A survey on public knowledge and perceptions of methicillin-resistant Staphylococcus aureus

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Objectives: The aim of the study was to establish knowledge and understanding of methicillin-resistant Staphylococcus aureus (MRSA) among patients, visitors and members of the general public accessing health services and to identify public education needs in relation to MRSA.

Participants and methods: Survey participants were recruited through 15 general practice surgeries across Tayside and through a young people’s health and information project in Dundee city centre and at a health information facility at Ninewells Hospital and Medical School, Dundee.

Results: There were 1000 responses. The majority (86%) had heard of MRSA, 59% knew that it is a bacterium and 47% were aware that a healthy person can have MRSA without feeling ill. Those who knew someone who had had MRSA (32%) showed greater knowledge but greater worry about getting MRSA if admitted to hospital. Knowledge of possible treatments was variable, with 7% of respondents thinking of MRSA as untreatable. Across all groups, most estimates of MRSA prevalence were much higher than actual prevalence.

Conclusions: Public awareness of MRSA and its treatment was higher than expected, mainly gained through the media, but with considerable gaps in knowledge. Knowing someone with MRSA makes the individual more likely to be knowledgeable about MRSA in general, but more likely to think it is untreatable and almost twice as likely to be worried about contracting MRSA if admitted to hospital. The findings of this survey will inform the development of educational packages for the general public, as well as patients entering hospital and their visitors.

Keywords: hospital infection, awareness, patient education

Introduction

In Scotland, a national survey estimated the prevalence of healthcare-associated infections, defined as any infection that occurs 2 days or more after a patient has been admitted to hospital,1 to be 9.5% for patients in acute hospitals and 7.3% in non-acute hospitals.2 Although methicillin-resistant Staphylococcus aureus (MRSA) infection may be acquired in the community, this is thought to be rare in the UK3 and it remains primarily a hospital-associated infection.

The incidence of MRSA infection is likely to be multifactorial in origin, partly due to substandard infection control practices4,5 and partly due to the natural colonization of patients’ skin or noses.6 A recent study of admissions to hospitals in Oxfordshire found that a quarter of hospital MRSA cases occur in patients who have previously been admitted to hospital.7 This highlights the need to raise awareness and knowledge among inpatients, their visitors and the general public about their role in infection control.

Research focusing on the social representations of MRSA through media coverage reported that MRSA is represented as a potentially lethal superbug and its spread attributed to poor hygiene in hospitals.8 However, there has been, to date, relatively little evaluation of the general public’s knowledge and perception of MRSA. There is some evidence of mistaken beliefs about MRSA; despite estimates that less than 1 in 1000 people in hospital will get a serious MRSA infection, there is a misconception that it is a considerable threat.9 Previous research
on the topic has focused on small groups of patients10–13 or healthcare staff.14

The purpose of our study was to target a much larger and broader group. Knowledge of levels of public awareness of MRSA would inform healthcare providers of educational needs of patients and, most importantly, those most vulnerable to infection. Knowledge and awareness among patients would help foster realistic expectations about infection and enable people to make a contribution to efforts to reduce MRSA incidence and spread.

Participants and methods

A questionnaire was developed to establish public awareness of MRSA and its nature, perceived estimates of MRSA incidence, knowledge of MRSA transmission and the public’s sources of information on MRSA. The questionnaire was piloted with members of the public to check for comprehension and ambiguity of the questions, and the survey was carried out between October 2006 and June 2007. The questionnaire is available as Supplementary data at JAC Online (http://jac.oxfordjournals.org/).

A convenience sample of members of the public aged 16 and over was recruited through several routes. People attending appointments at 15 general practices across Tayside were invited by a researcher (K. S.) to complete the questionnaire. Patients of all ages attending general practitioner appointments were approached on days that the researcher was available. Refusals were not documented but estimated to be <10% and were mainly because the patient did not feel well enough to participate. Young people from a young people’s health and information project in Dundee city centre, which combines sexual health clinical services with a wide range of information services, were invited to participate by project staff. Questionnaires were visibly available at a health information facility, used mainly by outpatients and visitors at Ninewells Hospital and Medical School, Dundee, with staff promoting the survey and encouraging participation. Information on MRSA was not routinely available within the settings prior to completing the questionnaire.

