

EFFECT OF MEDITERRANEAN DIET ON INCIDENCE AND SEVERITY OF INFECTION IN ACUTE MYELOID LEUKEMIA
PATIENTS UNDERGOING INDUCTION CHEMOTHERAPY

Nadia El Sayed Zaki, Aida Aly Nazier, Mayada Ali Moussa, Dalia Khamis El Deeb,* Mina Fouad Fahim Soryal
Department of Internal Medicine, Department of Community Medicine,* Faculty of Medicine, Alexandria University.

INTRODUCTION

Acute myeloid leukemia (AML) is an aggressive subtype of leukemia that results from genetic mutations in myeloid progenitor cells, disrupting normal blood cell development. These changes cause immature cells to accumulate in the bone marrow and spread to other tissues. AML treatment involves aggressive chemotherapy tailored to cytogenetics, risk stratification and performance status of the patients. Febrile neutropenia (FN) is a significant complication frequently linked to chemotherapy. The repercussions of FN can involve dose reductions, treatment delays, and a considerable effect on morbidity and mortality. In leukemia patients, malnutrition arises through various mechanisms, in addition delays in providing appropriate nutritional support exacerbate the problem of malnutrition in cancer patients. Maintaining good nutritional status during induction chemotherapy is associated with shorter hospital stays and improved outcome. Nutritional interventions have the potential to reduce chemotherapy-induced inflammation and metabolic dysfunction, and lower oxidative stress. Mediterranean diet, with its focus on nutrient-dense, anti-inflammatory foods, could offer potential benefits for AML patients undergoing induction chemotherapy. This dietary pattern is particularly appealing due to its accessibility, adaptability, and lack of strict restrictions.

AIM OF THE WORK

The aim of this work was to study the influence of Mediterranean diet on the incidence and severity of infection and mortality in adult Egyptian acute myeloid leukemia patients undergoing standard induction chemotherapy.

PATIENTS AND METHODS

This study recruited 70 patients with newly diagnosed acute myeloid leukemia (AML) aged between 18 and 60, admitted to the Hematology Unit at Alexandria Main University Hospital. Participants were divided into two groups: Group I (n=35) received Mediterranean diet, while Group II (n=35) followed the regular hospital-provided diet.

All patients were eligible for standard induction chemotherapy and had no significant comorbidities or contraindications. Patients were subjected to comprehensive clinical evaluations and laboratory investigations such as complete blood count, liver and kidney function tests, bone marrow examination, immunophenotyping, C-reactive protein (CRP), procalcitonin (PCT) assay, and blood cultures to detect sepsis. The Mediterranean diet was administered with precise portioning. We evaluated the impact of dietary intervention on nutritional status, infection rates, sepsis markers, and clinical outcomes in AML patients, potentially offering a strategy to enhance immune function, improve supportive care, and reduce complications during induction chemotherapy in AML patients.

RESULTS

Table 1: Comparison between the two studied groups according to CRP & PCT before induction chemotherapy

1 st	Group I (n = 35)	Group II (n = 35)	Test of Sig.	p
CRP mg/dl				
Min. – Max.	1.50 – 232.0	1.80 – 432.0	U= 610.0	0.977
Mean ± SD.	64.30 ± 66.02	67.33 ± 84.47		
Median (IQR)	43.0 (16.0 – 76.0)	31.0 (17.50 – 85.0)		
PCT ug/L				
Min. – Max.	0.06 – 7.0	0.10 – 10.0	t= 1.202	0.234
Mean ± SD.	0.43 ± 1.20	0.93 ± 2.08		
Median (IQR)	0.20 (0.10 – 0.30)	0.30 (0.10 – 0.40)		

IQR: Inter quartile range SD: Standard deviation. U: Mann Whitney test, t: Student t test
p: p value for comparing between the two studied groups. Statistically significant at p ≤ 0.05

Table 2: Comparison between the two studied groups according to CRP & PCT during neutropenic fever.

	Group I (n = 35)	Group II (n = 35)	Test of Sig.	p
CRP mg/dl				
Min. – Max.	2.0 – 370.0	87.0 – 380.0	U= 267.50*	<0.001*
Mean ± SD.	153.91 ± 90.47	250.23 ± 84.91		
Median (IQR)	153.0 (81.0 – 212.50)	250.0 (182.0 – 320.0)		
PCT ug/L				
Min. – Max.	0.10 – 12.0	0.20 – 9.0	t= 0.299	0.766
Mean ± SD.	3.27 ± 3.37	3.49 ± 2.85		
Median (IQR)	1.70 (0.60 – 4.50)	2.60 (1.05 – 6.0)		

IQR: Inter quartile range SD: Standard deviation t: Student t-test. U: Mann Whitney test
p: p value for comparing between the two studied groups. *: Statistically significant at p ≤ 0.05

Table 3: Comparison between the two studied groups according to days of fever and days of neutropenia

	Group I (n = 35)	Group II (n = 35)	t	p
Days of fever				
Min. – Max.	0.0 – 8.0	4.0 – 11.0	5.489*	<0.001*
Mean ± SD.	5.20 ± 1.98	7.49 ± 1.46		
Median (IQR)	5.0 (4.0 – 6.50)	8.0 (7.0 – 8.0)		
Days of neutropenia				
Min. – Max.	13.0 – 28.0	14.0 – 22.0	0.000	1.000
Mean ± SD.	18.49 ± 3.11	18.49 ± 1.72		
Median (IQR)	18.0 (17.0 – 20.0)	19.0 (18.0 – 19.50)		

IQR: Inter quartile range SD: Standard deviation
t: Student t-test.
p: p value for comparing between the two studied groups.
*: Statistically significant at p ≤ 0.05

CONCLUSION

From this study, we concluded that, compared to regular diet.

- Patients on the Mediterranean diet experienced significantly lower CRP levels during febrile neutropenia.
- The duration of fever was significantly reduced in the patients who received Mediterranean diet.
- Serum albumin level was higher in AML patients on Mediterranean diet at day 28 of induction chemotherapy.
- The most common organism detected was *Klebsiella pneumoniae* and the most common source of infection was cannula site infections.