PCD Day, 22nd June 2013 at the David Lloyd Centre, Milton Keynes

PCD Day was a great success, with lots of families travelling from various parts of the country to attend this enjoyable and informative event. The children were entertained by the ever popular Great Gappo with his magic tricks and circus skills, and later had party games and a selection of active games.

PCD management service – Jane Lucas

Fiona welcomed everyone, outlined the programme, and introduced the first speaker, Dr Jane Lucas, Paediatric PCD Consultant, from University Hospital Southampton. She gave a fascinating talk about the newly commissioned PCD Management Service for children and the hope to develop a similar service for adults. It was the first 'public viewing' of the National PCD Service logo showing five cilia representing the five PCD centres in London, Southampton, Leicester, Leeds and Bradford.

She explained that in 2005 PCD was thought to occur in one in fifteen thousand of the population. However, this would mean that there are about 70 PCD births a year, and approximately 3,000 UK cases, but only 236 were known to the PCD Family Support Group. It was therefore recognised that PCD was under diagnosed in the UK. The implications of this are: bronchiectasis; inappropriate ENT procedures and management; inappropriate genetic counselling; the patients themselves are unaware of their diagnosis.

In 2006 the Brompton, Leicester and Southampton Hospitals collaborated together and persuaded the Secretary for Health to set up a diagnostic service for PCD. PCD is diagnosed by examining and analysing the function and structure of the cilia using imagining of live cells and electron

microscopes. Nitric Oxide testing is also used as a screening test. Between 50 and 70 cases a year are now being diagnosed in England and these cases need expert follow up.

Funding for a Management Service of PCD for children was obtained last year with the help of a survey carried out by the PCD Family Support Group. This service is being set up in the five centres (London, Southampton, Leicester, Leeds and Bradford). In each centre the patients have access to both respiratory and ENT consultants, audiology, physiotherapists, microbiology labs etc. It is a patient focussed service with shared protocols and national meetings. Each patient is to have an annual review by the PCD team including ear nose and throat consultants, with an opportunity for further appointments or shared care with a local hospital. There is also to be telephone advice available week days between 9.00 and 5.00. Home visits and school visits are to be available in selected cases and also careful transition to adult management. This is a huge achievement for the care of PCD patients. Work is in progress to provide a similar service for adult management of PCD.

She went on to talk about research into PCD and said that there are presently no studies or research into how to best treat PCD, although it is known that physiotherapy must be done every day. Recent research has been done into radio aerosol mucociliary clearance, where a low dose of radioactive material is breathed in, and then the person is scanned at intervals to detect how quickly the aerosol is removed from the lungs. In healthy volunteers most of the material had gone within one hour, and by four hours it had all gone. However, in PCD volunteers it was still there after four hours, and some of it was still there after 24 hours. She showed us some amazing scans to illustrate this. The results were similar regardless of whether the PCD volunteers were well or not. This is a new test and it could be useful to diagnose difficult cases, but volunteers are needed to further the research.

She said that a European study into PCD involving the Brompton and Southampton Hospitals was being undertaken, and asked for volunteers who would be happy to be interviewed.

Next year the first ever medicine study is to be done in PCD. Volunteers are being sought to take part to assess the efficacy of Azithromycin in the management of PCD. Volunteers would be divided into two groups, with one group being given a placebo, and one being given Azithromycin for six

months to assess which group does better. It is thought that Azithromycin is effective in managing PCD, but evidence is needed to make sure that the benefits outweigh any risks.

Some PCD patients do better than others regardless of the type of PCD that they have, and it is not clear why. She went on to explain that because of the new management service, PCD patients can access any of the centres of excellence, choose where they would like to go, and do not need permission from their GP in order to do this. She also pointed out that all paediatricians in the country have received letters to raise awareness of PCD and to inform about the new service.

Physiotherapy – Lynne Schofield

The next speaker was Lynne Schofield, an inspirational PCD physiotherapist from Leeds/Bradford. She told us about her in depth research study on five children with PCD aged between eight and fifteen living in Bradford. The research was designed to understand what it feels like to have PCD and being asked to do chest physiotherapy every day. There were two girls and three boys, and she interviewed them in their own homes. She examined their experiences and perceptions of having PCD, and the impact it had on their lives in terms of physical symptoms, day to day limitations and emotional burden. All had unique experiences of PCD, and all had symptoms from birth. However these symptoms were reframed as signs of illness after diagnosis. All used unique language to describe their PCD symptoms which include coughing and breathlessness. She talked about the importance of attitude to long term illness "glass half full or half empty" and concluded that there was a need for psychological intervention in PCD. She emphasised the need to keep a health perspective rather than an illness one, and the importance of patient empowerment and flexibility in treatment.

