

BACKGROUND

Rothia spp. are gram positive bacteria which are known to cause infections in the immune compromised host. Literature is limited on the epidemiology and clinical significance of *Rothia* bacteremia.

METHODS

We reviewed medical records of all patients with blood cultures positive from 2006-2014. Descriptive analysis was performed as well as comparative analysis of neutropenic patients (absolute neutrophil count \leq 1000 μ L) at the time of bacteremia with non-neutropenic patients at the time of bacteremia. Fischer's exact tests were used for comparisons of proportions and medians, respectively, with p -values <0.05 considered statistically significant.

RESULTS

29 patients with *Rothia* bacteremia were identified. Median age was 58 years (range 27-73), with no significant gender difference ($p=0.94$). Charlson comorbidity score of 4 or greater was found in 20 (69%) of patients; 20 (69%) patients had a hematologic malignancy or bone marrow transplant. While there were 15 deaths, only 1 was possibly attributed to *Rothia* infection. Neutropenia was observed in 21 (72%) patients at the time of bacteremia. Neutropenic patients were less likely than non-neutropenic patients to have polymicrobial infection (24% vs. 63%, $p=0.083$); and were also more likely to have multiple positive blood cultures (76% vs. 0%; p value=0.0003). There was no difference between the two groups in need for ICU care, mortality or attributable mortality. Statistically significant difference was seen for steroid use (81% vs. 13%, $p=0.0014$), and fluoroquinolone use (86% vs. 13% $p<0.0001$) preceding bacteremia in neutropenic patients. Presence of intra-vascular catheter was also more pre-dominant in the neutropenic group (57% vs. 13%, $p=0.035$) at the time of bacteremia.

RESULTS

Table 1: Demographics & clinical characteristics of patients with *Rothia* bacteremia

Variable	All Patients (n=29)	Neutropenic (n=21)	Non-neutropenic (n=8)	P-value
Median age in years (range)	58 (27,73)	56 (27,72)	56 (32,73)	0.94
Sex				
Male	15	10	5	
Female	14 (48%)	11 (52%)	3 (38%)	0.68
Stem cell Transplant	3 (10%)	3 (14%)	0 (0%)	
Allogeneic	2 (7%)	2 (10%)	0 (0%)	
Autologous	1 (3%)	1 (5%)	0 (0%)	
Comorbidities				
Leukemia	16 (61%)	16 (89%)	0 (0%)	
Lymphoma	1 (4%)	1 (5%)	0 (0%)	
Solid Tumor	3 (11%)	1 (5%)	2 (25%)	
Diabetes Mellitus	1 (4%)	0 (0%)	1 (13%)	
Chronic Renal disease	2 (8%)	0 (0%)	2 (25%)	
Chronic Liver Disease	2 (8%)	0 (0%)	1 (13%)	
Chronic Lung Disease	1 (4%)	0 (0%)	2 (25%)	<0.0001
Medication use within 30 days prior to bacteremia				
Corticosteroids	18 (62%)	17 (81%)	1 (13%)	0.0014
Fluoroquinolone	19 (66%)	18 (86%)	1 (13%)	
Other anti-microbial	2 (7%)	2 (9%)	0 (0%)	
None	8 (28%)	1 (5%)	7 (87%)	<0.0001
Presence of central venous catheter at time of bacteremia	22 (76%)	18 (86%)	4 (50%)	0.068
Source of bacteremia				
Catheter related bacteremia	13 (45%)	12 (57%)	1 (13%)	0.035
Presumed gut translocation with negative CT scan of Abdomen	2 (7%)	1 (5%)	1 (13%)	
Neutropenic colitis	1 (3%)	1 (5%)	1 (13%)	
Catheter related bacteremia & endocarditis	1 (3%)	1 (5%)	0 (0%)	
Mucositis	1 (3%)	1 (5%)	0 (0%)	
No source identified	11 (38%)	5 (24%)	6 (75%)	0.064

Table 2: Microbiological characteristics & clinical outcomes of patients with *Rothia* bacteremia

