Simultaneous Detection of Selected Fungal and Bacterial Pathogens by Real Time PCR in Patients with Fever and Neutropenia

Merva G.Mansour¹, Iman A.Ragab¹, Marwa M.Saad², Iman El-Kholy³, Ebtsam R.Abd El-Hafez¹

¹ Pediatrics Department, Faculty of Medicine ² Microbiology Department, Faculty of Medicine, Microbiology Department, Faculty of Science, Ain Shams University, Cairo, Egypt

Abstract

A cross sectional observational study included 45 hematology oncology patients presenting with fever and neutropenia. Bacterial and fungal cultures with antibacterial sensitivity test and Multiplex PCR for detection of some common selected organisms.. Detection of acinetobacter was similar in blood culture and PCR. Ecoli was detected in 2.2% of blood culture compared to 6.7% of PCR. MRSA was negative in all cultures. Aspergillus was detected in only one blood culture and one PCR result. Candida albicans was positive in 6.7% of PCR results compared to 2.2% of blood culture results. Candida kruzi was positive in 5 (11.1%) of PCR result compared to 0% in blood culture.

Background

There is increasing in the frequency of antimicrobial resistance, fungal infections, and prolonged duration of episodes of infections in cancer patients over the last years. A rapid detection might accelerate targeted antimicrobial treatment. We aimed to compare the real-time polymerase chain reaction (RT-PCR) with conventional blood cultures (BC) method in detection of selected pathogens in cancer patients presenting with fever and neutropenia

Objective

to compare the real-time polymerase chain reaction (RT-PCR) with conventional blood cultures (BC) method in detection of selected pathogens in cancer patients presenting with fever and neutropenia.

Comparison between PCR and conventional blood culture

	Blood culture		PCR		P-value
	No.	%	No.	%	
Total	10	22.2 %	19	42.2 %	0.042
Acinetobacter	4	8.9%	4	8.9%	1.000
Klebsiella	3	6.7%	4	8.9%	0.694
Candida albicans	1	2.2%	3	6.7%	0.306
Candida kruzi	0	0.0%	5	11.1 %	0.021
Candida not typed	0	0.0%	1	2.2%	0.315
Aspergillus	1	2.2%	1	2.2%	1.000
E.coli	1	2.2%	3	6.7%	0.306
MRSA	0	0.0%	1	2.2%	0.315

Distribution of Blood culture between deceased and survivors

Materials & Methods

A cross sectional observational study included 45 patients presenting with fever and neutropenia. It was performed in Ain Shams University, Pediatric Hospital, hematology-oncology unit. All patients were subjected to bacterial culture and antibacterial sensitivity test and fungal culture. Multiplex PCR was done using QIAGEN Multiplex PCR Kits (Qiagen Germany) for detection of some common selected organisms

Distribution of PCR positive results between community acquired infection and nosocomial infection

Distribution of PCR results between deceased and survivors

Conclusion

PCR was superior to conventional culture in detection of Candida species. There was similar pattern of organisms in patients presenting with community acquired and hospital acquired infection raising the question of colonization in frequently admitted patients

Discussion

The high cost of PCR and lack of sensitivity pattern to detected organism versus the rapidity of results to tailor the empiric antimicrobial treatment is still a question of debate in areas with limited health resources

References

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