Kentucky Antimicrobial Stewardship Innovation Consortium

Educational Pearl

MRSA Nasal Screening Outside of Pneumonia

Nasal screening of methicillin-resistant *Staphylococcus aureus* (MRSA) helps identify MRSA colonization. MRSA nasal screening has a high negative predictive value (NPV) in community-acquired pneumonia, and low risk pneumonia patients with negative screens can stop empiric MRSA activity. MRSA colonization is identified as a risk factor for MRSA infection in multiple non-pneumonia guidelines.[1-3] Can a negative MRSA nasal screen be used to de-escalate therapy in non-respiratory infections?

Does MRSA nasal colonization predict colonization at other body sites?

MRSA nasal screening may not fully capture MRSA colonization at other body sites. A systematic review of 23 studies assessed the utility of extra-nasal screening for MRSA colonization. Nasal screening alone detected only 76.1% of patients colonized with MRSA. The addition of rectal or oropharynx MRSA screening increased yield by approximately 20%.[4]

What is the predictive value of MRSA nasal screening for non-pneumonia infections?

A large study examined the utility of nasal screening in predicting MRSA in clinical cultures from various sterile and non-sterile sources. The positive predictive value (PPV) and NPV of MRSA nasal screening in predicting MRSA recovery in non-respiratory cultures is shown in the table below.[5]

Table 1. PPV and NPV of MRSA nasal screening for MRSA recovery in non-respiratory cultures

Culture source	PPV (95% confidence interval)	NPV (95% confidence interval)
Blood	27.8% (27.4% - 28.3%)	96.8% (96.6% - 96.9%)
Intra-abdominal	18.8% (17.5% - 20.1%)	97.9% (97.6% - 98.2%)
Wound	34.2% (38.8% - 34.6%)	90.4% (90.2% - 90.6%)
Urine	7.6% (7.4% - 7.7%)	99.1% (99.0% - 99.1%)

In an emergency department study of patients with skin and soft tissue infections (SSTI), MRSA was identified in 44.8% of cultures. The PPV and NPV of MRSA nasal screen was 85.7% and 72.8%, respectively. Additionally, a positive MRSA nasal screen was more sensitive than risk factors alone (e.g., dialysis, recent hospitalization and antibiotics) when assessing the risk of MRSA SSTI.[6]

Has MRSA nasal screens been used to de-escalate antibiotics in non-pneumonia infections?

Stopping empiric MRSA activity based on negative MRSA nasal screenings has been studied in patients with diabetic foot infections without MRSA infection in the previous 12 months. Protocolized de-escalation with a negative MRSA nasal PCR was associated with reducing the median duration of anti-MRSA antibiotics from 72 to 24 hours. No significant differences were observed in re-initiation of anti-MRSA antibiotics (15.7% vs. 6.1%), in-hospital mortality (2.4% vs. 2.9%), or acute kidney injury (15.7% vs. 6.1%) before and after protocol implementation.[7]

Key Takeaway: A negative MRSA nasal screen has high negative predictive value for MRSA infections outside of pneumonia but may be limited when the prevalence of MRSA is high (e.g. skin and soft tissue infections). Evidence supporting this empiric MRSA de-escalation is limited.

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