ARPKD Family Information Day

Saturday, 11th July 2015
at Leeds General Infirmary

Hosted by Dr Kay Tyerman
Consultant Paediatric Nephrologist, Leeds General Infirmary

with the support of Dr Larissa Kerecuk
ARPKD RaDaR Lead, Rare Disease Lead for Birmingham Children's Hospital,
Consultant Paediatric Nephrologist

The PKD Charity

www.pkdcharity.org.uk Support line: 0300 111 1234 Email: info@pkdcharity.org.uk

Programme

09.30 – 10.00	**Coffee and Registration**	
10.00 – 10.10	**Welcome and Introductions**	*Tess Harris and Dr Larissa Kerecuk*
10.10 – 11.30	**ARPKD Basics and Genetics**	*Dr Larissa Kerecuk*
11.30 – 12.15	**The Liver in ARPKD**	*Dr Suzanne Davison, Consultant Paediatric Hepatologist*
12.15 – 12.30	**RaDaR (Rare Disease Registry)**	*Melanie Dillon*
12.30 – 13.45	**Lunch**	
13.45 – 14.05	**Workshop 1: Support Beyond The Clinic**	*Bridget Rode and Joan Kearney, Social Workers*
14.05 – 14.30	**Workshop 2: Transition**	*Dr Larissa Kerekuk*
14.30 – 14.45	**Coffee Break**	
14.45 – 15.05	**Workshop 3: Pee and Poo**	*Janet Wootton, ERIC Charity*
15.05 – 15.30	**Workshop 4: Coping Skills for Parents**	*Dr Simone Friedl, Senior Clinical Psychologist*
15:30 – 16:00	**Feedback and Close**	

What is ARPKD?

Autosomal Recessive Polycystic Kidney Disease (ARPKD) is a rare disease that affects the kidneys and liver. It is usually diagnosed in babies and young children and occurs in about one in every 20,000 live births in the UK.

How the condition affects people

ARPKD begins in early life, usually affecting babies and young children. It is a condition in which the development of the kidneys and liver is abnormal. Over time either one or other of these organs may fail. Some people have mostly kidney disease and others mostly liver problems. The reason for this variation is not known.

Patients who first show signs of the illness later in childhood tend to have a better outcome. By contrast babies who have signs of the disease before birth may have a serious illness.

Before birth

The first signs of ARPKD before birth are abnormal kidneys. These may be seen on an ultrasound scan, the first of which is generally done routinely around the 18th week of pregnancy. The kidneys may be enlarged or appear abnormally bright on an ultrasound.

In the womb, the baby is normally surrounded and protected by a watery fluid, the amniotic fluid. This fluid is made by the baby's kidneys and is in fact very dilute urine. In about a third of babies with ARPKD the kidneys do not produce enough of this fluid. This too can be seen on a scan.

Amniotic fluid is necessary for the baby to move normally. This includes breathing movements. Without the fluid the baby's lungs cannot expand and develop so that when they are born they are unable to breathe normally. Also without amniotic fluid the baby may be constricted and have abnormalities of the limbs.

Newborn babies

Some babies with ARPKD have such enlarged kidneys that the their tummy looks swollen, and the kidneys can be felt during a physical examination. An ultrasound scan may show that the kidneys contain many small fluid-filled sacks called cysts, a key feature of the diagnosis. Blood tests may show that kidney function is already low.

The baby's liver may also be enlarged. An ultrasound scan may show an abnormal liver structure and sometimes cysts. Blood tests may show that the baby's liver function is abnormal. Babies with a distended tummy may be difficult to feed as there is simply not enough space left for a full stomach.

If there was a lack of amniotic fluid during pregnancy, the baby's lungs may be small

and underdeveloped. This can result in breathing difficulties, which may mean that the baby needs help to breathe using a ventilator. In this case, the baby will need treatment in a paediatric intensive care unit. Sometimes the baby's lungs are so underdeveloped that they cannot survive even with artificial ventilation.

Children

Most patients with ARPKD develop liver and/or kidney problems during childhood. This can vary from mildly reduced function to failure of either organ.

Children with ARPKD often have excessive thirst, preferring water to food. Partly because of this they risk poor nutrition and reduced growth. Bed-wetting is common in school-aged children due to increased production of urine.

