

infection. Indeed, changes in the use of antibiotics have been implicated in exacerbating or even causing the problem of methicillin resistant *S aureus*.

Much remains to be done in evaluating the clinical importance of methicillin resistant *S aureus* and recommended control measures. In the interim, infection control should be based on strictly enforced measures to control hospital infection, encompassing good hygiene practices among staff, thorough cleaning of patients' environment, and a prescribing policy that restricts the use of antibiotics.

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## Infection spreads between hospitals

EDITOR,—In response to Georgia J Duckworth's article on infection with methicillin resistant *Staphylococcus aureus*<sup>1</sup> we wish to describe our surveillance programme for the infection and some of the containment procedures that are practised in the Netherlands. In the 1980s hospital epidemics of infection with methicillin resistant *S aureus* were documented in the Netherlands after patients were transferred from foreign hospitals.<sup>2</sup> Attention was thus drawn to the possibility of spread of the organism between hospitals. In 1989 the National Institute of Public Health and Environmental Protection in Bilthoven set up a nationwide surveillance programme for methicillin resistant *S aureus*. Isolates of the organism from Dutch hospitals were collected for four years (1989-92) along with data on their origin(s), phage types, antibiograms, and propensity for epidemic spread.

A questionnaire was sent to the hospitals to determine the origin of the isolates: a foreign country, the Netherlands, or not known. During this period, 721 isolates were received from 91 hospitals. Of these 721 isolates, 491 from 116 different admissions originated in 26 countries, while 167 seemed to have originated in the Netherlands: these may have been either selected or indigenous strains.<sup>3</sup> The origin was unknown or not reported for 63 isolates.

Patients admitted to a Dutch hospital after an admission of more than 24 hours to a hospital abroad were isolated and screened for methicillin resistant *S aureus*. Colonisation or infection, or both, with the organism was usually detected within one week after admission. Isolation was discontinued only after repeated cultures for the organism yielded negative results. Spread of the organism to these patients within the Dutch hospital could therefore be excluded. Despite containment and screening procedures, however, epidemic spread to other patients and staff occurred with some "imported" strains. For example, one phage type designated III-29 originated in France (nine admissions), Spain (three), Portugal (two), Germany (two), and Belgium (one) and caused epidemics after its introduction, being responsible for 79 of the 114 isolates of III-29.

As well as the hygienic and isolation policies discussed by Duckworth, screening for methicillin

resistant *S aureus* in transferred patients has been recommended by the Dutch government since the late 1980s.<sup>4</sup> Awareness of the possibility of the introduction of the organism is further enhanced by mailings from the Ministry of Health and local infection committees, especially before holiday periods. Furthermore, hospitals are notified of the intended transfer of a patient by the organisations engaged in repatriating patients to the Netherlands.<sup>5</sup> Good communication between infection control doctors remains warranted when patients positive for methicillin resistant *S aureus* travel between hospitals. In this way the organism has been kept under control in the Netherlands. This is confirmed by a low prevalence of methicillin resistance (0.54% in 27 127 isolates of *S aureus*) found in another surveillance programme conducted by the National Institute of Public Health and Environmental Protection from 1990 to 1992 (A J de Neeling, personal communication).

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## Nursing homes act as reservoir

EDITOR,—In her review of methicillin resistant *Staphylococcus aureus* Georgia J Duckworth states that this heterogeneous group of organisms is largely found in hospitals.<sup>1</sup> Her recommendation, and earlier guidance,<sup>2</sup> is for patients to be discharged early to the community whenever possible. As Duckworth indicates, screening methods used are insensitive, and even if patients are deemed clear of colonisation methicillin resistant *S aureus* may be detected after a few weeks. Persistent, long term carriage of some strains by asymptomatic people living in the community has been reported.<sup>3</sup>

Many of the patients in British hospitals colonised by methicillin resistant *S aureus* are elderly and will be discharged to residential or nursing homes.<sup>4</sup> In the United States it has been recognised for several years that nursing homes may serve as reservoirs for the organism in the community.<sup>5</sup> We observed small outbreaks of the strain EMRSA-15 first in orthopaedic wards and then in wards for care of the elderly in Bradford in the late 1980s and subsequently found the same strain in patients admitted to hospital from the community, particularly from nursing homes. Follow up of contacts of one patient admitted from a nursing home showed six of 43 residents to be colonised by the same strain. We have now observed methicillin resistant *S aureus* in patients admitted from nursing homes to hospitals in Leeds.

At the instigation of one of us (BG) a policy document, *Guidance for the Control of Infection in Private Residential and Nursing Homes*, has been produced by Yorkshire Regional Health Authority. This document provides information and guidance to proprietors and matrons of homes and to officers

of health authorities who register and inspect homes. Because of particular concern about methicillin resistant *S aureus* in these units educational sessions covering this topic have been organised for staff of nursing and residential homes in Leeds.

Although the risk of serious infection with these organisms in residents is low, the reintroduction of methicillin resistant *S aureus* from nursing and residential homes to acute hospitals is a continuing problem in some areas of Britain. The potential threat of this should be emphasised in guidance documents.

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## Author's reply

EDITOR,—I believe that Parukutty Nair and John Henderson are incorrect in several factual matters and that their comments are misplaced in the light of current experience. The recommendations in my review are based on those of the combined working party of the Hospital Infection Society and the British Society for Antimicrobial Chemotherapy, which was asked to advise on the growing problem of epidemic methicillin resistant *Staphylococcus aureus* on two separate occasions<sup>1,2</sup> and is convening again to address the issue of methicillin resistant *S aureus* in the community.

Screening will detect colonised patients, but true infections are an important part of the problem and may be serious.<sup>3,4</sup> In 11 years' experience of over 1000 patients with an epidemic strain of methicillin resistant *S aureus* (EMRSA-1) at a London teaching hospital, I found that three quarters of the isolates were from patients with infections. The response to antibiotics depends on the infection. Glycopeptides may not be successful in the treatment of endocarditis or meningitis due to methicillin resistant *S aureus*, even in combination with other agents.

The statement that methicillin resistant *S aureus* is not more virulent than methicillin sensitive strains is meaningless as this depends on the strains being compared. Methicillin resistant strains can be as virulent as methicillin sensitive strains.<sup>5</sup>

Multiresistance in *S aureus* tends to be more important than that in *Pseudomonas aeruginosa* because *S aureus* can also be spread through the air. In an outbreak due to multiresistant *P aeruginosa* screening may be required. There is debate about appropriate control measures for enterococci resistant to vancomycin.

Spread is probably unlikely with nasal colonisation alone, while the reverse is true if eczema becomes colonised. Sporadic infections are probably endogenous, but person to person transmission occurs in an outbreak.

Clearance of methicillin resistant *S aureus* is difficult if there is a persistent wound or abnormal skin. Apparent relapses may reflect lack of clearance, subsequent exposure to antibiotics, or reacquisition.

Elimination of carriage with systemic antibiotics is not routinely recommended but is sometimes