RESULTS

According to the Outcome:

Table (1): Demographic features of the studied patients.

Characteristics	Alive (n=31)	Died (n=8)	P value
Age (yrs)	5.23 ± 3.99	4.53 ± 3.37	NS

Values are expressed as number (%).
NS= Not significant (p> 0.05).

Table (2): Demographic features of the studied patients.

Characteristics	Male (n= 27)	Female (n= 12)	P value
Alive (n= 31)	22 (71%)	9 (29%)	0.05
Died (n= 8)	5 (62.5%)	3 (37.5%)	NS

Values are expressed as number (%).
P< 0.05= significant; NS= Not significant (p> 0.05).

As appeared in the table no. 2 the over all survival was higher in the males more than females.

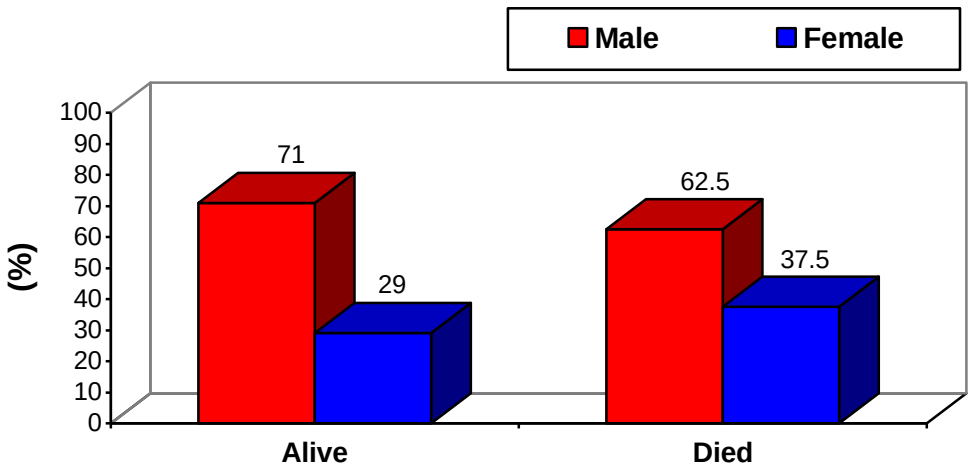

Fig. (3): Distribution of sex in the patients according to the outcome.

Table (3): Residence of the patients.

Characteristics	Rural	Semiurban	Urban	P-value
Alive (n= 31)	15 (48.4%)	6 (19.4%)	10 (32.3%)	NS
Died (n= 8)	2 (25%)	2 (25%)	4 (50%)	NS

Values are expressed as number (%).

NS= Not significant (p> 0.05).

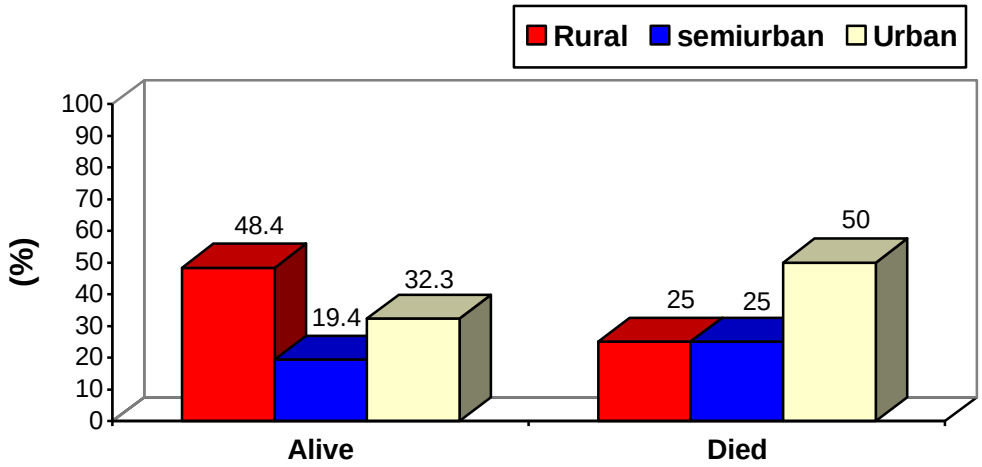

Fig. (4): Distribution of residences in our patients.

As shown in the table (3) residence had no statistical importance but it showed that the highest survival rate were patients from rural areas.

Table 4: Admission features of the studied patients.