Some children with ARPKD are vulnerable to infections either of the bile ducts in the liver (acute cholangitis) or urinary tract infections. The former lead to pain in the upper part of the abdomen, fever and vomiting. Urinary infections can also cause fever with pain on passing urine and pain in the back. Small children with tummy pains may not be able to tell exactly where it hurts. Simple tests are needed to confirm where the infection is.

Many of those with ARPKD have high blood pressure. Children should therefore have regular blood pressure measurements so that this is picked up and treated before it causes problems.

What can be done about it?

As yet there are no treatments that can reverse or slow the progression of ARPKD in humans. Treatment is therefore aimed at each patient's symptoms and should be managed by a specialist centre with expertise in this disease.

Young children with ARPKD have an increased risk of dehydration if they get fevers, diarrhoea or vomiting for any reason. Adequate water consumption is therefore very important, especially on hot summer days and during sports activities.

Patients cannot tell how low their kidney function is by how they feel. Blood tests are needed to find out the exact level of function. This is described under different Stages of Chronic Kidney Disease (CKD). Parents and children need to know how far the condition has progressed as different treatments are needed at different stages.

Children with mild kidney problems (CKD stages 1-3) may only need simple treatment and regular monitoring by a kidney specialist. This may involve adjustments to the diet and nutritional supplements, as well as regular checks on blood pressure. High blood pressure is common with ARPKD and may need more than one type of medication to control it.

Advanced kidney failure (CKD stages 4-5) will need to be treated by dialysis or transplantation. Occasionally the kidneys are so enlarged that one or other may have

to be removed to make space for in the abdomen for comfort and for feeding. Liver disease is common but often mild. During the mild or moderate stages there are two potential complications of the liver disease. The first of these is infection in the bile ducts. This is called cholangitis. It cause pain in the upper abdomen, vomiting and fever. It usually responds to antibiotics and in some cases antibiotics can be used to prevent infection.

The second problem is the development of internal varicose veins in the gullet and stomach (varices) which can cause internal bleeding. If varices are suspected an investigation called an endoscopy will be carried out which can detect and treat varices. For this the patient is sedated and a flexible 'telescope' (endoscope) is passed down the gullet into the stomach. The operator can see if there are any distended veins, assess the risk of any of them bleeding, and treat them directly.

If there is severe liver damage liver transplantation may be needed. Sometimes it is better to undertake both liver and kidney transplantation at the same time. For this it is important that an assessment is undertaken jointly by the liver and kidney medical and transplant teams. For children in the UK this operation is only undertaken at Birmingham Children's Hospital

How the disease works

ARPKD causes faulty development and growth of the small tubes (tubules) that make up the kidneys. In particular there are bulges in these tubes and irregular growth that lead to cysts. The tubules are important in regulating how much water is held in the body. In ARPKD this is disrupted, which is why small children lose excessive amounts of body fluid as urine. They therefore risk dehydration.

Over time the kidneys become enlarged because of the cysts, and scarred (fibrosis). The overall kidney function deteriorates.

A similar problem happens in the liver. The bile ducts are very small tubes that allow bile fluids made in the liver to flow towards the gall bladder and intestines where they are used in digestion. The small bile ducts may also be bigger than usual with irregular growth and sometimes cysts. Over time the liver develops fibrosis, a process like scarring. This restricts the blood flow through the liver and increases the pressure in its delicate blood vessels (portal hypertension).

In portal hypertension, blood bypasses the liver and is diverted into veins. These become distended (varices), particularly in the lower gullet (oesophageal varices). Varices that get beyond a certain size can bleed.

Portal hypertension also diverts blood to the spleen which becomes enlarged. A normal function of the spleen is to remove old or damaged blood cells. An enlarged spleen may remove too many of these, including platelets. Platelets are cell fragments in the blood that make the blood clot if a blood vessel is damaged. With too few platelets left in the blood there is an increased risk of bleeding.

