Cardiac Valve Replacement Associated with Higher Values of Glycocalyx Production in Viridans Streptococcal Endocarditis

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INTRODUCTION

- Viridans streptococci is a significant cause of Bacterial Endocarditis with recent spikes particularly noted with IV drug use associated with the current opioid crisis.
- Viridans streptococci produce an exopolysaccharide (glycocalyx) that leads to adherence to cardiac heart valves and retards the penetrance of antimicrobials that may result in valvular insufficiency and ultimately replacement.
- Previously an association was found between Viridans streptococci blood cultures producing glycocalyx measuring a spectrophotometric absorbance of >0.120 on tryptophan assay and clinical endocarditis. This study evaluates whether particular spectrophotometric absorbance values of >1.40 correlate with more malignant endocarditis requiring valve replacement.

METHODS

- Fourteen isolates of Viridans streptococci were collected from patients with endocarditis that required valve replacement over a five-year period, to assess the absorbance of these isolates using the tryptophan assay.
- Glycocalyx production was quantified using the tryptophan assay developed by Shetlar et al.
- Glycocalyx production measurements by tryptophan spectrophotometric assay were evaluated to determine if there is a consistent and statistically significant correlation of particular spectrophotometric tryptophan assay measurements and bacterial endocarditis which resulted in valve replacement in the study population.

RESULTS

- 14 patient isolates collected 2011-2016 that required valve replacement were compared with those from the previous 123 isolates that determined the breakpoint of endocarditis to correlate with >0.120 on the tryptophan assay.
- A spectrophotometric breakpoint of >0.218 was found to correlate with need for valve replacement in the current study population.

CONCLUSION

- An association was found between glycocalyx production of bacterial endocarditis with a spectrophotometric value of >0.218 on the tryptophan assay and those requiring valve replacement - indicating this to be a useful marker of clinical pathogenicity that may help to predict which patients will go on to require surgery.

Credits/Disclosures/References


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