Demographic data were collected, including age, gender and postcodes to ascertain the deprivation category as measured by Carstairs. This measure is applied to postcode sectors and has seven categories where 1 is the most affluent and 7 the most deprived. Ethnic groups were collected using the 2001 Census classifications.

The survey results were analysed using SPSS v.15.0. Proportions of responses were calculated with 95% confidence intervals and sub-group analysis was performed using a χ² test with a 5% significance level. Logistic regression analysis was performed to determine the effect of demographic factors on the responses to some individual questions.

Advice was sought from Tayside Research Ethics Committee to confirm that ethics permission was not required for this cross-sectional survey because responses were anonymous with no identifiable data being shared.

Results

The survey was continued until 1000 completed questionnaires were returned. Most of the participants (75.8%) were recruited through general practices 7.6% were recruited through the hospital health information facility and 3.9% from the young people’s project. The remaining 12.7% did not reply to the question of where they were given the questionnaire. As expected, when venues were compared, age groups were significantly (P = 0.028) different. The distribution of age among general practice participants was broadly similar to the general Tayside population, although those under 25 were underrepresented. The young people’s project was included to ensure the participation of under 25s, the age range of the client group; those participating through the hospital information facility had a greater proportion in the 45–64 age group. Overall, the age distribution and ethnicity of respondents were not significantly different from the Tayside population. Females and those in deprivation categories 6 and 7 were over-represented (Table 1). However almost 40% did not have postcode recorded so deprivation category could not be ascertained (Table 1).

The majority (86%) of respondents had heard of MRSA, and almost one-third (32%) knew someone who had had MRSA. Respondents in the hospital setting were more likely to know someone who had had MRSA than those in general practice or in the young people’s project (43% versus 31% and 21%, respectively; P = 0.028). Controlling for age revealed no significant difference between the young people’s project and the collective health care setting in knowing someone who had had MRSA. Almost half (47%) knew that someone could have MRSA without feeling ill (Figure 1).

When asked to describe MRSA in their own words, responses included: bacteria or infection (36%); originating in the hospital (22%); antibiotic resistant (12%); and a bug or superbug (12%). Hygiene, and the association with surgery or surgical wounds, were each mentioned by 9%. When asked specifically, 59% stated correctly that it is a bacterium, 14% thought it to be a virus and 27% were unsure or gave no response.

The most common sources of information, each being reported by 66% of respondents, were newspapers and TV. Other reported sources were friends (32%), radio (27%), family (25%), the internet (8%) and books (6%). Small numbers had received information from hospitals having been patients or visitors (2%) or had personal experience of MRSA in family members (1%).

The questionnaire contained a clinical scenario: ‘Mr X is in hospital recovering from an operation. He has just been told he has MRSA infection’. Respondents were asked to select, from a

<table>
<thead>
<tr>
<th>Table 1. Demographic data</th>
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<tbody>
<tr>
<td><strong>Age</strong></td>
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<tr>
<td>16–25</td>
</tr>
<tr>
<td>26–44</td>
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<tr>
<td>45–64</td>
</tr>
<tr>
<td>65+</td>
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<tr>
<td><strong>Gender</strong></td>
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<tr>
<td>female</td>
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<tr>
<td><strong>Deprivation category</strong></td>
</tr>
<tr>
<td>1 and 2</td>
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<td>3–5</td>
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<tr>
<td>6 and 7</td>
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<tr>
<td><strong>Ethnicity</strong></td>
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<tr>
<td>minority ethnic group</td>
</tr>
</tbody>
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list, possible causes of the infection. Options were that: Mr X was carrying MRSA and was now infected; the hospital wasn’t clean; ward staff had not been washing their hands between patients; Mr X had an allergic reaction to medication; or a visitor had passed on the infection. Many more respondents considered that a visitor might have passed on the infection to Mr X rather than that the patient carried it himself (50% versus 36%).

Treatment options for MRSA were presented and 47% agreed with the statement that it can be treated with antibiotics (Figure 1). Nine percent believed incorrectly that no treatment is necessary and 7% believed that it is untreatable.