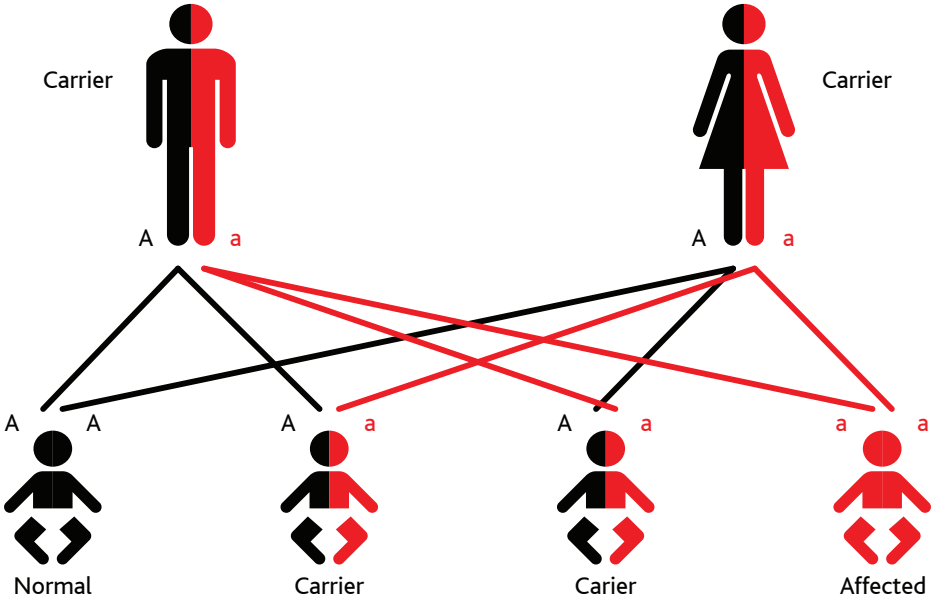
Oesophageal varices and a low platelet count together increase the risk of internal bleeding (internal haemorrhage).

Other functions of the liver, such as the supply of proteins for normal processes in the body, are usually maintained even when there is advanced liver damage. Jaundice occurs only as a very late event or if the biliary system gets infected (cholangitis).

How is it inherited?

ARPKD is an inherited condition caused by a genetic alteration in the gene PKHD1. Everyone has two copies of the PKHD1 gene – one from each of our parents. ARPKD only occurs when both parents pass on a copy of a mutated PKHD1 gene to their child. Boys and girls are affected equally.

This pattern is called autosomal recessive inheritance. The parents of affected children do not have the disease themselves because they each have one normal copy of the gene which overcomes the effect of the mutated one. They are therefore known as carriers of the condition. If both parents are carriers, then the chances of a child receiving two faulty genes, one from each parent, is 1 in 4 (or 25%). If the child receives only one copy of the mutated gene, then they will be unaffected by ARPKD but will be a carrier of the disease just like their parents.



a = ARPKD gene with mutation *A = ARPKD gene without mutation*

The diagram shows how ARPKD can be passed on to the children of two carrier parents.

Genetic testing can be helpful. It is usually offered when there are grounds to suspect that parents are carriers of the mutated PKHD1 gene, for example when an ultrasound scan during pregnancy suggests ARPKD, or if a couple already has a child with the condition. Currently not all mutations are identifiable due to the complexity of the PKHD1 gene. A negative test is therefore unhelpful and cannot exclude ARPKD. Testing is becoming more reliable with improvements in genetic techniques.

Antenatal counselling provides an opportunity to discuss options about the future of a pregnancy. When both parents are confirmed carriers of a known PKHD1 mutation, it is possible to discuss pre-natal and/or pre-implantation genetic diagnosis (PGD). In this technique, embryos are tested during a cycle of in vitro fertilisation (IVF) and only unaffected embryos are transferred into the mother's womb to enable the birth of a child without ARPKD.

RareRenal.org

RareRenal.org provides comprehensive information about the rare disease initiative of the Renal Association.

It includes:

- Patient Information
- Clinician Information
- Information about national expert groups (Rare Disease Groups)
- Information about the National Registry for Rare Kidney Diseases (RaDaR)

Presentations from today's event will be available on the site shortly.
http://rarerenal.org/

RaDaR

RenalRadar.org

The ARPKD Rare Disease Group (RDG) is working with international partners with the aim of finding new and improved treatments, and to empower patients. A first step is to compile the symptoms, treatments used and markers of ARPKD.