Variable	All Patients (n=29)	Neutropenic (n=21)	Non-neutropenic (n=8)	P-value
Type of <i>Rothia</i> species				
<i>Rothia mucilaginosa</i>	26 (90%)	20 (95%)	6 (75%)	
<i>Rothia dentocariosa</i>	3	1	2	0.18
Presence of polymicrobial infection	10 (34%)	5 (24%)	5 (63%)	0.083
More than single blood culture positivity	16 (55%)	16 (76%)	0 (0%)	0.0003
Days of hospitalization	11 (0,76)	18 (0,76)	9.5 (0,16)	0.064
Need for ICU Care	8 (28%)	6 (29%)	2 (25%)	1.00
Complications				
Endocarditis/Roth spots	1 (4%)	1 (5%)	0 (0%)	
Septic shock	4 (14%)	3 (15%)	1 (13%)	
Altered Mental Status	1 (4%)	1 (5%)	0 (0%)	
Epiglottitis	1 (4%)	1 (5%)	0 (0%)	
None	21 (75%)	14 (70%)	7 (87%)	1.00
Estimated Survival at 67 days	67%	44%	75%	0.67
Attributable Mortality (Deaths=14)				
Underlying disease	5 (36%)	3 (33%)	2 (40%)	
Secondary to <i>Rothia</i>	1 (7%)	1 (11%)	0 (0%)	
Other reasons	9 (57%)	5 (56%)	3 (60%)	1.00
Antimicrobial treatment				
Vancomycin	23 (79%)	18 (86%)	5 (63%)	0.30
Daptomycin	2 (7%)	2 (7%)	0 (0%)	1.00
Carbapenem	13 (45%)	13 (62%)	0 (0%)	0.0033
Piperacillin-Tazobactam	2 (7%)	1 (5%)	1 (13%)	0.48
Cephalosporin	2 (7%)	1 (5%)	1 (13%)	0.48
Duration of Antimicrobial treatment (median (range)) (days)	13 (0, 58)	14 (1, 58)	6.5 (0, 33)	0.10

Table 3: Charlson Co-morbidity Index score patients with *Rothia* bacteremia

Charlson co-morbidity index	All patients (n=29)	Neutropenic (n=21)	Non-neutropenic (n=8)	P-value
1	2 (7%)	1 (5%)	1 (13%)	
2	7 (24%)	5 (24%)	2 (25%)	
3	0 (0%)	0 (0%)	0 (0%)	
4	7 (24%)	6 (29%)	1 (13%)	
5	11 (38%)	7 (33%)	4 (50%)	
6	2 (7%)	2 (9%)	0 (0%)	0.84

Table 4: Clinical characteristics & clinical outcomes between pure *Rothia* vs. Polymicrobial group

Variable	Pure <i>Rothia</i> (n=19)	Polymicrobial (n=10)	P-value
Patient Characteristics			
Age 60+	53%	40%	
Female	53%	40%	
Heme Malignancy/ Stem cell transplant	84%	50%	0.08
Central venous catheter in place	79%	70%	
Catheter related bacteremia	58%	30%	
Clinical Findings			
Fever	84%	70%	
Neutropenia	84%	50%	0.08
Medication use in last 30 days			
Prior fluoroquinolone use	79%	60%	
Prior steroid use	68%	50%	
Treatment			
Primary Vancomycin Treatment	74%	60%	
Secondary Carbapenem Treatment	37%	40%	
Clinical Outcomes			
Central venous catheter removal	58%	40%	
Need for ICU Care	26%	30%	

CONCLUSIONS

- Rothia* bacteremia is seen in patients with medical co-morbidities, predominantly in patients with leukemia.
- A significant association was seen with prior use of steroid and fluoroquinolone prophylaxis in neutropenic patients who developed *Rothia* bacteremia.
- Rothia* bacteremia in neutropenic hosts was mostly monomicrobial and less likely thought to be a contaminant.

REFERENCES

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