Methicillin-resistant *Staphylococcus aureus* in Skin Disease Affects Mainly Elderly Patients with Eczema and Leg Ulcers who have Associated Chronic Disease

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Sir,

Methicillin-resistant *Staphylococcus aureus* (MRSA) emerged in the 1960s and has had a huge impact on patients' health worldwide (1). MRSA worsened in the mid-1990s when epidemic strains became established in hospitals throughout the UK and elsewhere. These strains are easily transmissible, have the capacity to cause serious disease, and represent over 40% of the *S. aureus* causing bloodstream infections (1). Several steps can be taken to reduce transmission of healthcare-associated MRSA (HA-MRSA) and community-acquired MRSA (CA-MRSA) (1).

Women are more likely to have MRSA colonization than men (2, 3), although the age-standardized rates for deaths involving for 10 years to 2004 due to *S. aureus* and MRSA were higher in males (Office of National Statistics: http://www.statistics.gov.uk). MRSA colonization is more common in those aged 65 years or older (2, 3) and mortality from *S. aureus* or MRSA is higher in elderly people. Hispanic people are statistically at less risk of MRSA than white persons (3). In the UK, most MRSA from bacteraemia belong to two clones: EMRSA-15 (ST22-MRSA-IV, in new nomenclature) and EMRSA-16 (ST36-MRSA-IV) (2). In 2001, 95% of MRSA reported from 26 hospitals to the EARSS causing bacteraemia, belonged to either EMRSA-15 (60%) or EMRSA-16 (35%) (4). EMRSA-15 is most commonly associated with hospital-acquired MRSA infections.

The most common skin diseases associated with MRSA are skin ulcers and chronic dermatoses such as eczema (5–7). The increased risk among patients with skin ulcers might be associated with diabetes, which is associated with MRSA colonization (3, 8). Other risk factors include: underlying chronic disease (9, 10), previously hospitalization (5), long-term care, and contact with healthcare workers (3).

This study examined the characteristics of MRSA infections associated with skin disease and reviewed treatment and prognosis.

MATERIALS AND METHODS

A retrospective review was conducted of patients with skin disease who had a positive bacterial skin swab for MRSA. A list was compiled of the patients who tested positive for MRSA and attended the dermatology outpatients or inpatient ward of the Royal Hallamshire Hospital, Sheffield, UK, between January 2004 and December 2005. In this period 58,585 patients were seen in the department.

Patient medical and infection control records were studied to determine the following: gender, age, ethnic group, dermatological disease, primary or secondary skin infection, MRSA phage type, underlying chronic illness, diabetes, previous hospital contact, long-term care, outpatient or inpatient, follow-up of outpatients and inpatients, anti-MRSA measures used in outpatients and inpatients, treatment of inpatients and outpatients. These criteria were chosen because they were important in the demography, predisposition to and treatment of MRSA. The audit was registered with the hospital audit office.

A total of 42 patients were identified, of whom 21 were evaluable. Primary MRSA infections were defined as those occurring on apparently normal skin and include impetigo, folliculitis, furuncles, sycosis barbae, cellulitis, abscesses, paronychia and whitlows. Secondary MRSA skin infections are those occurring on damaged traumatized skin, or in the context of a pre-existing skin disease. A chronic illness was defined as one that has lasted for 3 months or more and included diabetes, chronic obstructive airways disease, chronic cardiac failure, and asthma. Previous hospital contact was defined as contact with a hospital within one year of the first positive MRSA isolate; long-term care was categorized as living in a nursing home or care home, or being nursed continually at home. To be clear of MRSA, three negative swabs were required.

RESULTS

Seventeen (81%) of the 21 patients were aged 60 years or more, with 8 (38%) in the 70–79 decade. There were 13 women and 8 men. Ethnic origin was as follows: 16 white, 2 Asian, 1 black, 2 not known. This is what might be expected from the ethnic make-up of Sheffield (http://www.statistics.gov.uk). Twenty of 21 MRSA skin infections were MRSA 15. None were MRSA 16. In one the phage type was unknown. Thirteen patients attended outpatients, 8 had been inpatients.

In 20 patients, the MRSA infected a pre-existing skin disease; in only one was there a primary skin infection with MRSA (Table I). In 16 patients there was the comorbidity of a chronic disease – diabetes in 6, (type 2 in 4, type 1 in 2). In 17 cases, there was a history of contact with a hospital in the previous year. Seven were in long-term care.

Infection control records were compared with hospital notes to determine whether patients had follow-up sufficient to eradicate MRSA. The infection control records show that measures were taken in 2 of 13 outpatients, no measures were taken in 7, and in the other 4 it was unclear if any measures were taken. The hospital records show that measures were taken in 9 patients. It was unclear if measures were taken in the other 4.

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Table I. *Nature of methicillin-resistant Staphylococcus aureus (MRSA) infection in 21 patients with skin disease*

Nature of infection	*n*
Impetigo	1
Eczema/dermatitis	7
Leg ulcer	7
Wound infection	3
Erythroderma	2
Bullous disease	1

In 5 outpatients, follow-up swabs were taken, but in no case were three negative swabs obtained. For the 8 inpatients, infection control records show that measures were taken in 4, and in 4 it was unknown what measures had been taken. Hospital notes show that in 6 cases, measures had been taken (in 2 they were not). In 6 of 8 inpatients, follow up swabs were taken and in 5 cases, 3 clear swabs were obtained.

DISCUSSION

These results confirm previous findings. The female preponderance of MRSA corresponds with the results of others (2, 3). The finding that most patients are elderly mirrors previous experience (2, 3). As expected, the most common MRSA phage type was EMRSA-15, which is usually associated with hospital-acquired infection (2, 4). There were no cases of CA-MRSA-16. HA-MRSA is still the predominant source of infection in patients with skin diseases infected with MRSA.

We confirm that eczema and leg ulcers are the skin diseases most likely to be secondarily infected with MRSA (5). Our findings that three-quarters of patients had a chronic disease, a third had diabetes and a third were in long-term care, confirms these as important risk factors (2, 3, 8). Experience suggests that MRSA in diabetic foot ulcers is an increasingly difficult problem (11).

Skin carriage of *S. aureus* and clinical infection is frequent in atopic dermatitis. In one series, carriage was found in the anterior nose in 22% and in the flexures in 58% of 55 children with atopic dermatitis (12). Other authors have found higher levels of colonization with *S. aureus*: Higaki and colleagues (13) detected positive cultures in 87% of patients with moderate atopic dermatitis, in 100% of those with severe disease, and in 25% of controls without eczema. In one series, MRSA was cultured from the skin of 31% of patients with infected atopic dermatitis (14).

Although anti-MRSA measures were being put into practice, efforts should be improved. Follow-up of outpatients showed that no patient had three negative swabs, suggesting that they were not cleared of MRSA and could be spreading it within the community. For inpatients, 5 had three negative swabs and were clear of the MRSA. Infection control mechanisms have been the focus of much debate; some authors recommend active surveillance cultures of high-risk patients and strict adherence to barrier precautions as methods to reduce the risk (15). More attention should be focused on outpatients with MRSA in order to eradicate the infection and prevent its spread through the community.

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