STUDY THE ROLE OF OSMOTIC DEBULKING OF GASTROINTESTINAL TRACT BACTERIA BY MANNITOL ON THE INCIDENCE OF SEPSIS IN ACUTE LEUKEMIA PATIENTS

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Introduction

Acute leukemia is defined as uncontrolled clonal proliferation of abnormal progenitor cells in the bone marrow and blood with detection of 20% blasts in peripheral blood and/or bone marrow or recurrent cytogenetic abnormalities defined by WHO.

Chemotherapy induces bone marrow suppression and prolonged neutropenia in acute leukemia patients , as a result, they are at a high risk of different types of infections. infections remain a major cause of therapy-associated mortality, and represent a frequent cause of treatment withdrawal. Intestinal barrier dysfunction secondary to chemotherapy enables pathogens to penetrate the epithelium , resulting in bacterial translocation which can predispose to systemic infection and also chemotherapy causes dysbiotic changes in the microbiome with a shift to Gram-negative pathogenic species and colonisation of opportunistic pathogens, normalisation of intestinal homeostasis could be an appropriate strategy to reduce chemo-toxicity. Prebiotic(as mannitol) administration results in improvement of barrier function in the gut.

Aim of the Work

The aim of this work was to investigate the role of osmotic debulking of gastrointestinal tract bacteria by mannitol at day one of starting chemotherapy on the incidence of sepsis in neutropenic patients diagnosed with acute leukemia and receiving induction chemotherapy.

Methods

The study will be conducted on 40 Egyptian adult patients with acute leukemia, receiving induction chemotherapy admitted to the Hematology Unit, Internal Medicine Department, Alexandria Main University Hospitals. Twenty neutropenic subjects did not undergo osmotic debulking by mannitol, and 20 neutropenic subjects underwent osmotic debulking by mannitol at day one and day six of starting chemotherapy.

All participating patients enrolled in the study will be subjected to the following: Serum procalcitonin level by Chemiluminescence and Supersensitive C-reactive protein on days 7 and 12 of chemotherapy. Blood culture On days 1,7 after starting chemotherapy and day 12 if needed.

Results

Table (1): Distribution of the studied patient according to mannitol intake and neutropenic fever

	Non-mannitol group(n=20)		Mannitol group(n=20)		p value
Neutropenic fever	N	%	N	%	
Absent	9	45.0	18	90.0	X^2=9.231
Present	11	55.0	2	10.0	p=0.002*

Table (2): Distribution of the studied patient according to mannitol intake and blood culture at day 1, day 7 and day 12

	Non-mannitol group (n=20)		Mannitol group (n=20)		p value
	N	%	N	%	
Blood culture at day 1					
Candida	0	0.0	1	5.0	X^2=2.000
Klebseilla	1	5.0	0	0.0	p^{MC}=1.000
No growth	19	95.0	19	95.0	
Blood culture at day 7					
Candida	0	0.0	1	5.0	X^2=5.029
E.coli EBSL positive	1	5.0	0	0.0	p^{MC}=1.000
E.coli	0	0.0	1	5.0	
Klebseilla MDR	1	5.0	0	0.0	
Pseudomonas	1	5.0	0	0.0	
No growth	17	85.0	18	90.0	
Blood culture at day 12					
E.coli EBSL positive	1	5.0	0	0.0	X^2=8.960
E.coli	2	10.0	0	0.0	p^{MC}=0.060
Klebseilla	3	15.0	0	0.0	
Pseudomonas	1	5.0	0	0.0	
No growth	4	20.0	4	20.0	
Not done	9	45.0	16	80.0	

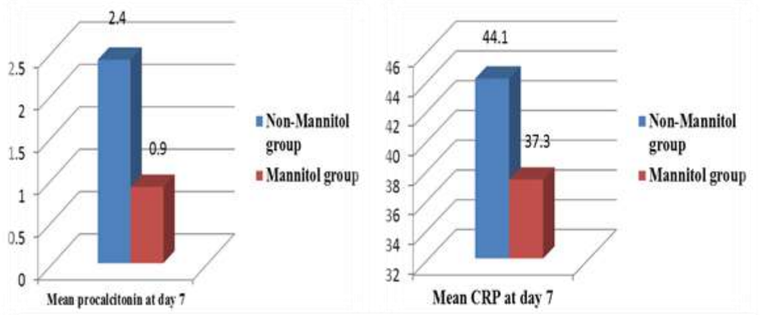

Figure (1-2): Distribution of the studied patient according to mannitol intake CRP and procalcitonin at day 7

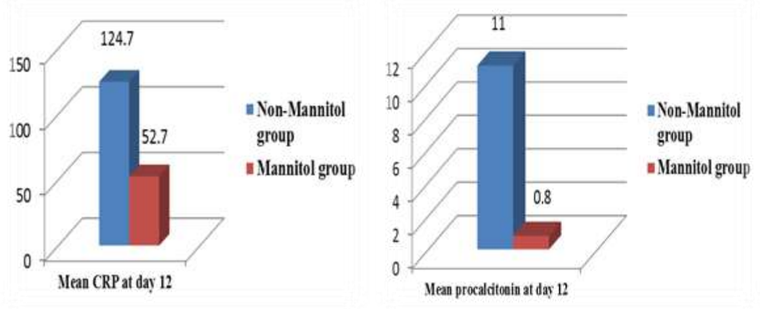

Figure (3-4): Distribution of the studied patient according to mannitol intake, CRP and procalcitonin at day 12

Conclusion

Our study showed statistically significant differences in incidence of febrile neutropenia, regarding: APACHE II score at both day 7 and 12, in CRP and PCT at day 12. Gram-negative (GN) bacteremias in neutropenic patients were associated with high rate of mortality.