Characteristics	Alive (n= 31)	Died (n= 8)	P value
Duration of neutropenia (days)	12.16 ± 6.92	23.00 ± 5.86	< 0.01
Initial antibiotics:			
Cefoprazone/Amikacin	31 (100%)	5 (62.5%)	< 0.01
Meropenem	0 (0%)	3 (37.5%)	
Line change (yes)	19 (61.3%)	8 (100%)	< 0.05
Day 7 fever (yes)	8 (25.8%)	8 (100%)	< 0.01

Values are expressed as mean ± SD or number (%).

p< 0.05= significant; p< 0.01= highly significant.

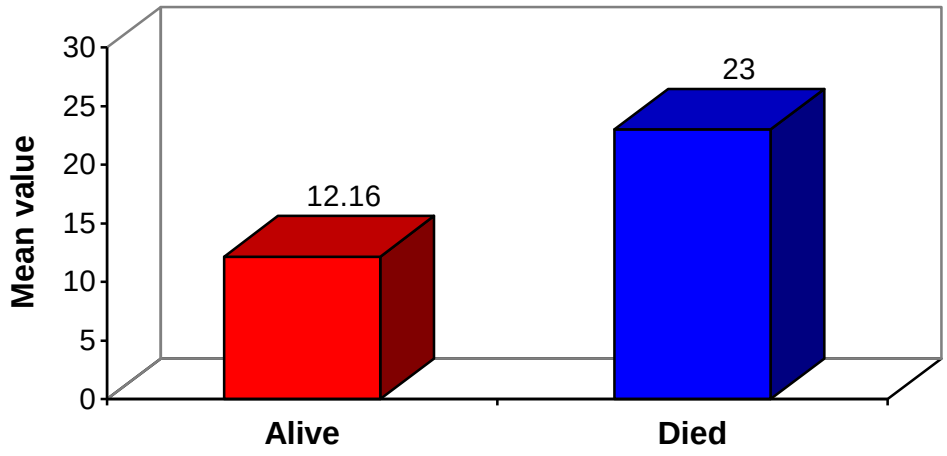

Fig. (5): Duration of nutropenia (days) in the two studied groups classified according to line outcome.

As shown in Fig. (5) the study revealed that patients with prolonged neutropenia more than 15 days most probably end as mortality versus that the entire alive patient had shorter neutropenic duration.

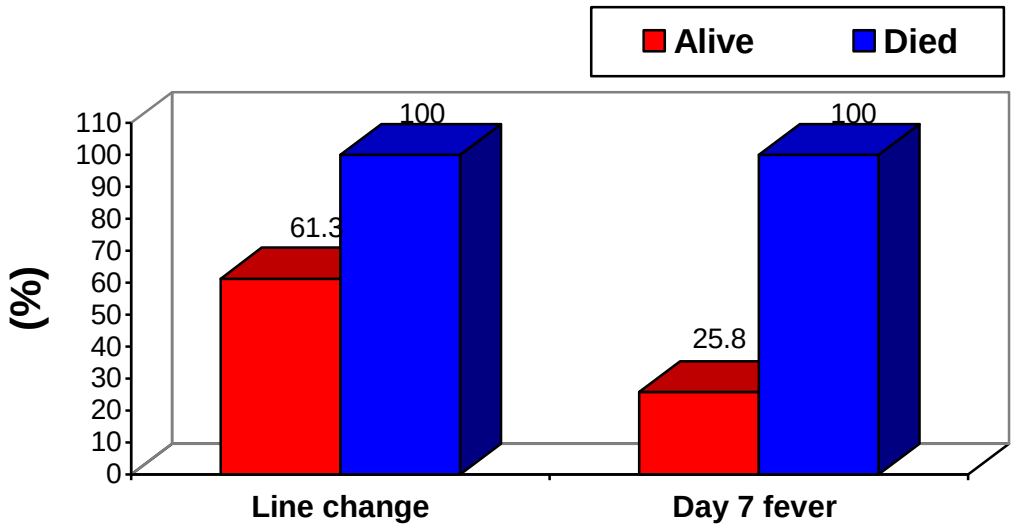

Fig. (6): Antibiotic shift and day 7 fever in the two studied groups classified according to line outcome.

All of the Patients whom ended up dead from the infection had fever at day 7 and 25.8% of the alive patient were still febrile at day 7.

Table (5): Initial diseases of the studied patients.

