EDITORIAL

Bacteremia due to *Streptococcus gallolyticus*: A Name with an Ominous Significance?

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Abstract

Streptococcus bovis is an underrecognized agent of systemic infections. It underwent reclassification into different subtypes and is currently termed as *Streptococcus gallolyticus*. Bacteremia due to *S. gallolyticus* has been traditionally associated with colon cancer or hepatobiliary disease and can result in endocarditis. Detection of *S. gallolyticus* in blood cultures prompts a thorough clinical evaluation in order to clarify the source of the bloodstream infection and the presence of complications. Subspeciation is crucial to understand the disease association, which is now possible with the use of phenotypic detection methods, such as, Vitek 2. The retrospective study by Niyas et al. serves to call attention to this organism and optimal approach to management.

Keywords: Bacteremia, Endocarditis, *Streptococcus gallolyticus*.

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Streptococci belonging to *Streptococcus bovis* group are organisms that have been considered opportunistic pathogens as they rarely invade the bloodstream but only colonize the gut and the genitourinary tract of pregnant women. In the late 1900s and early 2000s, the *S. bovis* species underwent significant taxonomic changes that resulted in renaming *S. bovis* biotype I as *Streptococcus gallolyticus* subsp. gallolyticus, biotype II/1 as *Streptococcus infantarius* subsp. coli, and biotype II/2 as *S. gallolyticus* subsp. pasteurianus.

The association of *S. gallolyticus* subsp. gallolyticus bacteremia has been found to be 94 and 71% with infective endocarditis (IE) and underlying colonic malignancy, respectively. The organism is also commonly associated with hepatobiliary disease. However, *S. gallolyticus* subsp. pasteurianus bacteremia is less commonly associated with IE and occult colonic malignancy at the rate of 18 and 17%, respectively,[1] but often causes urinary tract infection (UTI) in women and neonatal septicemia and meningitis. It has the property to adhere to the extracellular matrix, such as, collagen, fibronectin, and fibrin, which is a mechanism for the pathogenesis of IE.

Years later, many clinicians continue to be baffled by the new speciation, but more importantly by the association between *S. bovis*, endocarditis, and colonic malignancy. The correct identification of *S. bovis* species by the use of conventional microbiology and biochemical methods was not always possible in the clinical laboratories leading to unfamiliarity of this organism in the minds of most clinicians. This is now rapidly changing with the use of Vitek 2, Phoenix, matrix-assisted laser desorption/ionization time of flight (MALDI-TOF), and molecular typing methods, such as, 16s rRNA typing, which can enhance the rate of isolation and identification of this organism. Therefore, this organism must be highlighted to make clinicians more comfortable with their management.

In this context, the study by Niyas et al.[2] on *S. gallolyticus* bacteremia conducted in a tertiary center in South India needs to be highlighted. The authors should be commended for their work on *S. bovis* group of organisms. This is a retrospective study of 1 year duration conducted between March 2019 and April 2020 at a tertiary care center in Kerala, where they found 16 cases of *S. gallolyticus* bacteremia which was identified by Vitek 2. Information regarding the total number of admissions during the study period would be helpful to know the actual incidence in hospitalized patients. Speciation and subspeciation of this organism is very important as it gives us a clue of disease association which is not possible by conventional identification methods. As *S. bovis* most commonly causes endocarditis, the collection of multiple blood cultures at time intervals is needed to show continuous bacteremia, a strong pointer to endocarditis. The study patients had undergone only transthoracic echocardiography (TTE) which has a lower sensitivity for the detection of endocarditis vegetations (40–60%) as compared to transesophageal echocardiogram (TEE) (94–100%).[1] The value of the study would have been enhanced if multiple cultures were collected at intervals and TEE was performed. The most commonly isolated subspecies in this study was pasteurianus, which, however, is less commonly associated with endocarditis, but nevertheless merits vigorous investigation. CT abdomen and colonoscopy are appropriate to detect premalignant colonic pathology as the underlying cause for bacteremia. The most common risk factor for bacteremia with this organism in this study was chronic liver disease and diabetes mellitus.

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Treatment selection and duration depends on the susceptibility to penicillin, which is checked by a minimum inhibitory concentration (MIC) method and not by disc diffusion. Hence, clinicians should insist on the correct method of testing and reporting. Phenotypic detection methods, such as, Vitek 2, aid in subspeciation of *S. gallolyticus* and also provide the MIC. The mention of MIC values in this study would have been helpful to get a sense of susceptibility or resistance, although resistance to B-lactams is rare in this pathogen. Still there is no room for complacency, as there is significant penicillin resistance among related organisms like viridans streptococci and enterococci. American Heart Association (AHA) recommends the use of ceftriaxone or combination of penicillin/ceftriaxone plus gentamicin for 2 weeks or B-lactam alone for 4 weeks as treatment for native valve endocarditis, when penicillin MIC is <0.12 mg/mL. For isolates with MIC of 0.12–0.5 mg/mL, the combination of B-lactams (4 weeks) and aminoglycosides (2 weeks) should be considered. If penicillin MIC is >0.5, therapy is extended by 2 weeks.[3] Vancomycin is used when B-lactam cannot be tolerated. If *S. gallolyticus* subsp. gallolyticus causes uncomplicated UTI, then duration of treatment is for 7–10 days. Literature review shows that *S. gallolyticus* is mostly resistant to clindamycin and erythromycin, which matches the data of this tertiary center, and should not be employed for treatment. Therapeutic response can be shown by repeating blood culture after 3 days of treatment to check for clearance of bacteremia. In addition to treatment of bacteremia, its source and complications should be treated, if necessary by surgery. The mortality rate of infection due to this pathogen with appropriate management is estimated to be 2–4%.[4] Knowledge of the clinical outcome of the patients in this study would have thrown further light regarding the treatment efficacy.

The nomenclature of this organism may appear to be intimidatory to many clinicians, but an appropriate approach to management of this ominous pathogen goes a long way to yield truly satisfying results.

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