Respondents were asked which categories of people can help stop MRSA spreading in hospitals and how they could help. Cleaning staff (77%) were thought to be the most responsible for stopping the spread of MRSA in hospital (Figure 1) by ‘applying old-fashioned methods’ and ‘doing their job properly’. The roles of doctors (70%) and nurses (72%) by ‘changing uniforms and white-coats regularly’ and ‘washing hands between patients’, and of patients (64%) and visitors (71%) by ‘avoiding contact with other patients’ and ‘not sitting on patient’s bed’, were also acknowledged (Figure 1). The contribution of cleaning staff was linked to their job of cleaning the wards by 85% of those who thought they had a role. However, handwashing was the most common preventive activity suggested, advocated by 13% of those who thought that cleaning staff had a role in stopping the spread, 42% for doctors, 40% for nurses, 31% for patients and 40% for visitors. Some respondents also referred to finding a cure or drugs to treat MRSA as being doctors’ contribution to stopping the spread.

Twenty percent of respondents would be very worried about getting MRSA if they were admitted to hospital, 22% quite worried and 32% a little worried (Figure 1). Only 7% would not be at all worried; 19% did not respond to this question. Specific worries were death (22%) and the potential effects on recovery, other conditions or treatment (19%), with small numbers expressing concern about amputation of limbs or how the infection was contracted.

Respondents were asked to estimate roughly how many people out of every 100 admitted to hospital would get an MRSA infection. Only 58% of respondents gave an estimate.

<table>
<thead>
<tr>
<th>Public knowledge of MRSA</th>
<th>% of respondents</th>
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<tbody>
<tr>
<td>MRSA is a bacterium</td>
<td>59</td>
</tr>
<tr>
<td>Healthy person can have MRSA without feeling ill</td>
<td>47</td>
</tr>
<tr>
<td>MRSA can be treated with antibiotics</td>
<td>47</td>
</tr>
<tr>
<td>MRSA is untreatable (INCORRECT)</td>
<td>7</td>
</tr>
<tr>
<td>Very worried about getting MRSA if admitted to hospital</td>
<td>20</td>
</tr>
<tr>
<td>Quite worried about getting MRSA if admitted to hospital</td>
<td>22</td>
</tr>
<tr>
<td>A little worried about getting MRSA if admitted to hospital</td>
<td>32</td>
</tr>
<tr>
<td>Not at all worried about getting MRSA if admitted to hospital</td>
<td>7</td>
</tr>
<tr>
<td>No response to question how worried</td>
<td>19</td>
</tr>
<tr>
<td>Cleaning staff can help stop spread of MRSA</td>
<td>77</td>
</tr>
<tr>
<td>Doctors can help stop spread of MRSA</td>
<td>70</td>
</tr>
<tr>
<td>Nurses can help stop spread of MRSA</td>
<td>72</td>
</tr>
<tr>
<td>Visitors can help stop spread of MRSA</td>
<td>71</td>
</tr>
<tr>
<td>Patients can help stop spread of MRSA</td>
<td>64</td>
</tr>
</tbody>
</table>

Figure 1. Summary of responses to key questions.
These estimates were quite evenly distributed: <5 (15%), 6–20 (18%), 21–50 (15%), >50 (10%) and no estimate (42%).

No significant differences were found in any responses when deprivation categories were compared. Responses to some questions seemed to be influenced by knowing someone with MRSA, and by the sex and age of the respondent. Logistic regression analysis was performed to determine the effect of these factors on the responses to individual questions. All reported values are after adjustment for age and sex (Figure 2).

The effect of socio-economic status on responses was also examined but no unadjusted relationship was found, so it was not included in the multivariate analysis.

People who knew someone who had had MRSA were significantly more likely to know that it is a bacterium (73% versus 63%) and to be aware of the possibility of asymptomatic carriage (67% versus 45%). However, they were more likely to think that MRSA is untreatable (11% versus 7%) and to be worried about getting MRSA if they were admitted to hospital (64% versus 45%). Even after adjustment for age and sex, respondents in the youngest age group were significantly less likely than those in the older age groups to know that MRSA can be treated with antibiotics (31% versus 61%), or that cleaners (88% versus 98%), visitors (81% versus 89%) or patients (71% versus 81%) have a role in infection control (Figure 2).

Only 14% of respondents thought that newspapers gave accurate information about MRSA. Nineteen percent of respondents commented on their response, such as ‘different papers different stories’. A typical comment was ‘I feel there is a lot of scaremongering associated with reports of MRSA’. Over half (55%) of the survey sample stated that they would like more information about MRSA. Almost all (85%) wanted to find the information in GP surgeries.