Characteristics	ALL	AML	NHL	P-value
Alive (n= 31)	14 (45.2%)	11 (35.5%)	6 (19.4%)	NS
Died (n= 8)	3 (37.5%)	4 (50%)	1 (12.5%)	NS

Values are expressed as number (%).
NS= Not significant (p> 0.05).

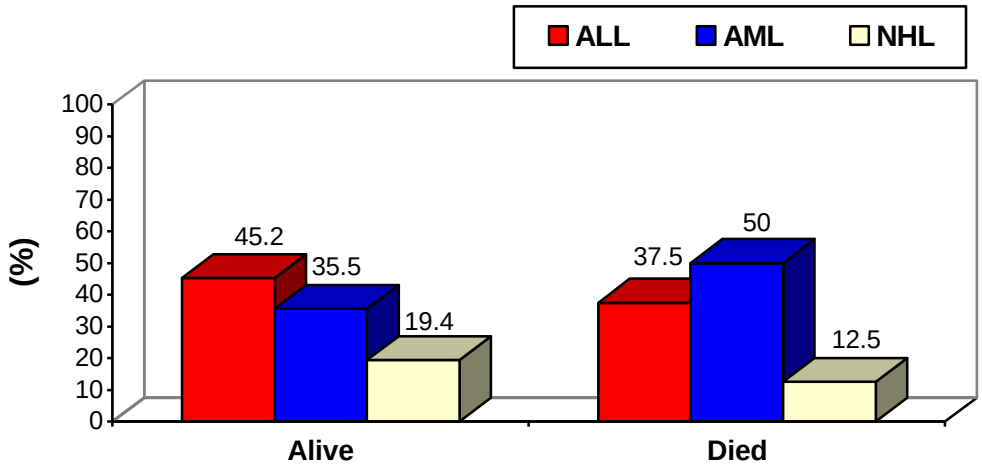

Fig. (7): Disease types in the three studied groups classified according to line outcome.

AML as an initial disease showed the highest mortality rate of 50% while the NHL were the least with 12.5% and the highest survival rate with 45.5% for ALL.

Table (6): Laboratory results of the studied patients.

Characteristics	Alive (n= 31)	Died (n= 8)	P-value
Culture & Sensitivity:			
Peripheral	29 (93.5%)	6 (75%)	NS
Peripheral+central	2 (6.5%)	2 (25%)	
ICU admission (yes)	5 (16.1%)	8 (100%)	< 0.01
Prophylactic antibiotic	15 (148.4%)	2 (25%)	NS

Values are expressed as mean ± SD or number (%).

NS= Not significant (p> 0.05); p< 0.01= highly significant.

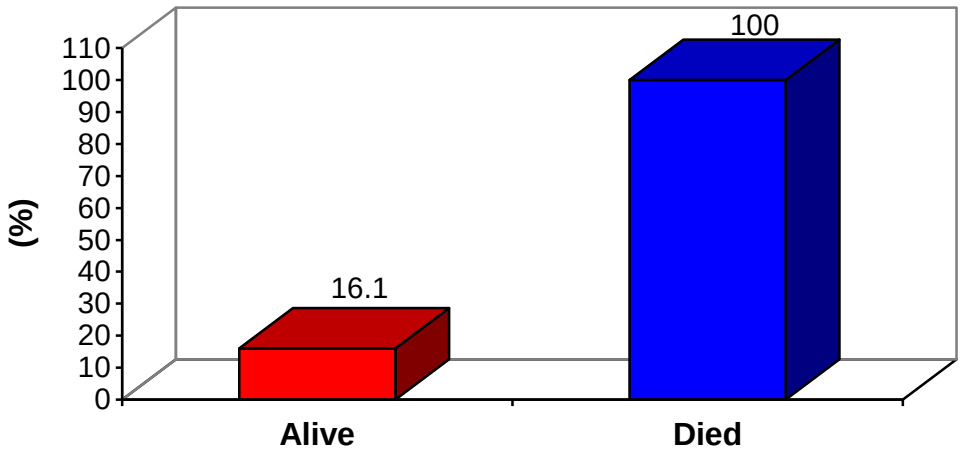

Fig. (8): ICU admission in the two studied groups classified according to line outcome.

100% of the dead patients needed ICU admission while just 16% of the patients alive needed that.

Table (7): Type of organism in the two studied groups.

