MMR vaccination

Report of the Associate Director of Health Improvement, Herefordshire Primary Care Trust.

Introduction

In the DPH report 04/5, I drew attention to MMR immunisation rates in Herefordshire. I noted that whilst overall uptake rates have increased in the last year, we have still not reached the national recommended levels, and that this is of particular concern given an increase in MMR notifications. In 04/5, 79% of two year olds were immunised against MMR, compared with a national target rate of 95%. I also drew attention to the variation in rates across the county (ranging from 48% to 90% of GP practices'under 2 years populations.) This issue remains of concern because there is now evidence of a rise in the infections this vaccine is supposed to prevent. For example, in the first 5 months of 2005, there were 207 cases of mumps among the 15 – 24 year old population across Herefordshire and Worcestershire, compared with 102 in the whole of 2004. The DPH report recommended that attention should be focused on improving MMR uptake rates, and that a localised take-up campaign should be delivered through community pharmacists.

In its discussion of the DPH report, the Health Overview and Scrutiny Committee asked for more information about the safety of the MMR vaccine, in the context of the national debates that have taken place. This paper gives a summary of key points as a general briefing for members of the Committee.

Background

The national MMR programme began in 1988, by which time it had been successfully in place in the US for 15 years. The World Health Organisation regards its safety record as 'exemplary', and it is in place in over 100 countries globally, with over 500 million doses having been given.

MMR provides protection against measles, mumps, and rubella, all of which are infectious diseases carrying a risk of serious, possibly fatal, complications. In 1987, for example, 86,000 children caught measles and 16 died. Complications of measles affect 1 in 15 children who have the illness, and include chest infections, fits, encephalitis, brain damage, and death. Since the vaccine was introduced, no child has died from measles. Mumps was the most common cause of viral meningitis before the vaccination was introduced, and its complications included permanent deafness, viral meningitis, and encephalitis. Rubella can seriously damage the unborn child. If caught in the first three months of pregnancy, it causes damage to the baby in up to 9 out of 10 cases, and the damage includes damage to sight, hearing, heart and brain.

The Department of Health recommends that children receive two MMR injections, one at the age of around 13 months, and one between 3 and 5 years. Each of these is a triple vaccine, affording protection against all of the three infections.

Research Controversy

There has been on-going public concern about the safety of the vaccine, led by press reports which are either inaccurate or based on subsequently discredited research. As a consequence of these concerns, fewer parents have taken their children for vaccination,

and population immunity levels have dropped. Unsurprisingly, we now see cases of the infections rising and in circulation in the community.

We have the experience of a similar set of circumstances in the 1970s and 1980s, when major concerns (later found to be unfounded) were publicised about the safety of the whooping cough (pertussis) vaccine. At that time, parents were offered the choice of the diphtheria, tetanus, and polio vaccine with or without the whooping cough element. Coverage of whooping cough vaccine fell from 80% to 30% and coverage from the other vaccinations fell as well. Hundreds of thousands of children caught whooping cough in the course of three epidemics, thousands were admitted to hospital, and around 100 died.

The public controversy about MMR started when the Lancet published a paper by Andrew Wakefield and colleagues (1), suggesting a link between the onset of autism with gastrointestinal features and the giving of the MMR vaccine. In the paper, Wakefield actually concluded 'we did not prove an association between MMR and the syndrome described', and made it clear that the study was based on an investigation of only 12 children. Nonetheless, a dramatic media campaign followed and rates began to drop. Wakefield and Montgomery published a further paper again looking at the adverse effects of the combined MMR vaccine (2), but the Department of Health and the Medicines Control Agency reviewed the paper, finding serious errors, including incorrect analysis of trial results, incorrect reporting of the length and detail of studies, and a failure to identify and analyse all the evidence (3).

Since then, a number of large scale and robust studies have shown no association between MMR, autism, and gastrointestinal problems. For example, a retrospective cohort study of over 500,000 children in Denmark concluded that there was strong evidence against the hypothesis that MMR vaccination causes autism (4). In Finland, another study of over 500,000 children found no association between MMR vaccination and encephalitis, aseptic meningitis or autism (5). A review article based on 12 studies from 5 countries which examined Wakefield's hypothesis found that none of the studies provided evidence of an association between autism spectrum disorders and MMR (6). An American study looked at the incidence of autism in people under 21 in one county of Minnesota between 1976 and 1997 and concluded that MMR was introduced over 20 years before the increase in the rate of autism, which suggested that MMR vaccine did not contribute to the rise (7). In October 2005, a full review article of all existing evidence concluded that the current evidence supports current policies of mass immunisation (8).

Single vaccines

There have been some suggestions that the MMR single vaccine should be replaced by a single vaccine giving protections against each of the diseases. It has been argued that this would give the parent more choice to decide what they feel is right for their child.

The Department of Health will not promote this, since using single vaccines would increase the risks, and we cannot offer a vaccination programme which increases risk. Risk is increased because:

- six separate injections have to be given and research shows that fewer children would complete the course of six injections, leaving more children unprotected;
- children are unprotected in the gaps between injections;
- babies will be particularly vulnerable since they will be at risk from older siblings who remain unprotected between the separate injections. The most dangerous age to catch measles is under one year;

- pregnant women will be at greater risk of rubella infection from their own unprotected children and their friends.

There is no evidence that single vaccines have any advantages over combined vaccines, nor that they have any impact of rates of autism, bowel disease, or any other condition.

Conclusion

It is the firm view of the Department of Health and Herefordshire PCT that the MMR vaccine provides the best protection possible to children, and the PCT will do all that it can to ensure that uptake rates are maximised. The uptake levels are routinely monitored, and results will be published in the DPH report each year.

References

(1) Wakefield A.J. et al (1998) 'Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children' The Lancet 351: 637 - 41

(2) Wakefield AJ and Montgomery SM (2000) 'Mumps, measles, rubella vaccine: through a glass darkly' Adverse Drug Reactions and Toxicological Reviews 19: 265 – 83.

(3) Medical Control Agency/Department of Health (2001) 'Combined measles, mumps and rubella vaccines@ Adverse Drug Reactions and Toxicological Reviews 19: 4).

(4) Madsen KM et al (2002) 'A population based study of measles, mumps and rubella vaccination and autism.' New England Journal of Medicine 347: 1477 – 82.

(5) Makela et al (2002) 'Neurologic disorders after measles-mumps-rubella vaccination.' Pediatrics 110: 957-63.

(6) Wilson K et al (2003) 'Association of autism spectrum disorder and the measles, mumps and rubella vaccine.' Archives Pediatric and Adolescent Medicine, 157: 628-34.

(7) Barbaresi et al (2005) 'The incidence of autism in Olmsted County, Minnesota 1976-1997. Archives of Pediatric and Adolescents Medicine, 159: 37-44.

(8) Demicheli V et al (2005) 'Vaccines for measles, mumps and rubella in children (review)' http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD004407/frame.html

Websites

Two websites of interest, which provide further links to more sites, are www.immunisation.nhs.uk, and www.mmrthefacts.nhs.uk.