To do this the RDG is registering for patients with this condition in the National Renal Rare Disease Registry (RaDaR). The database will be used to find suitable participants for future research trials into the effectiveness of new treatments. If you are interested in finding out more about RaDaR or the activity of the RDG please contact arpkd@rarerenal.org

Sources of support

Contact a Family

Contact a Family is a national charity that exists to support the families of disabled children across the UK. They provide information, advice and support and campaign to improve the circumstances of families with a disabled child and for their right to be included and equal in our society.
www.cafamily.org.uk.

ERIC

ERIC is a national charity that supports children with continence problems and campaigns for better childhood continence care.
www.eric.org.uk.

Coram Children's Legal Centre

Coram Children's Legal Centre (CCLC) specialises in law and policy affecting children and young people. CCLC provide free legal information, advice and representation to children, young people, their families, carers and professionals.
www.childrenslegalcentre.com

Educational Equality

Educational Equality was founded to provide honest, independent information in support of all families of those with special educational needs.
www.educationalequality.co.uk

Gov.uk

Government website which has the main documents to support children and young people at school with medical and/or special educational needs.
www.gov.uk/government/publications/supporting-pupils-at-school-with-medical-conditions--3
UK Government Benefits Info.
www.gov.uk/browse/benefits

Independent Parental Special Education Advice

Independent Parental Special Education Advice offers free and independent legally based information, advice and support to help get the right kind of support for children and young people with special education and medical needs.
www.ipsea.org.uk

The Information Advice and Support Network

Information, Advice and Support Network supports and promotes the work of Information, Advice and Support (IAS) Services across England. IAS offer a statutory service which means there is one in every local authority. They provide advice, information and support to disabled children and young people and those with special education needs and their parents.
www.iassnetwork.org.uk

Family Fund

Charity aiming to support, advise and possibly help with funds for families with severely disabled children.
www.familyfund.org.uk

React

React - Rapid Effective Assistance for Children with Potentially Terminal illness is a dynamic charity working to improve the quality of life for children with life-limiting illnesses living in financially disadvantaged households throughout the UK.
www.reactcharity.org

Roald Dahl's Marvellous Children's Charity

Roald Dahl's Marvellous Children's Charity helps to make life better for seriously ill children in the UK. We focus upon helping those who have the biggest needs, and who aren't being fully supported by anybody else. This might be because they have a serious rare condition, be living in poverty, or not have any family at all.
www.roalddahl.com/charity

Independence at Home

Independence at Home is a charity that provides grants to people of all ages who have a physical or learning disability or long term illness and who are in financial need.
www.independenceathome.org.uk

Links to other charities and organisations

- National Kidney Federation (NKF) - help and information to support kidney patients and their carers, in particular those on dialysis.
  www.kidney.org.uk
- British Kidney Patient Association (BKPA) - financial support and grant aid for kidney patients.
  www.britishkidney-pa.co.uk
- Turn2us - helping people access money available to them through welfare benefits and grants.
  www.turn2us.org.uk
- NKF Advocacy Service
  www.kidney.org.uk/advocacy-service
- Humberside KPA
  0845 601 0209
- West Riding KPA
  wrkpa@hotmail.co.uk

For your notes

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PKD Charity Support and Information

About 70,000 adults and children in the UK have Polycystic Kidney Disease or PKD - life-threatening inherited conditions that can cause renal (kidney) failure and affect other organs in the body. We support those affected, their families and carers.

We raise awareness and fund research

Support available

Our Support Line is available Monday to Friday, 10 am to 4.30 pm or leave a message on answerphone: 0300 111 1234.

You can also find support from the online groups below:

- Facebook ARPKD Group
  www.facebook.com/groups/ARPKD/
- HealthUnlocked ARPKD Community (UK only)
  www.pkdcharity-autosomalrecessive.healthunlocked.com/
- ARPKD/CHF Alliance
  www.facebook.com/groups/89846751499/
- PKD UK Yahoo Group
  uk.groups.yahoo.com/group/PKD_uk/
- PKD Charity UK Facebook Page
  www.facebook.com/pkdcharity/
- PKD Charity Facebook Group (UK only)
  www.facebook.com/groups/pkdcharityUK/
- Parents of Children with PKD Facebook Group
  www.facebook.com/groups/Parentsofchildrenwithpkd

The information provided in this booklet is correct to the best of the event organiser's knowledge but is not a substitute for personalised advice from your clinician.