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Health Protection Scotland

NHS National Services Scotland

NHS Scotland MRSA Screening Pathfinder Programme

Summary Interim Report

Prepared for the Scottish Government HAI Task Force
by Health Protection Scotland

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NHS Ayrshire & Arran

NHS Grampian

NHS Eileanan Siar Western Isles

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For all enquiries please contact:

HAI & IC Group
1 Cadogan Square
Cadogan Street
Glasgow
G2 7HF

Tel: 0141 300 1100
Fax: 0141 300 1170

Email: enquires@hps.scot.nhs.uk

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Designed and typeset by:

Graphics Team, Health Protection Scotland

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Executive Summary

The SGHD HAI Task Force is developing a strategy to further reduce MRSA infection in NHSScotland. This includes consideration of the value of MRSA screening. Health Protection Scotland (HPS) was asked in November 2007 by the Scottish Government Health Department (SGHD) to develop a pathfinder programme to review this, in the light of the recommendations of the National Health Service Quality Improvement Scotland (NHS QIS) Health Technology Assessment (HTA) [1] on the cost effectiveness of MRSA screening. The HTA recommended that universal screening of all acute in-patient admissions was likely to be clinically and cost effective. However this could not be firmly concluded as the evidence base for the HTA had gaps. The HTA recommended that a study was conducted in a whole Health board area to include both a tertiary referral hospital and one or more large general hospitals and data were to be collected for at least one year. HPS was therefore asked to lead a pathfinder programme on MRSA screening, the aims of which are:

1. To investigate the clinical effectiveness of MRSA screening as an intervention on outcomes (colonisation/infection/bacteraemia rates) in pathfinder boards
2. To test the estimates of the NHS QIS HTA economic model assumptions in pathfinder boards
3. To determine the acceptability of screening for MRSA in all acute in-patient admissions in pathfinder boards to patients and staff
4. To evaluate the feasibility and potential for rollout of the MRSA screening programme in the pathfinder boards

The MRSA screening pathfinder project was developed following evaluation of the proposed programme using the UK National Screening Committee screening criteria as a framework. This highlighted the areas where practical work was required prior to the introduction of an MRSA screening programme in acute hospitals in Scotland, including a primary study of the results of testing all patients admitted for in-patient care for MRSA colonisation. This interim report presents the findings of the project from the first five months of data collection.

MRSA screening of all acute in-patients commenced in August 2008 in NHS Ayrshire and Arran, NHS Grampian and NHS Western Isles Boards. A total of 29,690 patients (two thirds emergency and one third elective admissions) were screened on or before admission and discharged between August 1 2008 and December 31 2008.

The interim results related to the aim on clinical effectiveness indicate that the overall burden of MRSA colonisation on admission to hospital was 7.5%. This prevalence represents those detected: at pre-admission (and not decolonised prior to admission), on admission by nasal screening and those who are known previous MRSA positives on admission. The prevalence of colonisation in first time admissions (i.e. excluding readmissions) to hospital was 6.5%. The prevalence of those detected by nasal screen alone was 3.8%, however over time the number of known positives at the point of admission rises due to screening activity. At any given time therefore, the overall prevalence of MRSA colonisation in-

patients being admitted to hospital was 7.5%. This value represents the burden of patients requiring infection prevention and control management at a given point in time to prevent onward transmission of MRSA.

Factors influencing the prevalence of colonisation included: number of admissions per patient, specialty of admission, age and the source of admission. More than a quarter (27%) of all MRSA colonisations were detected in-patients with repeat admissions to hospital and almost a third (31%) of all known cases of MRSA on admission were repeat admissions. This proportion of patients, known to be positive at readmission, increased month on month after the initiation of the screening programme as predicted by the HTA model.

The highest MRSA colonisation prevalence, was found in-patient admissions to nephrology (20.3%), care of the elderly (19.8%), dermatology (17.9%) and vascular surgery (17.1%). The highest overall number of patient admissions colonised with MRSA however were found in medicine, general surgery and urology; accounting for a third of all MRSA colonisation cases identified overall. Those patients in high risk specialties (as defined by the HTA) had a colonisation prevalence of 6.4% compared to 8.7% in low risk specialties. This differentiation of risk was thus more important at the individual specialty level than grouped specialty level as indicated in the HTA.

