Meningitis and septicaemia – role of the practice nurse

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Meningitis and septicaemia are deadly diseases that can strike anyone without warning, killing one in ten, and leaving a quarter of survivors with life-long after effects. Meningitis can cause deafness, severe mental impairment, spasticity, paralysis, epilepsy and blindness. Septicaemia can cause amputations, tissue and skin loss requiring reconstructive surgery, growth arrests and deformities. In addition to these disabilities, many survivors are left with less obvious emotional and cognitive problems which often do not become apparent until a child reaches school age. Few illnesses in Ireland can cause such a diverse range of disabilities amongst survivors. The single most effective thing that parents can do to protect their children from meningitis and septicaemia is to make sure they are fully immunised. Every injection in the routine immunisation programme for babies protects against some form of the disease.

VACCINATIONS – THE STORY SO FAR

The introduction of conjugate vaccines to the routine immunisation schedule has been a huge success, resulting in a massive decline in disease incidence across Ireland.
Since the introduction of routine MenC vaccination, incidence of type C meningococcal disease has been reduced from approximately 150 cases in the year 2000 to up to 5 cases per year at present. Similar success has been seen with the Hib vaccine which was routinely introduced into the schedule in 1992. At the time of its introduction, Hib was responsible for up to 100 cases of meningitis each year. Today Hib is responsible for approximately two cases annually.

October 2008 saw the introduction of a pneumococcal conjugate vaccine, which protected against the seven most common and dangerous strains of invasive pneumococcal disease (PCV7). In December 2010 this vaccine was upgraded to a vaccine which protected against 13 strains of pneumococcal disease (PCV13). The introduction of PCV13 protects against approximately 90% of serotypes responsible for invasive pneumococcal disease in children under 2 years of age.

**DECREASE IN UPTAKE**
Although this is all very positive news, there is currently cause for concern; new data from the Health Protection Surveillance Centre has identified a significant decline in the uptake of the PCV vaccine given at 12 months and the Hib booster given at 13 months. The levels are now well below the World Health Organisation’s targets. This decline in the number of people completing the immunisation programme not only raises concerns for those children who are unprotected on an individual level, but also has implications for the protection of the population as a whole. Vaccines not only protect those who have been directly immunised but also protect the community at large by reducing the number of people carrying and therefore potentially transmitting the bacteria to the rest of the population. It has already been demonstrated that the vaccination of infants with PCV7 has reduced the incidence of pneumonia caused by the seven strains contained in the vaccine amongst the rest of the population (those aged over 5). In addition to vulnerable individuals over 5 years of age, new born babies are also at risk. A Meningitis Research Foundation (MRF) funded study on bacterial meningitis in infants under 3 months has shown that a proportion of neonates are getting pneumococcal meningitis. Under two months, babies are vulnerable to disease because they have not yet received any vaccinations so it’s important for children to complete their immunisation programme in order to maintain herd immunity in the population.

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It is unclear as to why there has been a decline in the uptake of vaccines, although the Health Protection Surveillance Centre is currently investigating this. In recent years, damaging myths about vaccine safety have had substantial press coverage, this combined with the dramatic reduction in the risk of disease may have led to some parents to become more anxious about vaccinating their child than they are about the child acquiring disease.

Healthcare professionals have been identified as the most important source of vaccine information for parents and can be influential in parents’ decisions about whether or not to get their children vaccinated. For this reason it is vital that community practitioners engage with parents and take the time to allay any concerns they may have about immunising their children.\(^5\) MRF’s publication, Vital Signs Vital Issues contains a question and answer section about how to deal with common vaccination concerns from parents – which is particularly helpful for general practice nurses.

Vaccinations – the future

Over the last 10 years we have seen a dramatic reduction in the incidence of meningitis and septicaemia and have come a long way in improving prevention, detection and treatment. However, meningococcal group B disease remains the leading cause of life-threatening meningitis and septicaemia in Ireland accounting for over 110 cases each year, and there is no vaccine currently available.

Developing a vaccine to protect against menB has been particularly challenging because the polysaccharide capsule surrounding the bacteria (the basis for all successful vaccines introduced against bacterial meningitis so far) contains surface structures resembling those of foetal brain cells and so are poorly immunogenic. Scientists have therefore had to try and produce a broad spectrum vaccine from components of the bug other than the capsule. Novartis has produced a vaccine containing four different protein based antigens, but the proteins they contain are variable and are not always present on the bacterial surface of all menB strains. Most menB strains do contain at least one of the antigens in the vaccine however, and the good news is that scientific studies have indicated that this vaccine should cover at least 75% of European strains.

Novartis submitted their vaccine for licence in December 2010 and if they are successful this vaccine may be licensed by 2012. MRF hope to see the vaccine introduced to the routine schedule, however it is important to note that that this would not be the end of meningitis. There may be strains of menB the vaccine will not cover, and other rarer types of meningitis including most neonatal meningitis (which is caused by a diverse array of bacterial infections) is not currently vaccine preventable.

**SYMPTOMS**

It remains vital that health professionals and the public are aware of the signs and symptoms of meningitis and septicaemia. Research funded by MRF recently revealed that six symptoms: limb pain, a rash, stiff neck, dislike of bright lights, confusion and cold hands and feet can help differentiate meningitis and septicaemia from other self limiting flu-like illnesses.\(^6\) These are important findings because approximately half of children with meningococcal disease are not identified at the first consultation in primary care.

The Meningitis Research Foundation funds research to prevent meningitis and septicaemia and to improve survival rates and outcomes. The foundation also promotes education and awareness to reduce death and disability and give support to people affected as well as produce an extensive range of materials for you and your patients. Copies of these materials can be obtained from the foundation at any time. Call, email or order on-line at www.meningitis.org.

**References**

4. HPA. Cumulative weekly number of reports of Invasive Pneumococcal Disease due to any of the seven serotypes in Prevenar 7™ :Persons aged >5 Years in England and Wales by Epidemiological Year: July-June (2004 – To Date). 2011 30/06/2011; Available from: http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/Pneumococcal/EpidemiologicalDataPneumococcal/CurrentEpidemiology/Pneumococcal/InPrevenar7/pneumo03Cumulativeweekly5INPrevenar7vacc/.

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