**Discussion**

Our survey, to our knowledge, is the first large-scale survey to establish knowledge and perceptions of MRSA in the general public.
Public knowledge of MRSA

population. Public awareness of MRSA and its treatment was higher than expected, mainly gained through the media, but with considerable gaps in knowledge. Over half did not know that someone could have MRSA without feeling ill or that it could be treated with antibiotics. Almost three-quarters would be at least a little worried about MRSA if admitted to hospital and estimates of prevalence were high. When asked directly whether patients or visitors had a role in helping stop the spread of infection, higher proportions stated that they did than recognized in the scenario that Mr X or his visitor may have been the source of infection. Knowing someone with MRSA makes the individual more likely to be knowledgeable about MRSA in general, but more likely to think it is untreatable and almost twice as likely to be worried about contracting MRSA if admitted to hospital. Fewer respondents had heard of MRSA (86% versus 94%) than was found by Gill et al.\textsuperscript{11} among a sample of 50 inpatients but our results were considerably higher than the 44% reported by Hamour et al.\textsuperscript{10} in a sample of 113 surgical outpatients and the 62% reported by Verhoeven et al.\textsuperscript{15} in a 2008 survey of 399 members of the Dutch general public.

In our study, descriptions of MRSA were in terms associated with serious illness. Estimates of prevalence in these respondents show that the public perceive MRSA as being much more common than it actually is. These findings, in addition to the extent of worry about getting MRSA if hospitalized, suggest that MRSA is an important issue among the population, consistent with others’ findings.\textsuperscript{1,13} A recent in-depth study of MRSA carriers found that they had high levels of stress mainly because of feeling stigmatized and a lack of knowledge, leading to emotional problems and educational needs.\textsuperscript{16}

No one in our sample mentioned the contributions to MRSA of antibiotic prescribing by doctors or patient use of antibiotics. Hawkings et al.\textsuperscript{15} found that 24% of their sample acknowledged that fewer antibiotics and adhering to prescription instructions could influence bacterial resistance.

This survey was carried out with a large sample, which allowed for narrower population estimates than previous studies. However, it is not free of limitations. Many of the questions focused on admission to hospital and so may have directed respondents to express their beliefs in a hospital context without considering issues such as antibiotic prescribing or MRSA outside the hospital environment. Although the demography of the sample surveyed was reasonably representative of the Tayside population, their knowledge and beliefs may not be representative of the wider general public. Recruitment sites and the willingness to participate are likely to have led to some sampling bias. This is likely to have overestimated people’s knowledge and awareness, and our results suggested considerable gaps in knowledge and misguided perception about MRSA in the sample of the population who did participate.

Our survey has revealed gaps in knowledge about MRSA, its transmission, prevention and treatment, and a perception of MRSA as a considerable threat for the general population. These findings will inform health information and communication strategies for MRSA, including educational packages for the general public and, in particular, patients entering hospital and their visitors. The key messages taken from a recent working group document\textsuperscript{9} would help address many of the gaps in knowledge that this study has identified (Figure 3).

Figure 3. Key messages to the public.

- Approximately 3% of the general population are carriers of MRSA, although this varies according to population, age and hospital contact of the individual.
- MRSA will not normally cause infection in a healthy person but infection can occur if bacteria enter the body.
- Less than 1 in 1000 people in hospital will get a serious MRSA infection.
- MRSA is sometimes more difficult to treat than other infections but it can be successfully treated with antibiotics.
- MRSA rarely causes death.
- Even if a hospital is spotlessly clean, bacteria can be brought in by patients themselves or transmitted by staff and visitors.
- Patients, relatives and visitors all have a role in preventing the spread of infections by cleaning their hands, avoiding touching dressings etc. and not bringing too many unnecessary personal items into hospital.

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Transparency declarations

C. M. has received funding to attend conferences in the last 3 years from Pfizer and Wyeth who are the manufacturers of various antibiotics and anti-infective products.

P. D. has been paid honoraria, consultancy fees or speaker’s fees by Johnson & Johnson, Optimer, Pfizer and Wyeth who are the manufacturers of various antibiotics and anti-infective products.

All other authors: none to declare.

Supplementary data

The questionnaire is available as Supplementary data at JAC Online (http://jac.oxfordjournals.org/).

References

Easton et al.


