Prevalence of nasal carriage of *S aureus* in children

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Abstract

Asymptomatic carriage of *Staphylococcus aureus* is common, particularly in the anterior part of the nasal cavity. Apart from nasal and nasopharyngeal carriage, another frequent site for *S aureus* colonization is the skin, particularly the inguinal fold, rectum and axilla. The general prevalence of *S aureus* carriage is around 20-30% as reported by relevant studies in field literature. In children, data on nasal carriage appears to be somewhat similar to the prevalence reported in adults, ranging from 18.12 to 38.5 percent, but there are certain particularities and a wide variability between results from different countries and different studies. To determine the real prevalence of *S aureus* and MRSA strains, studies should adjust for confounding factors, as described in this article.

Keywords **Nasal carriage, *Staphylococcus aureus*, MRSA, antibiotic resistance.**

Asymptomatic carriage of *Staphylococcus aureus* is especially common, particularly in the anterior part of the nasal cavity, where a prevalence rate of around 20% has been reported.[1] Available literature data for S *aureus* nasal colonization in the USA showed a 32.4% prevalence of S *aureus* and 0.8% for methicillin-resistant S *aureus* (MRSA) during 2000-2001,[2] with similar data for 2006: 31.6% and 0.84%, respectively.[3] In the UK, data from 1998 identified a 23% prevalence of S *aureus* (1.5% MRSA)[4] while a study performed in elderly residents care homes performed during 2006-2009 reported rates of 19-22%.[5] More recent data from a cross-sectional study in 32 206 subjects from nine European countries (Austria, Belgium, Croatia, France, Hungary, Spain, Sweden, the Netherlands, UK) revealed a prevalence of 21.6% for S *aureus* and 0.28% for MRSA.[6]

Apart from nasal and nasopharyngeal carriage, another common site for S *aureus* colonization is the skin, particularly the inguinal fold,[7] rectum and axilla.[8] The bacterial strains can display an altered antibiotic sensitivity profile, particularly in elderly patients, with comorbid diseases, causes of immune suppression, previous antibiotherapy or history of prior hospital admission during the pasts months.[9]

In children, data on nasal carriage appears to be somewhat similar to the prevalence reported in adults, but there are certain particularities, better described in the Table below. One particular study identified the main risk factor for MRSA carriage in children as having a parent with MRSA carriage.[10]

Data on nasal carriage of S *aureus* is quite polymorphic and the results of epidemiological studies can vary based on a large number of intrinsic factors, such as: timeline of sample collection, season of sample collection, characteristics of subjects included in the study (data from day care centers, kindergartens, schools, versus data from stay-at-home children), age of study subjects, culture and identification technique, and so on. To determine the prevalence of S *aureus* and MRSA strains with a higher accuracy, studies should adjust for factors which might have a significant impact on study results, as described above.

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Country	Time of study	Number of subjects tested	Overall prevalence of S aureus	Prevalence of MRSA strains	Rural/urban	Type of identification
China[11]	2005-2007 2008-2010 Overall	 2373	 18.12%	4.28% 9.25% 6.28%	Urban	Culture and disk diffusion antibiogram
Gabon[12]	February-July, 2009	500	29%	1%	Rural and semi-urban	Culture, VITEK-2 identification (Biomerieux)
Colombia[13]	June-November 2009	104	38.5%	4.8%	Rural	Culture and disk diffusion antibiogram
Hong Kong[14]	September 2009-April 2010	2211	27.6%	1.3%	Both. Day care centers	Culture and latex agglutination (Biomerieux)
Peru[15]	December 2010-June 2011	452 children and adults	24.6%	0.9%	Suburban community	Culture and disk diffusion antibiogram
Russia[16]	2011	63	31.7%	N/A	Urban "ecologically unfavorable district"	Random amplified polymorphic DNA
Gaza strip[10]	March-July 2012	379 children-parents pair	28.4%	12%	Both	Culture, VITEK-2 identification (Biomerieux)

Table. Studies describing the prevalence of *S aureus* and MRSA strains in children.

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Conflicts of interest All authors – none to declare.

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