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Infection

MRSA: the problem reaches paediatrics

J W Gray

Commentary on the paper by Khairulddin *et al*

The pattern of MRSA in UK hospitals nowadays is very different to that seen a decade or so ago. Then, MRSA was confined mainly to a relatively small number of hospitals in the southeast of England and some of the large provincial conurbations.[1] However, new strains of epidemic MRSA, especially EMRSA-15 and EMRSA-16, have since emerged and spread to become established to some extent in virtually every hospital in the country.[1] Between 1992 and 2002 the proportion of blood culture isolates of *Staphylococcus aureus* reported by microbiology laboratories to the Communicable Disease Surveillance Centre that were methicillin resistant increased from 3% to 43%.[2] The pervasiveness of MRSA is underlined by the fact that MRSA now accounts for over 30% of *S aureus* bacteraemias in every health care region in England, Wales, and Northern Ireland.[3]

MRSA are frequently not only resistant to methicillin and other β-lactam antibiotics, but to other classes of antibiotics as well.[1] The glycopeptide antibiotics teicoplanin and vancomycin are currently the mainstay of treatment of infections with MRSA.[1] However, strains of MRSA have emerged that exhibit higher than usual minimum inhibitory concentration values for these antibiotics: glycopeptide-intermediate *S aureus* (GISA), or vancomycin resistant *S aureus* (VISA).[4] Although not fully glycopeptide resistant, infections with these isolates often respond poorly to treatment with these agents. Fortunately only a small number of infections with these bacteria have been reported so far. Nevertheless, they present a considerable threat for the future.

MRSA has been considered to be less of a problem in children, and indeed it is sometimes suggested by non-paediatric microbiologists that children may be less susceptible to colonisation or infection with MRSA. However, this seems unlikely, given the ubiquity of *S aureus* as a childhood pathogen. It is much more likely that the lower incidence of MRSA in children relates to demographic and epidemiological differences. A relatively small proportion of children receive in-patient hospital treatment, which is the most important risk factor for acquisition of MRSA.[1] Paediatric units tend to be relatively independent of adult services, and to have better provision of isolation facilities, so that even in hospitals with a high prevalence of MRSA it is possible for paediatric services to be relatively unaffected.[5]

> ''There is an increasing incidence of healthcare associated infections with MRSA in children with underlying conditions predisposing to infection with *S aureus*''

However, the situation in children may be changing. There was a recent report in this journal of an increasing incidence of MRSA in children in Leeds with cystic fibrosis,[6] and in this issue, Khairulddin and colleagues[7] report that the proportion of bacteraemias with *S aureus* in children in England and Wales that were due to MRSA increased from 0.9% to 13.1% between 1990 and 2000. Also, Arkwright and colleagues[8] have recently reported an age related increase in MRSA prevalence in children in Manchester with atopic dermatitis. Neonatal units are another area of concern, with several reported MRSA outbreaks that have been difficult to control and associated with considerable morbidity.[9 10] What all of these studies point to is an increasing incidence of healthcare associated infections with MRSA in children with underlying conditions predisposing to infection with *S aureus*. At the same time, recent data from the USA indicate that MRSA accounts for up to 60% of community acquired infections with *S aureus* presenting to hospitals.[11–15] Many of these cases occurred in children with few or no risk factors for acquisition of MRSA, suggesting that MRSA is circulating among children in those communities.[11 12 14 15]

The emergence and spread of MRSA in children is of considerable concern, because *S aureus* is a major paediatric pathogen, both in hospitals and in the community. In hospitals, aside from the fact that infections with MRSA are expensive and inconvenient to treat, MRSA tends to occur as an additional pathogen, rather than replacing methicillin sensitive *S aureus* (MSSA).[1] Thus when MRSA becomes established in a hospital, the overall burden of health care associated infections tends to increase. The occurrence of MRSA among children in the community could mean that common childhood cutaneous infections such as impetigo would begin to present a real therapeutic challenge, with few, if any, options for oral or topical therapy.[16]

> ''There should still be an opportunity to halt, and even reverse, the current increase in MRSA in children''

Recent data on MRSA in children suggest that paediatrics may be where adult practice was in the mid 1990s. If that is so, then there should still be an opportunity to halt, and even reverse, the current increase in MRSA in children. First, we need more information on the current extent of the problem.

The studies referred to earlier in this commentary point to an increasing incidence of MRSA in children having hospital contact in the UK. We can take some encouragement from the fact that the incidence of MRSA bacteraemia in the specialist Children's Hospital Trusts in England is low,[17] but there are no similar data for neonatal or paediatric units in other Trusts, which provide the bulk of children's services. We have even less information on the occurrence of MRSA in the community in the UK, although most of us will have anecdotal experience of seeing cases where there are no apparent risk factors.

Second, appropriate measures for control of MRSA in children must be considered. Strenuous efforts to ascertain and eliminate possible sources of MRSA, including actively seeking and treating carriers, have repeatedly been shown to be effective in preventing spread of MRSA.[1 5] Guidelines produced jointly by the British Society for Antimicrobial Chemotherapy, the Hospital Infection Society, and the Infection Control Nurses Association give comprehensive advice on the investigation of cases of MRSA.[1] While many of the recommendations are applicable to children, there is no special consideration of paediatrics. Non-neonatal paediatrics is defined as a low risk specialty, the implication being that in hospitals where MRSA is endemic, pursuance of MRSA positive children may need to be less vigorous. This is indeed likely to be the case in many hospitals, where infection control teams are stretched and have no special interest in paediatrics. While guidance is provided on staff screening in response to cases of MRSA in patients, there is no reference to pre-emptive screening of newly appointed clinical staff. However, in this author's experience, nosocomially acquired MRSA in children is often related to new staff carrying MRSA acquired at other hospitals. As a result, all new clinical staff at Birmingham Children's Hospital in specialties such as neonatal and paediatric intensive care, neonatal surgery, and cardiac services are routinely screened for MRSA. The guidelines also do not cover specific paediatric issues such as education and play services, toys, and the management of family members of children with MRSA, who may themselves become transiently or permanently colonised, and who may be using hospital kitchen facilities, or occupying hospital accommodation.

As Khairulddin and colleagues[7] point out, there is an urgent need for a national review of MRSA in children, both to establish the extent of the current problem, and to implement infection control measures that can better control MRSA in neonatology and paediatrics.

Arch Dis Child 2004;**89**:297–298.
doi: 10.1136/adc.2003.045534

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Cystic fibrosis

Intravenous immunoglobulin for cystic fibrosis lung disease

R L Smyth

Commentary on the paper by Balfour-Lynn *et al*

In a retrospective review published in this issue,[1] Balfour-Lynn and colleagues describe 16 children with cystic fibrosis (CF) who appeared to show clinical improvement following regular infusions of intravenous immunoglobulin (IVIG). They have not described any criteria for the commencement of treatment, but the majority of children had previously been diagnosed with allergic bronchopulmonary aspergillosis (ABPA). An analysis of efficacy compared lung function and other concomitant treatments before starting therapy and after courses of therapy, the number of which varied considerably between patients. This treatment was associated with a reduction in the doses of oral and inhaled steroids. There was some improvement in forced vital capacity, but no difference in forced expiratory volume in one second.

Clinical practice has been likened to an experiment, where a patient presents with a problem, treatment is initiated, and the results of treatment are later assessed and conclusions drawn about whether or not the treatment is effective. There are a number of factors