



Finding kidney problems before your baby is born

Most pregnant women have an ultrasound examination between the 18th and 20th weeks of pregnancy. From about 18 weeks it is often possible to detect abnormalities of the baby's kidneys or bladder. About one baby in two hundred is found to have one of these abnormalities. Other abnormalities may also be detected.

What is an ultrasound examination?

It is a painless test to examine the body organs of unborn babies using high intensity sound waves. A clear jelly is spread on the skin. A device about the size of a domestic torch is placed against the skin and moved about. Very high frequency sound (ultrasound), which can be neither heard or felt, comes from the device. Echoes of the sound reflect from the baby and his or her organs. The machine uses these echoes to create pictures of the organs. The best pictures are obtained when the mother's bladder is full.

Are all kidney abnormalities found serious?

No. Most abnormalities found are minor. The most common finding is dilation of the area in the centre of the kidney where the urine is collected. In many babies this dilation resolves before birth and in some others it gets better without treatment in the first year of life.

What will be done if an abnormality is found?

It is usually recommended that a repeat ultrasound examination be performed at about 28 weeks of pregnancy at which stage minor changes have often returned to normal. If the abnormality persists the baby will have his or her own ultrasound examination a few days after birth to determine if any further tests are required.

Won't all these ultrasound examinations hurt the baby?

The ultrasound technique has been used to examine millions of unborn babies over the past thirty years. No harmful effects have been identified using current techniques.

What serious kidney abnormalities are found?

Some examples are:

Pelviureteric junction obstruction: This is the most common serious abnormality and is due to partial blockage to the flow of urine from the kidneys. It is usually present on only one side. The other kidney is usually normal. Even this abnormality sometimes disappears during the first year or so of life as the kidney grows.

Posterior urethral valves: This abnormality causes a blockage of the urethra, the tube carrying urine away from the bladder. The bladder is shown to be distended. Investigation and surgery in the first days of life are required. It only occurs in boys.

Ureteric reflux: urine normally flows down the ureters (tubes connecting the kidneys and the bladder) into the bladder and does not reflux or travel back up the ureters to the kidneys. There is a valve-like mechanism where the ureter enters the bladder. If this valve doesn't work properly, urine can flow back up to the kidneys. Reflux only appears to increase the risk of kidney damage occurring when children also have infections, and only 3% of girls and 1% of boys will have a urine infection during childhood. Babies who have reflux but never had a urine infection are believed to be at little risk, and the reflux usually goes away as the child gets older. This is an area of intensive research.

Cysts in the kidneys: Various types of cysts occur in the kidneys. Some types are inherited. Severe forms can interfere with the function of the kidneys even in childhood.

Abnormal kidney development (renal dysplasia): It may be obvious on the ultrasound that the kidneys are small and abnormal. Rarely, one or even both kidneys may be absent. When only one kidney is present it is usually healthy, and only one healthy kidney is required for a healthy life.

However if both kidneys are absent the baby will not survive.

Can you tell anything about how well the baby's kidneys are working before birth?

Yes – partly. The amount of amniotic fluid, the “waters” around the baby, can be estimated by ultrasound. If there is a normal amount of amniotic fluid – and the kidneys are of normal size and shape, function is probably normal. If both kidneys look abnormal and there is a normal amount of amniotic fluid, there is probably enough function to sustain life. If there is a markedly reduced amount of amniotic fluid, kidney function is probably poor or absent. In extreme circumstances, examination of a specimen of amniotic fluid may provide more information.

Can these abnormalities be corrected before the baby is born?

If the bladder is severely obstructed and the function of the kidneys is getting worse, the pressure can sometimes be relieved by inserting a tube through the unborn baby's skin and into the bladder using an instrument that is passed through the mother's abdomen into the space around the baby. This can provide partial relief until the baby can be delivered safely. Unfortunately, these babies are usually born with abnormal kidneys with reduced function. This is another area of intensive research.

What sort of tests might be necessary when the baby is born?

There is usually no urgency unless there is serious obstruction to the bladder.

- Ultrasound examination during the first week
- X-rays of the bladder (cystogram): A small tube or catheter is passed into the bladder through the urethra (the tube carrying urine out of the body from the bladder) and the bladder is filled with a fluid which allows the bladder to be shown with x-rays
- Isotope scans: An isotope which is excreted by the kidney is injected into a vein. The passage of the isotope through the kidney can be tracked and precise information about the kidney function obtained. Obstruction can be shown if it is present. These doses of isotope are very tiny and very sensitive equipment is used to measure them in the body.