Colonisation prevalence was higher in those over 65 years of age (11.5% compared with 4.4% in under 65s) and in-patient admissions transferred from a care home or other hospital to a pathfinder hospital. A quarter of patients admitted from care homes were colonised and 7% from other hospitals were also colonised. However, the total number of patient admissions from care homes and other hospitals as a proportion of overall admissions to hospital was small (1.6%).

Three percent of all those who were identified as colonised with MRSA on admission developed HA MRSA infection, compared to only 0.1% of those who were not colonised on admission to hospital. Specialties with a high rate of colonisation were also the specialties with a high rate of MRSA infection. This is likely to be an underestimate of all HAI at this point in the data collection, as not all admissions included have been discharged. This finding suggests that there is an opportunity for intervention associated with the screening programme in these specialties.

The screening programme in the pathfinder hospitals to date resulted in very few refusals from patients to participate (11 patients, 0.03%) and very few treatment deferrals (14 patients, 0.05%). However, a number of organisational issues were identified with implementing the strategy 2 for universal MRSA screening proposed by NHS QIS HTA. These include difficulties in achieving; 100% uptake of screening (88% achieved), and 100% compliance in decolonisation of those patients found to be colonised (41% had decolonisation undertaken), due to short lengths of stay and minimum two day turnaround time of the test result.

Patient movement within the hospital resulted in all patients who were positive being decolonised rather than those in high risk specialties as proposed by the HTA. This was because patients moved from low risk to high risk specialties within one admission and as such the opportunity to decolonise them at the point their screen result was available was missed.

Organisational issues also included a lack of isolation facilities to manage patients with MRSA (only 22% of patients requiring isolation were actually isolated). The majority of other patients were cohorted or separated from other patients during their stay. The evidence base for this practice is less clear and this finding reinforces the importance of all staff using Standard Infection Control Precautions at all times for all patients. These findings, in combination with the false negative results and the relatively low effectiveness of current decolonisation techniques, (53% according to the HTA) raises significant concerns about the proportion of colonised patients actually being rendered MRSA-negative, both in terms of resource uses and reduction in risk. This issue will be further characterised in the December report, and included in the rerun of the HTA model.

A small percentage (9%) of all hospital admissions attend pre-admission clinics and are therefore able to be screened at this point in the patient pathway. A quarter of elective admissions in the pathfinder project were screened at pre-admission clinics: of these 2.4% were found to be colonised with MRSA and only a small proportion of these patients (10%) were successfully decolonised before admission. The added benefit of pre-admission screening is affected by the timing of the pre-admission clinic. In order to maximise the public health benefit of pre-admission screening, sufficient time (at least three weeks) is required for patients screened positive, to be decolonised and re-tested prior to admission.

A review of the literature, carried out as part of the pathfinder project, has revealed that there is no further evidence published since the HTA to support the role of staff screening in preventing the transmission of MRSA.

The second aim of the pathfinder project was on the modelling of cost effectiveness, a high proportion of the assumptions in the NHS QIS HTA on MRSA screening were not substantiated by these interim findings. It is too early to conclude that universal MRSA screening is not cost effective. Further data collection to complete one year's findings and detail the costs of clinical risk assessment are required before the HTA model can be rerun and conclusions can be drawn on the cost and clinical effectiveness of universal MRSA screening.

The third aim on patient and staff acceptability is being addressed by a special study and will be reported on in the final report in December 2009.

The fourth aim of testing the feasibility and practicality of universal MRSA screening was addressed in part in the first five months. Staff in the three NHS boards involved made great efforts with the pathfinder project and managed the implementation very well. However, certain organisational issues arose which require careful consideration before the screening programme can be extended nationally. The pathfinder project highlighted variation in practices related to screening and the associated interventions in the three NHS boards.

As with any national screening programme, there are benefits in establishing a standardised approach to its delivery which is flexible enough to reflect local circumstances within NHS boards. Further work requires to be undertaken to define how a national MRSA screening programme should be taken forward in this regard.

We therefore conclude that the public health principles and associated criteria, which should underpin any screening programme, are not currently met for universal MRSA screening. As such, the role of universal screening in acute hospitals in reducing MRSA colonisation and infection does not yet have a robust evidence base for wider implementation at present. Nonetheless, around 1 in 13 patients presenting to hospital are colonised with MRSA and in some specialties this is as high as 1 in 5 patient admissions. As such, screening practices in these high prevalence specialties (nephrology/ renal, vascular surgery, dermatology and care of the elderly) should be considered as a minimum for standardising screening practices in acute hospitals in NHSScotland to maximise the opportunity to intervene in order to prevent and control a significant proportion of MRSA infection.

