Policies for public health management of meningococcal disease

The article in this edition of the journal by Ardern and colleagues illustrates many of the difficulties in formulating and applying guidelines for the control of meningococcal disease.

The first problem is the lack of an evidence base. The only published study to support the use of chemoprophylaxis as a control measure was an unblinded, observational study that demonstrated a lower secondary attack rate among household contacts of meningococcal disease who were given rifampicin, minocycline or sulpha prophylaxis, when compared with households where prophylaxis was not given. The difference in attack rates between the two groups failed (just) to reach statistical significance.2 There are no published studies assessing the efficacy of chemoprophylaxis in preventing secondary cases among non-household contacts. It would be virtually impossible to conduct such studies now, given the very low secondary attack rates in non-household settings and the ethical objections that would be raised by the need to withhold prophylaxis from a control group.

The efficacy of polysaccharide meningococcal vaccines in halting outbreaks has been amply demonstrated for serogroup A disease, particularly in the meningitis belt of Africa. The data for serogroup C vaccine are, in contrast, scanty. The efficacy of serogroup C vaccine was first established in US military recruits, however the only subsequent efficacy study in an outbreak situation was in Brazil, where children aged 6 to 36 months were randomised to receive meningococcal C vaccine or diphtheria and tetanus toxoid. The serogroup C vaccine was not effective in children under 24 months and only 52% effective in those aged 24–36 months.2

This lack of evidence base means that guidance is empirical, or based on secondary evidence, such as the relative risk of transmission in different settings, and the efficacy of antibiotic prophylaxis in eradicating nasopharyngeal carriage. There is nevertheless considerable concordance between the UK guidelines and those of other countries. Notable areas of divergence are that the UK guidelines recommend vaccination of household contacts of serogroup C cases to prevent late secondary cases, whereas guidelines in other countries do not recommend this measure; some countries (US, Canada, Holland) set attack rate thresholds for vaccination in community wide outbreaks (the UK does not); Norway has a policy of giving pencillin to household contacts in an effort to treat potentially incubating disease (no other country recommends this measure).

The second problem is the pressure that the media can bring to bear. Meningococcal disease is a highly emotive subject, and every case is a potentially newsworthy event in the UK. Most doctors do not fully understand the rationale for chemoprophylaxis and vaccination, so it is hardly surprising that the media are even less well informed. In practice it is much more probable that transmission is through social networks outside the school, with the school cases merely reflecting what is happening in the wider community. Carriage surveys are sometimes done (as in Ardern’s paper) in an effort to reassure parents, however nasopharyngeal carriage is a poor predictor of meningococcal disease, especially for serogroup C clusters where high attack rates can be observed despite very low carriage rates. Current phenotypic typing methods for meningococci are often inconclusive, because of the high proportion of non-groupable and non-typable strains, and cannot provide sufficient discrimination between strains in time for decisions on public health action.

What are the prospects for improving our management of these incidents? Improved conjugate serogroup C vaccines will soon be introduced into the UK immunisation schedule. The most probable scenario is a routine infant programme, with a catch up campaign in pre-school and school age children. This should quickly reduce the number of clusters in educational settings—serogroup C strains currently account for about 40% of cases, and more than 50% of clusters in the UK. Clusters of serogroup B disease will however continue to occur, and in some incidents there will be no microbiological diagnosis, which will raise concerns about vaccine failure. An effective serogroup B vaccine is unlikely to be available for at least five years. A promising innovation is improved typing for discriminating outbreaks strains. These are DNA-based methods, such as multilocus sequence typing, which can determine the genetic relation between strains in less than 24 hours.3 They should be available as a routine service within the next two years.

Ardern and colleagues argue for more efforts to raise public awareness. I agree, and would add the need to educate health professionals, especially GPs, who can make the management of incidents more difficult by indiscriminate prescribing of antibiotic prophylaxis to worried patients outside the close contact network. Tackling the media hype is much more difficult. An outbreak of meningococcal disease, real or perceived, will always be newsworthy. The art of managing an outbreak is managing the information. The science is less than perfect, but fortunately vaccination will probably eliminate the disease before we fully understand it.

NORMAN BEGG