She then went on to describe the physiology of lungs using animations and slides. She explained that adults have 300 to 500 million alveoli which are air sacs at the ends of the lungs. Normally the cilia beat and waft about one pint of mucus a day up to the throat. This is imperceptibly swallowed in a normal person. The mucus contains a lot of water and this keeps the mucus thin. She emphasised the need for PCD patients to keep well hydrated and do regular chest physiotherapy. She explained that normal coughing expels mucus from the large airways, but does not remove it from the small airways. Chest physio is necessary to do this. If mucus is not cleared, then a warm wet environment is provided for bacteria to grow, and the airways can block causing pain, shortness of breath and poor lung function. She said that technique was very important and that most patients tend to rush their physio and they need to slow down and use the correct muscles. She compared rivers to the large airways and streams to the small airways, and stressed the importance of clearing the small airways

and taking time to do this properly. She also emphasised the importance of good huffs to clear effectively, and suggested imagining an elephant standing on your tummy so that tummy muscles are used effectively. To clear the small airways the technique is to take a small slow breath through the nose, hold, and then a long huff out. To clear the large airways take a full slow breath through the nose, hold, and then a fast huff out. She demonstrated nose blowing techniques and stressed the importance of good technique. This involved closing one nostril, and blowing out through the other nostril, whilst imagining that there is an elephant on your tummy. She recommended nose blowing before physio.

Latest Research – Hannah Mitchison & Mustafa Munye

Hannah Mitchison, a PCD researcher at the Institute of Child Health, then gave an interesting talk on the latest research into PCD. She explained that there are motile cilia in the airways, brain, and reproductive system (fallopian tubes and sperm). In the embryo nodal cilia control the positioning of the organs and therefore in PCD sometimes the organs are reversed because the cilia do not beat normally.

She went on to explain that there are many different types of cells, and they all contain DNA in the nucleus. Every cell has two metres of DNA in it, and these contain our genes. She said DNA is like an instruction in a book, and the book (genome) contains 23 chapters (chromosomes). Each chromosome or chapter has 48 to 250 million letters. Each book contains 3.2 billion letters or 20,000 genes. Researchers are looking for a "reading error" in these genes, which is obviously a huge task.

She explained that when two parents are carriers of the PCD reading error, then there is a 25% chance for any of their children to inherit this reading error from them both, and be affected with PCD. For PCD parents, there is a 50% chance of their children being a carrier. Siblings of PCD patients have a 50% chance of being a carrier. She knows of examples from isolated populations where PCD patients have had a child with PCD, however there are no such examples yet from the UK population. Consanguineous marriages (i.e. interfamilial marriages) are a problem for inherited disease since the risk of having affected children are increased when marrying within the family. Genetics can help with inheritance testing.

It is hoped that in the future when the problem genes have been identified, they can then be replaced by gene therapy. In Cystic Fibrosis there is just one gene involved, and therefore it is much simpler to work on. There has been some success in this field, and drugs can be used to skip over the error. PCD is more complicated because there may be one hundred genes involved. She asked for volunteer families to help, and to give blood and saliva tests. She is collaborating with other centres in research and explained that the research is funded by applying for small grants. She uses next generation sequencing of DNA, which is new technology developed in the last five years. She

works with blood samples of PCD patients, and these are then compared to those of someone without PCD. A complete analysis takes two weeks. Reading errors in several genes cause PCD. She has been working with a family in Holland living in an isolated area where relatives have common ancestors and this has been very useful.

She explained that she also uses zebra fish and an injection machine provided by the PCD support group for research. She is looking at a particular gene CCDC114 which causes the loss of outer dynein arms and static cilia. In the last decade 20 different genes causing PCD have been identified so far, and these cause about half of all PCD cases. Within the last three years half of these have been identified with the help of the new technology. She explained that interest in genetics can complement diagnosis.

Mustafa Munye also from the Institute of Child Health then gave a fascinating talk about developing gene therapy for PCD. He explained that PCD is a hereditary disorder affecting cilia movement, a multi systemic disease, and the focus is on managing the airway symptoms.

He said that 20 genes have been identified that cause PCD so far, and that DNAH5 causes PCD in one in four patients. Therefore work is being done to try and correct this particular gene as it would help a lot of patients. Gene therapy is the therapeutic introduction of genetic material into cells to correct them. Particles can be nebulised to get them into the patient's cells. A receptor targeted nanocomplex vector system optimized for respiratory gene transfer is used. The treatment would be life long. The hope is that introducing DNAH5 into PCD cells will restore cilia beating. Research is being carried out to assess what proportions of cells need to beat in order to give good mucus clearance. Mucus clearance testing and mucus transport is being assessed using beads. He showed us a video with beating cilia moving beads around to explain this. Nebulised gene therapy could be done every few months to keep symptoms at bay.

He explained that a lot has been learned from gene therapy in Cystic Fibrosis. A trial has been done in London with CF patients and we are waiting for the results, but it appears to be working well at the moment. It could be five to ten years before there are clinical trials with gene therapy for PCD.

AGM – Fiona Copeland & Mick Wilkin

After a delicious lunch and opportunities to chat to the speakers and others with PCD, Fiona Copeland chaired the AGM.

