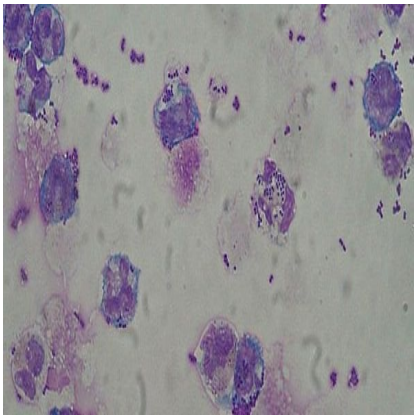
ICU
MANAGEMENT & PRACTICE

Spread of S. Capitis Clone Linked To Late-Onset NICU Sepsis



An unexpected global distribution of the Staphylococcus capitis (S. capitis) NRCS-A clone is implicated in cases of late-onset sepsis in neonatal intensive care units (NICU). The multi-resistant pathogen flourishes in the specific environment of NICUs, according to research conducted in Lyon, France and presented earlier this month at the European Congress of Clinical Microbiology and Infectious Diseases in Barcelona.

Molecular Methodology

Various molecular methods were applied on to a dozen S. capitis isolates obtained from cases of neonatal sepsis in France, Belgium, Austria and the United Kingdom, as well as two isolates from adult sepsis patients. The research team, led by the International Center for Infectiology Resarch's Frédéric Laurent, MD, discovered that while the two adult isolates differed from the neonatal isolates, each of the neonatal strains were more than 80 percent similar to the NRCS-A pulsotype.

A clustered regularly interspaced short palindromic repeats (CRISPR) region was found in one adult isolate and in all of the neonatal isolates. The presence of a composite element which carries genes related to heavy metal detoxification was discovered upon sequencing of the neonatal isolates. Additionally, phylogenetic analysis of the four S. capitis strains which had whole-genome sequences available indicated that two elements of staphylococcal cassette chromosome mec (SCCmec) were independently acquired by the NRCS-A clone.

The Role of Vancomycin

Notably, each of the isolates displayed an increase in vancomycin and daptomycin minimum inhibitory concentrations. The high selective pressure for vancomycin in NICUs may explain how S. capitis NRCS-A is allowed to thrive in that specific environment. The clone can quickly increase vancomycin MICs when it is in the vicinity of vancomycin, leading to late-onset sepsis for vulnerable NICU patients.

Additional research is underway to reveal the mechanisms which facilitate the worldwide spread of S. capitis NRCS-A and the glycopeptide adaptation of the clone in the neonatal ICU environment. The researchers aim to understand why the NRCS-A strains of S. capitis experience more rapid increases in vancomycin and daptomycin minimum inhibitory concentrations compared to other tested strains.

Source: Healio Pediatrics
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