■ EDITORIAL

The value of routine screening of staff for MRSA

**A. H. R. W. Simpson,
J. Dave,
B. Cookson**

*From The
Department of
Orthopaedics and
Pathology,
Edinburgh Royal
Infirmary,
Edinburgh, and the
Health Protection
Agency, London*

■ A. H. R. W. Simpson, FRCS(Ed & Eng), DM(Oxon), MA(Cantab), Professor
Department of Trauma & Orthopaedics
Edinburgh University,
Edinburgh Royal Infirmary,
Little France,
Edinburgh EH16 4SU, UK

■ J. Dave, FRCPath, MD, MBA,
Consultant Microbiologist
Lothian University Hospitals
Division
Edinburgh Royal Infirmary,
Little France, Dalkeith Road,
Edinburgh EH16 4SU, UK.

■ B. Cookson, FRCPath, FRIC,
FRCPath, Director
Laboratory of Healthcare-
Associated Infection, Centre for
Infections, Health Protection
Agency
61 Colindale Avenue, London,
NW9 5EQ, UK.

Correspondence should be sent
to Professor A. H. R. W.
Simpson; e-mail:
hamish.simpson@ed.ac.uk

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In this issue, Kaminski et al¹ describe the findings of their study in which 324 asymptomatic healthcare workers were screened in order to establish whether they were carrying methicillin-resistant *Staphylococcus aureus* (MRSA) in the nose or the throat. If they were positive, a programme of eradication was carried out.

The authors found MRSA in 17 (5.3%) of the healthcare workers. In six (1.8%), colonisation was transient. The remaining 11 (3.4%) underwent a programme of eradication which was successful in all of them. Although not addressed in the paper itself, it is important to note that staff should not be screened while on duty, otherwise repeated transient colonisations may be misinterpreted as permanent.²

The screening of healthcare workers for carriage of MRSA remains controversial, as the role of such detection in the colonisation and infection of patients is unclear. Screening of staff is time-consuming and costly, requiring the use of laboratory resources. The results of an MRSA screening programme have considerable emotional implications for the staff who test positive, with issues of confidentiality, the possible threats to their future employment, and litigation which might ensue.

Interestingly, Kaminski et al managed to eradicate MRSA in all the staff who tested positive in their hospital. As a result, none had to look for alternative employment. The experience in a Dutch university hospital³ was not as successful. The levels of MRSA are much lower in the Netherlands and the policies in place require healthcare workers to seek alternative employment despite being asymptomatic.² The benefits of screening are therefore questionable, particularly considering that there is little evidence to suggest that the exclusion of MRSA-positive workers improves the overall control of MRSA.

Lessing, Jordens and Bowler⁴ described nine outbreaks of MRSA over a period of 27 months. In only two of these was it likely that the transfer was from a member of staff, and in

both it was from the same healthcare worker. However, a total of 22 staff members were found to have tested positive. They concluded that it was necessary for staff screening to be to the "absolute minimum"⁴ to achieve control. Cox and Conquest⁵ also considered that screening patients was far more beneficial than screening staff.

Colonised staff who are detected by large-scale screening programmes are usually victims as opposed to perpetrators. Such investigations may be helpful, however, in areas where there are well-defined outbreaks. These include surgical wards and intensive care units in hospitals with a low prevalence of MRSA, where the testing of the patients has not revealed a source. Two or more new cases of MRSA in the intensive care unit may constitute an outbreak in which the infection control team might consider screening staff. In such circumstances, targeted screening of staff with exfoliative lesions of the skin or paronychia may be appropriate. However, in hospitals where the prevalence of colonisation of patients with MRSA is high, some degree of colonisation is inevitable as the staff will be constantly exposed to the organism. In these situations staff should not be subjected to widespread screening, because it is of unproven benefit in controlling outbreaks and brings with it stigmatisation, decolonisation, and potential long-term difficulties in their career.

Staff who have tested positive for MRSA and who have not responded to a programme of topical or systemic eradication need to have detailed work-ups to ensure that full measures are taken to eradicate their carriage.⁶ Where persistent colonisation continues, the unfortunate issue of a change in career must be addressed. If there are epidemiological data indicating that a particular healthworker is implicated in new acquisitions of MRSA by patients, an alternative career in medicine which requires minimal contact with patients should be explored. Where no such association can be found the risks of transmission need to

be assessed in detail with the infection control team and occupational health physicians, so that possible solutions can be developed and monitored.

The United Kingdom guidelines⁷ for the control and prevention of MRSA in healthcare facilities suggest screening of patients in areas of high risk. If new cases are identified, staff should be asked whether they have any skin lesions. Staff screening is suggested if an 'outbreak' occurs, and also if transmission on the ward continues despite measures to control it. Defining an outbreak can be problematic as a result of the endemicity (the number of MRSA patient readmissions and transfers from other hospitals), the lengths of hospital stay, and the intensity of clinical sampling. Each unit would have to define an outbreak based on these factors and the baseline levels of MRSA in the unit. In a strictly enforced 'search and destroy' policy for MRSA, any new cases would constitute an outbreak. However, the hospital would need to monitor the cost-effectiveness of such a policy regularly. If a new cluster of MRSA cases is identified despite measures taken to control infection, a multi-disciplinary review group would need to reconsider screening staff among their other measures.