The minutes of last year's meeting were approved. Fiona outlined what we have achieved this year. This included supporting people affected by PCD by means of our website, help line and newsletters. She explained that social media in relation to PCD has grown with 24k hits on the website, 214

Facebook likes, 30 followers on Twitter and 130 followers @pcdmum. There has also been a growth in the number of enquiries about benefits and DLA, and there is information about this on the website. The website has continued to be funded and printable pages have been introduced.

Fiona has given talks to medical students and attended the British Thoracic Society Conference. The next one is on 5th December, and Fiona will give a talk there. Anyone can come and will hopefully wear a PCD T shirt. Expenses will be paid. Fiona also gave evidence to the Independent Review Panel re changes to paediatric cardiac surgery at the Brompton.

She thanked the families who spoke to the media, raising awareness of PCD. Fiona helped to organise and also spoke at the CAUK conference. Terry won a prize of a PCD animation that we are using. We are helping to implement and develop the Paediatric PCD Management Service and working with adult physicians to push for an adult fully funded PCD Management Service and a bronchiectasis database. Fiona represented CSLD patients at the Brompton BRU. She also encouraged patients to take part in research and supported bid applications.

Nikki, one of our committee members, will now supervise fundraising for the group. She has already ordered T shirts and collecting boxes. This year we raised funds by organising a jazz night, sponsored runs, the sale of PCD angel necklaces, the give a car scheme, and various celebrations. Jason ran the London marathon for PCD. Mick climbed three peaks and raised £1,000.

Fiona asked Justine, one of our committee members, to speak about the newly formed Respiratory Alliance where she represents us. She explained that they have funding for this year only and would like to raise awareness and ultimately be on a par with breast cancer etc. Their main aims are to drive up clinical quality, reduce service variation and access to services, research and some government lobbying.

Mick, our Treasurer, then did the financial review. He said that the cash reserves were £17,000 last year and we ended this year with slightly less. Fundraising produced £13,145 which was about the same as last year. £6,000 is now coming in as part of the PCD management service funding for maintenance of our website. Our costs this year have risen from £8,343 to £15,119. £2,397 has been spent on updating and improving the website, £1,831 was spent on medical equipment, £1,767 on the 2012 PCD Day and AGM and £4,755 was spent on marketing materials, pens, leaflets etc. The accounts were approved and it was agreed to reappoint our independent examiners.

He said that the economic climate continues to be difficult, and asked for help with fundraising. Our running costs are about £11,000 with our current plans, and we are a going concern for the foreseeable future. However, we may have to decline some requests for the time being.

Fiona outlined plans for 2013/14 and these include continuing to work with the NHS, RBHT re changes to hospital services, helping to implement the new paediatric PCD Management Service, helping to develop

transition and adult service, and attending the BTS Conference and the Rare Diseases meeting in December 2013.

Fiona appealed for volunteers for someone to work on government information standards and also some others to give talks. She also asked for volunteers to attend events, conferences and meetings and explained that travel expenses would be paid.

Officers were formally re-elected: Chairman, Fiona Copeland; Treasurer, Mick Wilkin; Secretary, Myra Tipping; Adult Contact, Sylvie Prouse; Child Contacts, Sarah Kirk and Joanne Wilkin. Other re-elected members of the committee are Justine Currie, Gary Tipping , Terry Irwin, Nikki Keech and Liz Meleady. Fiona also asked for new volunteer committee members, in particular any parents with young babies/children so that this group can be properly represented. Glenda Dalton has now formally resigned from her role on the committee. Fiona and the committee thanked Glenda for all her help over the past few years.

Q&A – Stuart Copeland

Next was a lively and stimulating question and answer session with Stuart acting as facilitator and the opportunity for anyone to put questions to the experts. One of the questions centred on how to cope with a disinterested GP. It was advised that this patient should ask their PCD consultant to write a management plan letter for them to include such things as their preferred rescue antibiotic and that they should have a two week course. Another question asked why PCD patients have reflux problems. Whilst not really known, bronchiectasis patients also commonly suffer from this, and in such cases it was thought to be associated with coughing. It was asked if there was a test for PCD carriers and how to find out which known genes they carry. The answer to this was that at the moment there isn't a test for PCD carriers, but taking part in research could help with this. Because of all the interest in genetics it was suggested to have a geneticist to speak to us next year. Another question was about the radioactive material inhaled into the chest taking so long to be expelled and whether the same thing was likely to happen with cigarette smoke and other pollution. Indeed yes, this is likely to be the case and why it is so important that patients undertake their physiotherapy regime. Another question was in relation to plans for adult care and the support group are doing what they can to assist with this.

Fiona asked everyone to fill in the feedback form and asked for ideas for speakers next year.

Summary

PCD Day always provides further insights into PCD and its management, and provides opportunities to meet others with the condition in an informal environment. The children had a great day too being entertained all day!