Type of Organism	Alive (n= 31)	Died (n= 8)	P-value
Acinetobacter (n=4)	4 (12.9%)	0 (0%)	NS
E-coli (n=9)	6 (19.4%)	3 (37.5%)	
Enterobacter (n=2)	1 (3.2%)	1 (12.5%)	
Klebsiella (n=11)	9 (29.0%)	2 (25%)	
Pseudomonas (n=11)	9 (29.0%)	2 (25%)	
Salmonella (n=1)	1 (3.2%)	0 (0%)	
Stenotrophomonas(n=1)	1 (3.2%)	0 (0%)	

Values are expressed as number (%).
NS= Not significant (p> 0.05).

Klebsiella and Pseudomonas were the most cultured organisms of all gram negative although the Enterobacter was the highest in mortality as 50% of the cultured patients died followed by E-coli with 33.3%.

Table (8): The correlation between the causative organism and outcome.

Type of organism	Alive	Died	P-value
Acinetobacter (n=4)	4 (100%)	0 (0%)	NS
E-coli (n=9)	6 (66.7%)	3 (33.3%)	NS
Enterobacter (n=2)	1 (50%)	1 (50%)	NS
Klebsiella (n=11)	9 (81.8%)	2 (18.2%)	0.05
Pseudomonas (n=11)	9 (81.8%)	2 (18.2%)	0.05
Salmonella (n=1)	1 (100%)	0 (0%)	NS
Stenotrophomonas (n=1)	1 (100%)	0 (0%)	NS

Values are expressed as number (%).
NS= Not significant (p> 0.05); p< 0.05= significant.

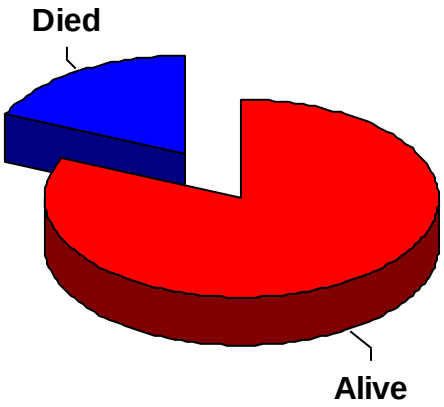

Fig. (9): Distribution of *Klebsiella* or *Pseudomonas* in the two studied groups classified according to line outcome.

Table (9): Type of chemotherapy in the two studied groups.

Characteristics	Total number of patients (n= 39)
MTX + 6MP	2 (6.5%)
HDMTX	3 (9.7%)
High dose ARAC	22 (56.4%)
VCR + DOX	10 (25.6%)
Cyclo+MTX+ DOX	2 (6.5%)

Values are expressed as number (%).

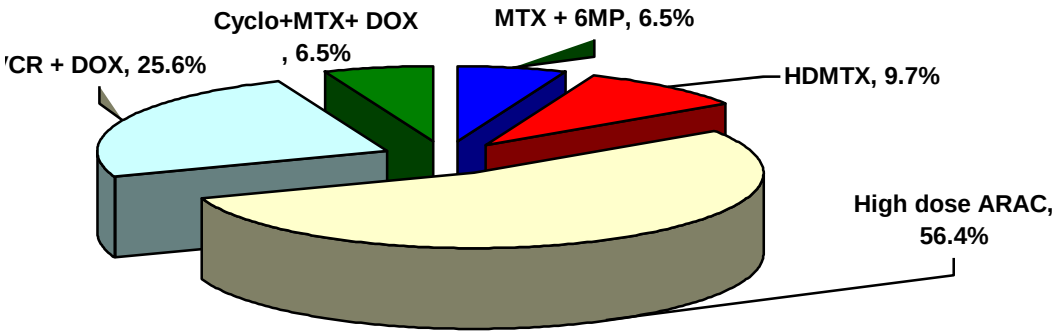

Fig. (10): **Distribution of received chemotherapy.**

The type of chemotherapy received has no statistically significant but we found out that 56.4% of our patients were post receiving high dose ARAC then next comes VCR=DOX with 25.6%.

Table (10): Chemotherapy received prior episode.

Characteristics	ARAC	VCR/DOX	Others	P-value
Alive (n= 31)	16 (51.6%)	8 (25.8%)	7 (22.6%)	NS
Died (n= 8)	6 (75%)	2 (25%)	0 (0%)	NS

Values are expressed as number (%).
NS= Not significant (p> 0.05).

