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## Research Article

### STUDY OF BACTEREMIA IN PATIENTS WITH CELLULITIS OF LEGS

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#### ABSTRACT

**Background:** Cellulitis is an acute bacterial infection involving dermis and subcutaneous tissue characterized by erythema, induration and tenderness of the involved skin. Bacteremia is the presence of viable bacteria in the blood stream. Recent data suggests that incidence of bacteremia in cellulitis patients are increasing, most often in those with severe infections and comorbidities. Because of high morbidity and mortality associated with bacteremia it is critical to detect the incidence of bacteremia in cellulitis patients

**Materials & Methods:** 50 clinically diagnosed cases of cellulitis who satisfied inclusion and exclusion criteria were taken for study. Sample was collected within 48 hrs of diagnosing the condition and was analyzed.

**Results:** The incidence of bacteremia was 6%. Most frequently isolated bacteria was Beta Hemolytic Streptococcus. Two patients with positive blood culture were found to be diabetic. No antibiotic resistance detected in positive samples.

**Conclusion:** Blood culture though not specific should be performed in patients who have factors increasing the risk of bacteremia. As the bacteremia can be associated with increased mortality it is better to do blood culture in all possible patients.

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#### INTRODUCTION

Cellulitis is an acute bacterial infection involving dermis and subcutaneous tissue<sup>1</sup>. It is characterized by erythema, induration and tenderness of the involved skin<sup>2</sup>. It is more common in lower extremities and is usually produced by group A streptococci and Staphylococcus aureus<sup>2</sup>. Constitutional symptoms such as fever, malaise and chills are often present.

Bacteremia is the presence of viable bacteria in the blood stream<sup>3</sup>. The immune response to the bacteria can cause sepsis and septic shock which has a relatively high mortality rate. Bacteria can also use the blood to spread to other parts of the body, causing infections away from the original site of infection.

Recent data suggests that incidence of bacteremia in cellulitis patients is increasing, most often in those with severe infections and comorbidities<sup>4</sup>. High morbidity and mortality associated with bacteremia makes it critical to detect & study the incidence of bacteremia in cellulitis patients<sup>4</sup>. It also helps in suitable selection of antibiotics<sup>4</sup>

#### MATERIALS AND METHODS

##### Patient Recruitment

Fifty clinically diagnosed cases of cellulitis which satisfied inclusion and exclusion criteria were recruited for the study. Patients were enrolled from out-patient and inpatient departments of Dermatology & Surgery of Father Muller Medical College Hospital, Mangalore for a period from December 1 2015 to July 30 2016.

##### Inclusion Criteria

- Patients diagnosed with cellulitis
- Cellulitis in leg at or below the level of buttocks
- Patient willing to participate in the study
- Age >18 years
- Sample collection within 48 hrs of hospital admission

##### Exclusion Criteria

- Patients who were not willing for the study.
- Patients with age < 18years.
- Patients who had taken more than 2 days of antibiotics before admission

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- Patients with secondarily infected dermatological diseases such as folliculitis, septic arthritis with surrounding cellulitis, carbuncles & furuncles or patients with necrotising fasciitis

**METHOD**

Blood culture was performed. From the vials, microbiologist performed gram stain for rapid, general identification of the bacteria. The blood was also subcultured onto agar plates to isolate the pathogenic organism for culture and susceptibility testing. This culture and sensitivity (C&S) process identified the species of bacteria.

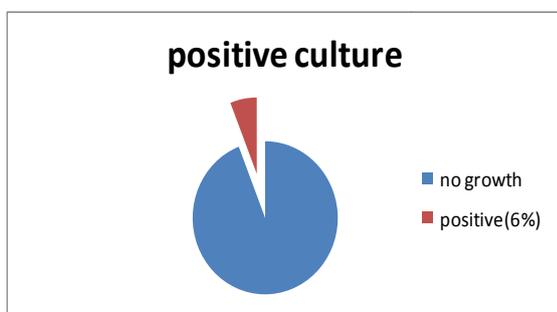
**Statistical Analysis**

Collected data was analyzed by frequency, table and graph

**RESULTS**

Out of 50 patients enrolled for the study, number of females and males were 28 and 22 respectively.

Three patients showed positive blood culture for bacteria (6%)



Most commonly found organism was beta hemolytic streptococcus which was detected in two samples (fig.1). One sample showed culture positive for staphylococcus aureus. No sample showed resistant strains.



Fig1

**DISCUSSION**

Incidence of cellulitis is 16.4-24.6 per 1000 person-years in developed countries<sup>5</sup>. According to recent studies, bacteremia is considered as an independent risk factor for mortality in patients with soft tissue infections<sup>6</sup>. Bacteremia is associated with a mortality rate of 14-37%<sup>7</sup>.

A study was conducted by Tay EY *et al*<sup>8</sup> at Singapore among 214 patients with cellulitis from march 2003 to march 2012. Incidence of bacteremia was 10.8% and the incidence increases with mean duration of hospitalization. There was no difference in mortality between patients with and without bacteremia

Similar study was conducted by Lasa JS *et al*<sup>9</sup>-Out of 140 patients, Bacteremia was detected in 8.6%. Most frequently isolated bacteria were Group G Beta Hemolytic Streptococcus (33%). They also found out that Risk factors associated with bacteremia were positive skin and soft tissue culture (75%), diabetes (41.7%), alcoholism (16.7%), COPD (16.7%)

Studies	Tay ey <i>et al</i>	Lasa js <i>et al</i>	Our study
Area of studies	Singapore	Argentina	India
Findings	Staphylococcus aureus: 35%	Group B haemolytic Streptococcus: 33%	Staphylococcus aureus: 33.33%. Group B haemolytic Streptococcus: 66.6%

Comparison of studies	Tay ey <i>et al</i>	Lasa js <i>et al</i>	Our study
Bacteremia	10.8 %	8.6%	6%
Sample size	214	140	50
Associated risk factors	Lymphoedema	Diabetes-41.7%	
	Orthopedic implant	Alcoholism - 16.7%	<b>Diabetes-35%</b>
	WBC count >13.5 X 10 <sup>6</sup>	COPD-16.7%	<b>Alcoholism-18%</b>
	Liver Cirrhosis	Other culture- 75%	
	CKD		

**CONCLUSION**

Incidence of bacteremia in our study was 6 %. Most common organism isolated was Group A Beta hemolytic streptococcus (66%). No resistant strains found out. As bacteremia can increase the mortality better to do blood culture atleast in patients with risk factors .Recommended further studies with larger sample size.

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