Intelligence gathered from the remainder of the pathfinder project and lessons learned (including implementation costs) will contribute to this evidence base for a national screening programme. As such HPS recognises the need to share this with the rest of NHSScotland and will present these findings in the final report which is due for publication in December 2009.

Limitations

This interim report is a formative evaluation of MRSA screening implementation in three NHS boards and as such does not provide summative conclusions at this stage. The summative evaluation will be produced in the final report in December 2009.

The data collected over the five months are for patients who have been both admitted and discharged, therefore there are still a large number of patients who have a long stay who are still in hospital. These patients are likely to be more unwell and therefore have more risk factors for MRSA colonisation and infection than short stay patients. Therefore the numbers of both colonised and patients with infection are likely to be underestimates. Further, five months is too short a term for monitoring incidence of infection as the possibility of any seasonal variation cannot be taken account of. The recommendation from NHS QIS following the publication of the NHS QIS HTA was that estimates for repopulating the model needed to be collected over at least one year.

The data collected are dependent on accurate information being available from patient management systems and laboratory systems, where these data were not available they have been excluded from analyses.

Three NHS boards were included in the pathfinder project. Whilst these interim results are not representative of all NHSScotland, they do represent a teaching, district general and island setting collectively.

Recommendations

Data collection in the pathfinder boards should continue as planned for one full year and the findings should then be compared with the estimates in the NHS QIS HTA. The model should be repopulated with these observations to examine how the model performs with these new data.

The pathfinder project should examine key performance indicators for the programme in the next phase. One of these should be monitoring uptake of screening as part of development towards a national programme of MRSA screening.

An evaluation of the numbers of patients able to complete their decolonisation therapy successfully pre-admission and during in-patient stay is required to inform the development of the programme further.

HPS should continue the planned project to review risk assessment in order to identify the most indicative questions for MRSA colonisation.

Further research is needed on the modes of transmission of MRSA strains, the clinical epidemiology and outcome of the infections caused by new clones, and the design and evaluation of infection control measures.

Recommendations are dependent on the clinical effectiveness conclusions; these will be available in the December report. Work on re-populating the model should continue as planned and recommendations will be made within the final report.

An economic analysis should be carried out for the final report examining the value for money of the screening programme.

Current policies for screening practice and the associated interventions should be standardised within NHS Scotland.

Non-pathfinder boards should review their current screening practice as part of the planning process for implementation of a national screening programme. This should be considered when calculating resources required for national implementation.

Further analysis is required to investigate why all admissions are not screened. It is recommended that the pathfinder project teams investigate reasons for not screening patients with a view to improving the compliance.

Further investigation is required around patient's length of stay to examine whether those patients with short lengths of stay (<48 hours) can be predicted and potentially excluded from the screening programme.

Further examination of those patients seen at, and the timing of pre-admission clinics should be undertaken in order to maximise the potential for decolonising patients before admission.

Further investigation of those patients with repeated admissions should be undertaken to establish if these patients can be predicted with a view to developing policy on decolonisation of patients post discharge.

Delayed admissions and deferred procedures should be monitored throughout the study and considered in parallel with the findings of the staff patient acceptability study.

Hospital information systems in all NHS boards should be reviewed to ensure patients who are previously MRSA positive can be effectively flagged in these systems and managed appropriately on admission to hospital.

A national agreed laboratory protocol for screening and identification of MRSA is required for NHS Scotland. This should be based on the experience gained from the three pathfinder laboratories and take account of developments in methods over the past year. Development of the protocol should be led by the MRSA reference laboratory, who are best placed to assess current methods, in association with the Scottish Microbiology Forum.

Before any recommendation could be made to extend the MRSA screening programme to include the routine screening of staff, further research would be required to clarify the role of the colonised health care worker in the transmission of MRSA and the effectiveness of staff screening as an infection control measure.

SGHD should consider if MRSA screening should become a formal national screening programme (similar to other national screening programmes) and if so which national organisation(s) should have responsibility for monitoring the performance of the programme.

As far as possible, MRSA screening practice should be standardised in all NHS boards. Specialties suitable for inclusion in this standardisation of national screening based on these interim results and on national guidance could include: nephrology/renal, vascular surgery, dermatology and care of the elderly.

The findings from the final report in December should be considered by SGHD for further development of the national MRSA screening programme.

References

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