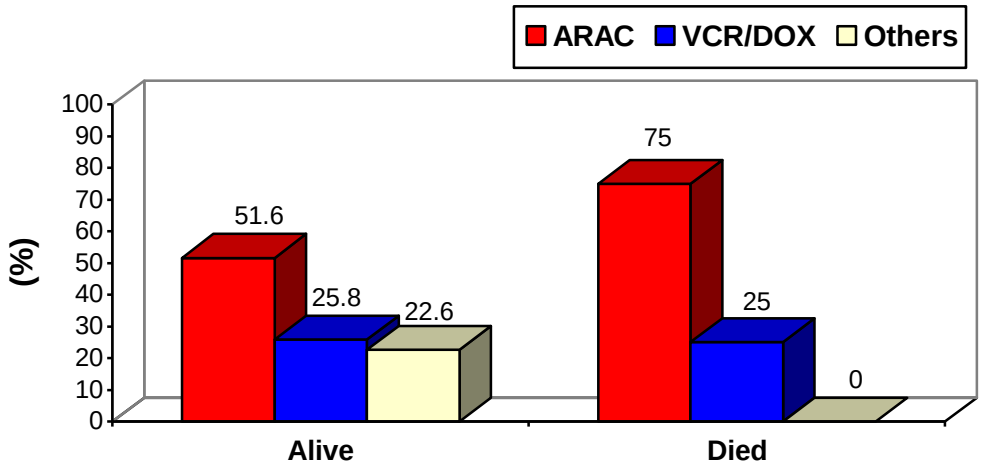

Fig. (11): Distribution of received chemotherapy.

As shown in the above table the only two chemo protocol responsible for mortality were ARAC by 75% and then VCR=DOX by 25%.

Table (11): Antifungal types used in the two studied groups.

Characteristics	Alive (n= 31)	Died (n= 8)	P-value
Fluconzole	3 (9.7%)	0 (0%)	
Fluconzole+AmphoB	3 (9.7%)	1 (12.5%)	
AmphoB	16 (51.6%)	6 (75%)	NS
AmphoB +Liposomal AmphoB	0 (0%)	1 (12.5%)	
Voliconazole	1 (3.2%)	0 (0%)	
No	8 (25.8%)	0 (0%)	

NS= Not significant (p> 0.05).

According to ICU Admission:

Table (12): Demographic features of the studied patients.

Characteristics	No (n= 26)	Yes (n= 13)	P-value
Age (yrs)	5.00 ± 3.70	5.25 ± 4.26	NS

Values are expressed as number (%).
NS= Not significant (p> 0.05).

Table (13): Demographic features of the studied patients.

Characteristics	Male (n= 27)	Female (n= 12)	P-value
PICU Admission (n= 13)	8 (61.5%)	5 (38.5%)	NS
Not Admitted (n= 26)	19 (73.1%)	7 (26.9%)	0.05

Values are expressed as number (%).
P< 0.05= significant; NS= Not significant (p> 0.05).

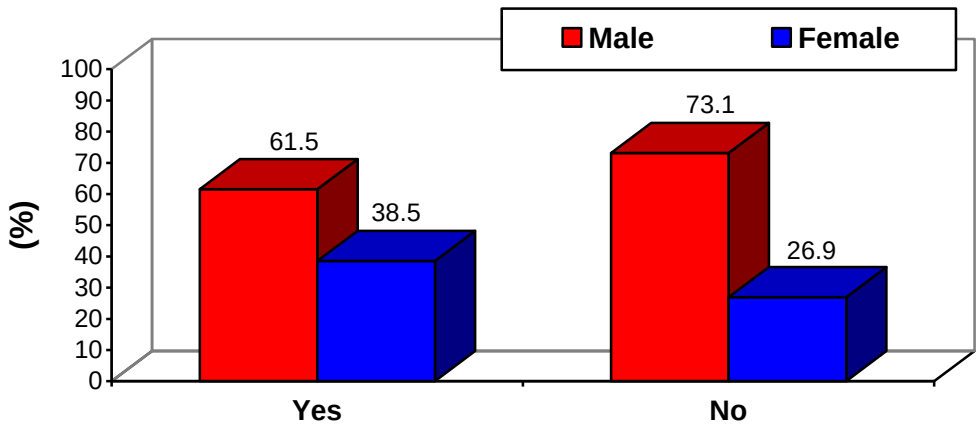

Fig. (12): Relation of sex in PICU admission.