How does this apply to orthopaedic procedures? These are high-risk operations, and the measures taken will depend on the endemic rates of MRSA. In the United Kingdom, the Saving Lives programme of the Department of Health includes advice on screening.⁸ Many hospitals now screen and clear elective orthopaedic patients before admission, and screen and decontaminate high-risk acute admissions until the results of screening are known. Risk factors for the acquisition of MRSA include previous hospital admissions, admission from nursing homes, contact with MRSA, or a previous history of MRSA. Ideally, patients undergoing elective surgery for total hip replacement should be segregated from other patients, and those in this group with MRSA should also be segregated from other patients. There is evidence that antimicrobial prophylaxis does reduce deep infection after total joint replacement,^{9,10} and in the event of a confirmed outbreak with MRSA, prophylaxis with vancomycin is logical. The benefit of laminar flow theatres in these situations is more controversial. Lidwell et al¹¹ clearly demonstrated a reduced rate of infection after surgery in ultraclean theatres, although antibiotic prophylaxis was a confounding variable in their study. However, it is important to remember that, in certain circumstances, theatre personnel can actually increase the rates of infection in laminar flow theatres.¹²

The results of Kaminski et al's study are of interest, but it should be borne in mind that programmes for staff screening are expensive and that evidence that they contribute to the control of most outbreaks of MRSA is minimal. Transient carriage of MRSA by staff is common and acquisition of MRSA by patients can be reduced by good hand hygiene and compliance with other measures of infection control.^{2,13} The key issue of whether their intervention had any impact on local infections or acquisition of MRSA was outside the scope of the paper by Kaminski et al. The evidence for the effectiveness of interventions in the control of infection needs to be confounded, and we encourage the adoption of the ORION (Outbreak Reports and Intervention Studies of Nosocomial infection) approach when considering studies to test the effectiveness of measures for the prevention and control of MRSA.¹⁴

References

1. Kaminski A, Kammler J, Wick M, Muhr G, Kutscha-Lissberg F. Transmission of methicillin-resistant *Staphylococcus aureus* among hospital staff in a German trauma centre: a problem without a current solution? *J Bone Joint Surg [Br]* 2007;89-B:642-5.
2. Cookson BD, Peters B, Webster M, et al. Staff carriage of epidemic methicillin-resistant *Staphylococcus aureus*. *J Clin Micro* 1989;27:1471-6.
3. Blok HE, Troelstra A, Kamp-Hopmans TE, et al. Role of healthcare workers in outbreaks of methicillin-resistant *Staphylococcus aureus*: a 10-year evaluation from a Dutch university hospital. *Infect Control Hosp Epidemiol* 2003;24:679-85.
4. Lessing MPA, Jordens JZ, Bowler ICJ. When should healthcare workers be screened for methicillin-resistant *Staphylococcus aureus*? *J Hospital Infection* 1996;34:205-10.
5. Cox RA, Conquest C. Strategies for the management of healthcare staff colonized with epidemic methicillin-resistant *Staphylococcus aureus*. *J Hosp Infect* 1997;35:117-27.
6. Cookson BD. Tonsillectomy and MRSA carriage. *J Hosp Infect* 2005;61:176-7.
7. Coia JE, Duckworth GJ, Edwards DJ, et al. Guidelines for the control and prevention of methicillin-resistant *Staphylococcus aureus* (MRSA) in health care facilities. *J Hosp Infect* 2006;63:1-44.
8. No authors listed. Screening for methicillin-resistant *Staphylococcus aureus* (MRSA) colonisation: a strategy for NHS trusts: a summary of best practice. http://www.dh.gov.uk/en/PublicationsandStatistics/Publications/PublicationsPolicyAndGuidance/DH_063188 (date last accessed 10 May 2007)
9. Fitzgerald RH Jr. Total hip arthroplasty sepsis-prevention and diagnosis. *Orthop Clin North Am* 1992;23:259-64.
10. Hirschmann JV. Antibiotics in the prevention of infection associated with prosthetic devices. In: Sugarman B, Young EJ, eds. *Infections associated with prosthetic devices*. Boca Raton: CRC Press, 1984:269-78.
11. Lidwell OM, Elson RA, Lowbury EJ, et al. Ultraclean air and antibiotics for prevention of postoperative infection: a multicentre study of 8,052 joint replacement operations. *Acta Orthop Scand* 1987;58:4-13.
12. Salvati EA, Small RD, Brause BD, et al. Infections associated with orthopaedic devices. In: Sugarman B, Young EJ, eds. *Infections associated with prosthetic devices*. Boca Raton: CRC Press, 1984:181-218.
13. Teare EL, Stone S, Cookson B. Hand hygiene. *Brit Med J* 2001;323:411-12.
14. Stone SP, Cooper BS, Kibbler CC, et al. The ORION statement: guidelines for transparent reporting of outbreaks, reports and intervention studies of nosocomial infection. *J Antimicrob Chemother* 2007;59:833-40.