

NPPG 7th Annual Conference Report

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In Glasgow, from September 28th – 30th, 160 delegates from the United Kingdom, Ireland, Norway, Sweden, France, Argentina, Australia and New Zealand attended the 7th annual conference of the Neonatal and Paediatric Pharmacists Group (NPPG).

Welcoming delegates to the conference Jonathan Best (Chief Executive Yorkhill Trust) spoke of the levels of deprivation for children in the Glasgow area and how, in partnership with other services, the health service in initiatives such as free fruit for primary schools, free swimming in all health centres for children and oral hygiene services to nurseries was hoping that early intervention in child health would lead to a reduction in adult health problems.

Neonatal / Respiratory Problems

Dr Jonathan Coutts (Consultant Neonatologist, Yorkhill Trust) spoke of the advances in respiratory management of premature babies. These advances have led to a decrease in the number of babies who develop Broncho-pulmonary Dysplasia (BPD) – defined as being oxygen dependant at 28 days of age. The introduction of artificial lung surfactant has led to a decrease in lung disease and the main debate over its use now lies in whether to use artificial or naturally derived drugs and whether it's use should be prophylactic or as rescue therapy. New ventilator techniques, including high frequency ventilation which optimises lung inflation have also been of benefit – better square waves, shorter inspiratory times. Treatment can optimise lung inflation, using high pressures, initially to aim for a low (<30%) FiO₂. Another benefit has been the usage of antenatal steroids to mature premature lungs. As a result a 'new' type of BPD is now seen where there is less lung damage and the babies are, in the main, just oxygen dependant. Treatment revolves around oxygen therapy, short-term high dose steroids in severe cases, bronchodilators and diuretics. Steroids were seen as bad, then good and are now bad

again because of poor developmental outcomes. They are now only given if it is thought that the baby will die without treatment. There is debate as to whether the problem is caused by the dexamethasone itself, rather than a steroid effect, as antenatal dexamethasone is associated with worse outcomes than betamethasone.

There is a move to more babies being discharged on home oxygen, which provides a better environment for the babies and parents, rather than long term in a hospital ward. This also leads to increased demands on both hospital and community pharmacists and is an area which involves a high degree of liaison between secondary and primary care. Lung growth of new alveoli continues until 8 years of age only. After this the alveoli present just grow larger. BPD babies suffer from increased chestiness and have subtle differences in exercise intolerance in adulthood.

Premature babies have a high pulmonary vascular resistance and a potential result of this is the development of Persistent Pulmonary Hypertension of the Newborn (PPHN). This is a cardiopulmonary disorder characterized by systemic arterial hypoxemia secondary to elevated pulmonary vascular resistance with resultant shunting of pulmonary blood flow to the systemic circulation. Systemic vasodilators have side effects and are not recommended. The treatment of choice is inhaled nitric oxide, which is a natural vasodilator and only enters the ventilated alveoli. It is inactivated by haemoglobin once it enters the bloodstream. It is easy to give via a ventilator and a portable system is available for transfer of patients between hospitals. Extra corporeal membrane oxygenation (ECMO) is used as rescue therapy in cases of severe respiratory failure and is currently available in 4 centres in the UK.

Complications associated with ECMO include:

- haemorrhage (due to the need to heparinise the blood flowing through the circuit)
- circuit problems
- loss of the carotid artery

- long term developmental studies are awaited

If ECMO is not working an alternative is liquid ventilation using perfluorocarbons.

Respiratory Syncytial Virus (RSV) is a common cause of bronchiolitis in babies and young children. Healthy infants do well (mortality < 1%) but high-risk infants can have a mortality rate up to 30%, or can suffer long term respiratory problems. Recently palivizumab (a humanised murine RSV IgG monoclonal antibody) has been launched for passive vaccination against this illness. Studies have shown it to decrease hospitalisation and ICU admissions but treatment cost is expensive at around £3,000 per patient. In Greater Glasgow strict adherence to the SPC guidance could have resulted in an annual cost of over £2 million. Following a review by paediatricians and pharmacists treatment criteria were agreed to target the most vulnerable patients and this was funded by the Health Board. In addition to vaccination, in the community parents have to be educated to the risk of RSV, including the prevention of cross infection. The role of ribavirin was queried as to its effectiveness.

Neonatal Surgery

Speaking on the topic of 'Neonatal Surgery – size does matter' Carl Davis (Consultant Neonatal Surgeon, Yorkhill Trust) covered the range of neonatal conditions treated surgically at Yorkhill including congenital anomalies (often multiple) and prematurity associated conditions such as Necrotising Enterocolitis (NEC). As with respiratory problems there is a changing pattern if the diseases to be treated. The prevalence of neural tube defects continues to fall even with the lack of publicity on the use of folic acid in women's press. Many other defects are picked up antenatally.

With respect to pain control the use of epidural analgesia has greatly benefited neonatal surgery, with resultant decrease in the need for post operative ventilation. There still remains, however, the need to find a suitable agent to bridge the gap between paracetamol and morphine.

Neonatal surgery requires a multi-disciplinary team and an example of this is in the treatment of short bowel disease. Here the aim is to get patients home, possibly on home TPN (total parenteral nutrition). The pharmacy aseptic unit at Yorkhill provides, on average, 400 TPN days to the neonatal surgery unit per month. Enteral

feeding is used where possible and, as with healthy babies, 'breast is best'.

Congenital diaphragmatic hernia is a long-term in-utero problem, which can result in complications, even after surgery. An option is the use of in-utero surgery, but this is still a very emotive area. Treatment strategies include ECMO, but this does not treat the smaller lung, only resting the respiratory circulation. A possible treatment option is the use of liquid ventilation with perfluorocarbons. There have been no trials to date, only anecdotal data and small series reports.

Administrative

At the AGM of the NPPG the decision was taken that the group would support the formation of a faculty of Neonatal and Paediatric Pharmacy by the College of Pharmacy Practice. It is expected that the faculty will be formed later this year.

The motion was also passed, with just one vote against, that the NPPG become a 'company limited by guarantee' with each member's liability being £1.

Four members of the committee stood down – Malcolm Partridge, Tony Nunn, Anne Frankish and Vicky Bradnam. There were four nominations for election, so no election was necessary. At a subsequent committee meeting over lunchtime the roles of new chairman and treasurer were decided. Details of the new committee can be found on the committee pages of the NPPG website.

At the close of the conference James Wallace praised the contributions of both Malcolm Partridge and Tony Nunn to the NPPG. Both had been involved in the foundation of the group and had made major contributions to the group over the past 7 years.

Research is an important aspect of the NPPG conference and this was in the form of oral presentations and posters. Twenty posters were presented at the conference by paediatric pharmacists and technicians, covering a wider range of topics. Full details can be found on the NPPG website (www.nppg.demon.co.uk).

Oral presentations covered adverse reactions, drug errors, TDM and drug disposition, intra thecal therapy and neonatal pain relief. A report on these presentations will hopefully appear in the next issue.