

Methicillin-Resistant *Staphylococcus aureus* (MRSA) Neonatal Intensive Care Unit (NICU) 2009 Screening Data

Introduction

Commencing January 1, 2009, Senate Bill 1058 (Health and Safety Code Section 1255.8 (b)) required that each patient who is admitted to a health facility shall be tested for methicillin-resistant *Staphylococcus aureus* (MRSA) within 24 hours of admission if they will be admitted to an intensive care unit of the hospital. California Department of Public Health Office of Legal Services made a determination that infants born admitted to neonatal intensive care units (NICUs) in the admitting hospital were not excluded from this provision.

Methods

In order to assess the potential benefits and costs of this provision, California hospitals were asked via an email list to voluntarily and anonymously submit data on the results of MRSA screening of patients born in the admitting hospital and admitted to NICUs, to the Healthcare Associated Infections Program using a standard form. Information requested included number of NICU admissions directly from labor and delivery (number of infants tested), number of infants positive, method of testing (since a molecular-based test such as polymerase chain reaction or PCR is more sensitive than traditional culture), and factors associated with positive infants, if known (since risk-factor based screening might be a cost effective alternative to testing all admissions).

Results

Twenty-one hospitals submitted MRSA NICU admission screening results for 2009 to CDPH. Of 5289 infants born in the admitting hospital, 8 (0.15%) tested positive for MRSA on admission to the NICU. The results for each hospital are shown in the Table. Of the 21 hospitals, babies tested positive in 5 (24%). Of 962 babies tested in these 5 hospitals, 8 (0.8%) were positive. Of the 21 hospitals, 16 (76%) tested 4327 babies without a positive test. Two hospitals reported using PCR rather than culture; neither had a positive test but only 66 and 63 patients were tested in each. For two infants, factors associated with positive testing were reported including a history of currently active MRSA infections in multiple family members and a maternal MRSA infection 4 years previously.

Discussion

There are approximately 166 hospitals in California with at least one NICU bed according to OSHPD data; 116 hospitals are classified by DHCS CCS as having community, intermediate, or regional NICUs. Thus, this data was submitted by between 13-18% of California hospitals with NICUs. There are approximately 53,000 NICU admissions each year in California to the 166 hospitals with NICU beds according to OSHPD data; this data represents approximately 10% of those admissions. We have no information on the extent of compliance or noncompliance with this MRSA screening requirement.

There is no way of knowing how representative this data is of all NICU admissions in California. It is possible that the rate of positivity in non-reporting hospitals was higher than in reporting hospitals. In the few published reports of MRSA colonization of infants admitted to NICUs at birth, colonization rates are generally 1% or less. However, these studies usually determine colonization over time and not just on admission. In the most informative study, over a seven-year period in a large Boston hospital all infants admitted to the study NICU were screened for MRSA colonization with weekly nasal/rectal swabs.¹ Of 7997 infants admitted to the NICU, 102 (1.3%) were colonized or infected. However, only 6 of the 102 infants were identified as having MRSA within the first 3 days of life and the median time from admission to positive MRSA culture results was 12 days, with a range of 1 to 119 days. Thus, the rate of MRSA colonization at birth in this study was less than that reported by California hospitals to us, and indicates that the rate is not likely to be an underestimation of the rate in all tested infants.

The benefits, if any, of identifying MRSA colonized infants are unknown; there is no statutory requirement to manage patients differently based on these results. Whether these patients were placed on contact isolation and, if so, whether this prevented transmission or infection is unknown. There are no guidelines established on how to manage NICU patients identified at birth as positive for MRSA since there is no evidence on which to base such recommendations.

Information on the cost of cultures was not collected, but \$20 per test, including administrative costs, is a conservative estimate, and the cost can be \$30 test or higher. Thus, the cost of testing the 5289 infants can be estimated to be approximately \$105,780, or \$13,222 per positive test. The range in testing cost per hospital was an estimated \$600 to \$15,420 in 2009. If all the approximately 53,000 NICU admissions each year in California were tested in accordance with the law, the cost would be approximately \$1,060,000 per year.

1. Gregory ML, Eichenwald EC, Puopolo KM. Seven-year experience with a surveillance program to reduce methicillin-resistant *Staphylococcus aureus* colonization in a neonatal intensive care unit. *Pediatrics*. 2009 May;123(5):e790-6

Table

Hospital	Tested	Positive	Percent Positive
1	347	0	
2	654	0	
3	66	0	
4	142	0	
5	228	1	0.40%
6	30	0	
7	139	1	0.70%
8	129	0	
9	397	0	
10	140	3	2.10%
11	63	0	
12	771	0	
13	34	0	
14	66	0	
15	243	1	0.40%
16	361	0	
17	212	2	0.90%
18	166	0	
19	407	0	
20	179	0	
21	515	0	
	5289	8	0.15%