Acute nephritis

This information sheet explains acute nephritis in children, what causes it and how it can be treated. It also explains what to expect when your child comes to Great Ormond Street Hospital for assessment and treatment.

How does the urinary system work?

The urinary system consists of the kidneys, ureters, the bladder and urethra. The kidneys filter the blood to remove waste products and produce urine. The urine flows from the kidneys down through the ureters to the bladder, where it is stored until we go to the toilet. It passes through another tube called the urethra to the outside when urinating (peeing). The kidneys contain around a million tiny filtering units called glomeruli. As blood flows through the tubes in the glomerulus at pressure, waste products pass through the walls of the tubes to form urine. Blood cells and other things such as protein cannot pass through the walls because they are too big. The urine then passes through small tubes (tubules) where fluids, salts and minerals are removed for recycling around the body before flowing to the ureters.
What is acute nephritis?
Glomerulonephritis is the term used when the glomeruli become inflamed. This means that the blood is less able to pass through the blood vessels in the glomerulus and so the kidneys cannot make as much urine as usual. The inflammation also allows blood cells and protein to pass through the blood vessel walls in the glomerulus. Passing less urine and having protein in the urine (proteinuria) means that the body is less able to remove fluid that has been drunk.

What causes acute nephritis?
The causes of acute nephritis in children are different compared to adults. In children, it is most commonly caused by an infection, in particular, by the streptococcus bacteria. Streptococcus is usually responsible for sore throats, but can trigger a response in the body that leads to the glomeruli being damaged. Other causes in children are diseases such as systemic lupus erythematosus (SLE) and vasculitis (inflammation of the blood vessels) with the most common cause being Henoch-Schönlein Purpura (HSP). Please see our other information sheets for further details of these conditions.

What are the symptoms of acute nephritis?
The main symptom is a drop in the amount of urine that is passed, and the urine may also be red, smoky, tea- or cola-coloured because of the blood in it. The decrease in urine production can lead to puffy eyes and ankles, swelling of the abdomen, weight gain and high blood pressure. The medical word for this puffiness is oedema.

How is acute nephritis diagnosed?
Your doctor will ask you lots of questions about how your child became ill and examine your child. Various tests will be needed to confirm or rule out acute nephritis:
- Throat swabs to see if the streptococcus bacteria is present
- Urine tests to see if blood and/or protein is present in the urine
- Blood tests to check kidney function (creatinine), and to show whether waste products are being removed from the blood efficiently. Some blood tests are also taken to try to find the cause of the acute nephritis.
- A kidney biopsy may be necessary if there are signs that the kidneys are getting worse, so that we can decide if we need to give any treatment to reduce the inflammation in the kidneys.

How common is acute nephritis?
It is difficult to estimate how many children develop acute nephritis as some of them will have no noticeable symptoms and recover without lasting effects. Many children have milder forms of acute nephritis and so do not require admission or review at GOSH. However, a small number of children require additional treatment other than just observation.
How is acute nephritis treated?

The main aim of treatment is to prevent fluid overload until the filtration process settles down, as the kidneys usually get better without treatment. This means that your child will need to have his or her fluid intake restricted with a low salt diet, and may need medicines to make him or her pass more urine (diuretics such as furosemide). It may be necessary to prescribe another medicine to treat high blood pressure. If a biopsy is needed and shows that the inflammation is severe, steroids and other treatments such as plasma exchange may be necessary to reduce the inflammation in the glomeruli. For more information about steroids and plasma exchange, please see our leaflets.

Whether your child is taking steroids or immunosuppressive medicines, you may need to postpone some of your child's immunisations while taking the medicines. You should also report to your family doctor (GP) if your child comes into contact with chicken pox unless he or she has already had it. Other precautions are included in our medicines information sheets.

If the protein in the urine persists, we may also use a group of medicines called ACE (angiotensin converting enzyme) inhibitors and ARBs (angiotensin receptor blockers) to reduce the protein loss and blood pressure. For more information about ACE inhibitors, please see our information sheet. Diuretics (water tablets) are also prescribed to reduce the puffiness.

What is the outlook for children with acute nephritis?

Most children recover from an episode of acute nephritis with no lasting problems. However, we need to continue to monitor children who are left with some protein in their urine and/or high blood pressure. We need to monitor kidney function to make sure that recovery is complete and that chronic kidney disease does not develop.

Is there a support group for children with acute nephritis?

There is no specific support group, but the following organisations may be able to offer advice and support:

**British Kidney Patient Association**
Bordon GU35 9JZ
Tel: 01420 47021 or 47022
Website: www.britishkidney-pa.co.uk

If you have any questions, please call Victoria Ward on 020 7829 8815

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