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ELEVENTH ANNUAL MEETING

Utility of echocardiogram in neutropenic patients with gram positive bacteremia – a retrospective study

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INTRODUCTION

- Hemato-oncology patients are vulnerable to bloodstream infections due to their immunocompromised and neutropenic state, and the common use of intravascular catheters.
- The risk of infective endocarditis (IE) among non-neutropenic patients with gram positive bacteremia is substantial, however the risk is considered to be lower among neutropenic patients, though data is limited.

AIM

We aimed to evaluate the incidence of IE among neutropenic hemato-oncology patients cohort, and to explore the yield of echocardiogram in this specific population.

METHOD

- A single center, retrospective study.
- Between 01/2007 and 12/2019, hospitalized patients in the Hematology department consisting of the hemato-oncology and bone marrow transplantation units were included, if they had positive blood cultures for specific organisms known to cause IE while neutropenic.
- Patient characteristics, results and timing of blood cultures and echocardiogram obtained during hospitalization were collected.

RESULTS

- 274 patients had positive blood cultures with pathogens known to be associated with IE. Overall, 340 isolates have been identified. After excluding 57 coagulase negative staphylococcus (CONS) isolates which were suspected as a contamination (identified in a single collection), 241 patients were included with 283 isolates.
- CONS were the most commonly isolates found, followed by streptococcus viridans, comprising 31.4% (89) and 24.3% (69) of isolates, respectively.
- Trans thoracic echocardiography (TTE) was performed in 108 (45%) patients overall, of which 14 (5.8%) had additional trans esophageal echocardiogram (TEE).
- Only one case of IE was diagnosed in our series, of a forty seven year old female patient with a diagnosis of multiple myeloma in relapse after autologous stem cell transplantation. The patient presented with a stroke caused by septic emboli, fever and streptococcus viridans bacteremia. Lab works showed neutropenia of 0K/micl and thrombocytopenia of 8K/micl. TTE and TEE failed to demonstrate valvular pathology consistent with IE in this case. Valvular vegetations have not been identified on TTE nor on TTE in any other case as well.

Characteristics	Number (N=241)
Hematological malignancy	
Acute myeloid leukemia	125 (51.9%)
Acute lymphoblastic leukemia	28 (11.6%)
Myelodysplastic syndrome	3 (1.2%)
Lymphoma	49 (20.3%)
Multiple myeloma	27 (11.2%)
Other	9 (3.7%)
Hematopoietic cell transplantation	
None	102 (42.3%)
Autologous	41 (17%)
Allogenic	98 (40.7%)
Co-pathogen	
Gram negative bacteria	37
Candida spp.	8
Gram positive co-pathogen	4
Anthracycline exposure	187 (77.6%)
Predisposing heart disease	
Prosthetic heart valve	2
Other valve pathology	4
Congenital heart disease	2
Cardiac implantable device	2
Other risk factors for IE	
Hemodialysis	2
IVDU	0
Previous IE	0
Intravascular graft	0

Characteristics of patients

	Number (N=241)
TTE performed	108 (45%)
TEE performed	14 (5.8%)
Vegetation observed	0
Immunological phenomena	0
Vascular phenomena	1
New HF	26 (10.7%)
Within 30 days of bacteremia	17 (7%)
HFREF	23 (9%)
HFPEF	3 (1.2%)
Recurrence of bacteremia	17 (7%)
Mortality 30 days	50 (20.7%)

Echocardiography data and outcomes

CONCLUSIONS

In our experience, the yield of echocardiogram in hemato-oncological neutropenic patients with gram positive bacteremia is extremely low, owing to reduced probability of IE in this population, and thus could be avoided in most cases.

REFERENCES

1. **Loh, Z., et al.,** Echocardiography has low utility in cancer patients with Staphylococcus aureus bacteraemia: findings from a retrospective study. Support Care Cancer, 2018. 26(9): p. 3083-3089.
2. **Beteille, E., M. Guarana, and M. Nucci,** Infective endocarditis in neutropenic patients with viridans streptococci bacteraemia. Clin Microbiol Infect, 2018. **24**(8): p. 916-917.
3. **Camp, J., et al.,** Impact of neutropenia on clinical manifestations and outcome of Staphylococcus aureus bloodstream infection: a propensity score-based overlap weight analysis in two large, prospectively evaluated cohorts. Clin Microbiol Infect, 2022. 28(8): p. 1149 e1-1149 e9.

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