotics.
- If the cause is a blockage, the child may need an operation called a pyeloplasty to remove it.
- If the cause is a multicystic kidney, the affected kidney will shrivel up and disappear and therefore does not need to be removed. Sometimes, if the affected kidney is very large or causing high blood pressure, it may be removed.
leaving the normal one on the opposite side. Having only one kidney will not have any significant effect on the child's health.

**What happens next?**

If the cause of the hydronephrosis is an obstruction and this is corrected, the child's kidneys will be able to work properly.

If the cause of the hydronephrosis is VUR that is not too severe, the child's kidneys are also likely to work properly. If the cause of the hydronephrosis is severe VUR, the outlook may be less good.

The child may need an operation to correct the reflux and their kidneys may be damaged. However, the earlier the hydronephrosis is discovered, the better the outcome for the child.