Table (14): Residence of admitted patients.

Characteristics	Rural	Semi urban	Urban	P-value
Yes (n= 13)	3 (23.1%)	4 (30.8%)	6 (46.2%)	NS
No (n= 26)	14 (53.8%)	6 (23.1%)	6 (23.1%)	NS

Values are expressed as mean ± SD or number (%).
NS= Not significant (p> 0.05).

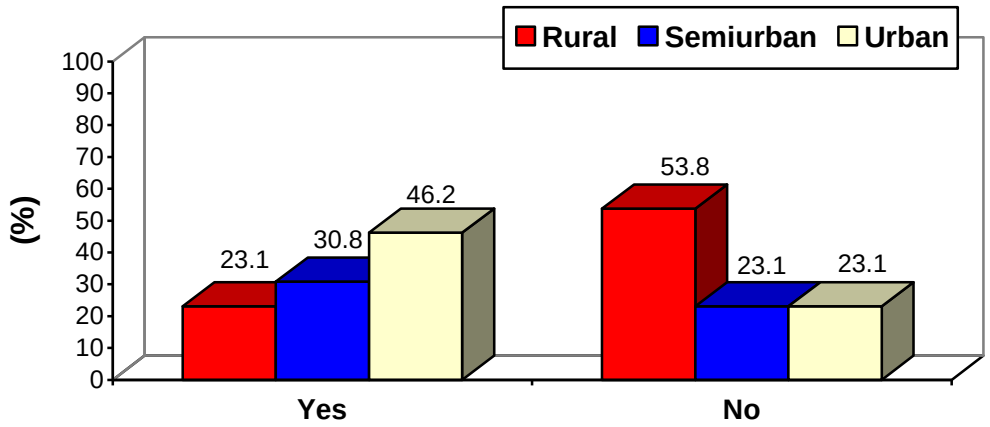

Fig. (13): Distribution of admitted patient's residency.

Regarding origin of the patients, urban origin showed 46.2% of the PICU admissions.

Table (15): Admission features of the studied patients.

Characteristics	No (n= 26)	Yes (n= 13)	P- value
Duration of neutropenia (days)	12.04 ± 7.29	19.08 ± 7.45	< 0.01
Initial antibiotics: Cefoprazone/Amikacin Meropenem	 26 (100%) 0 (0%)	 10 (76.9%) 3 (23.1%)	< 0.05
Line change (yes)	14 (53.8%)	13 (100%)	< 0.01
Day 7 fever (yes)	5 (19.2%)	11 (84.6%)	< 0.01
Prophylactic antibiotic	14 (53.8%)	3 (23.1%)	NS

Values are expressed as mean ± SD or number (%).
p< 0.05= significant; p< 0.01= highly significant.

All patients who needed ICU admission had neutropenic period more than 15days and needed line change in treatment and finally 84.6% were still febrile at day 7 of treatment.

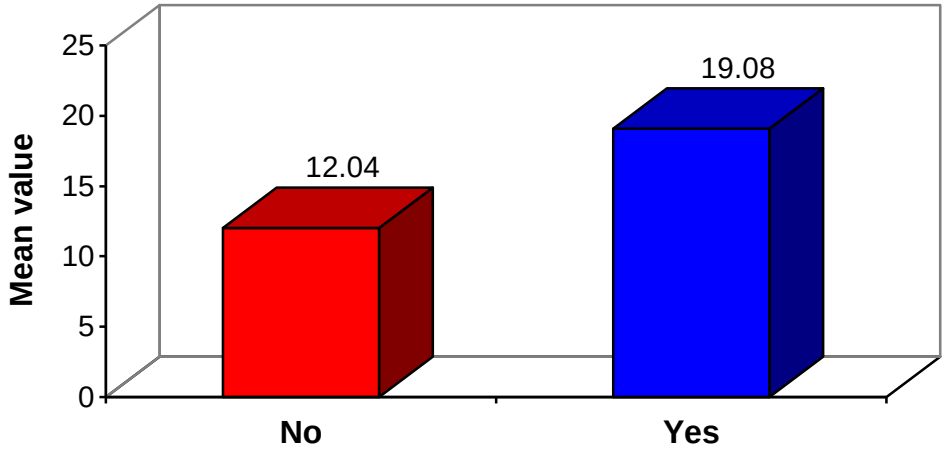

Fig. (14): Duration of nutropenia (days) in the two studied groups classified according to ICU admission.

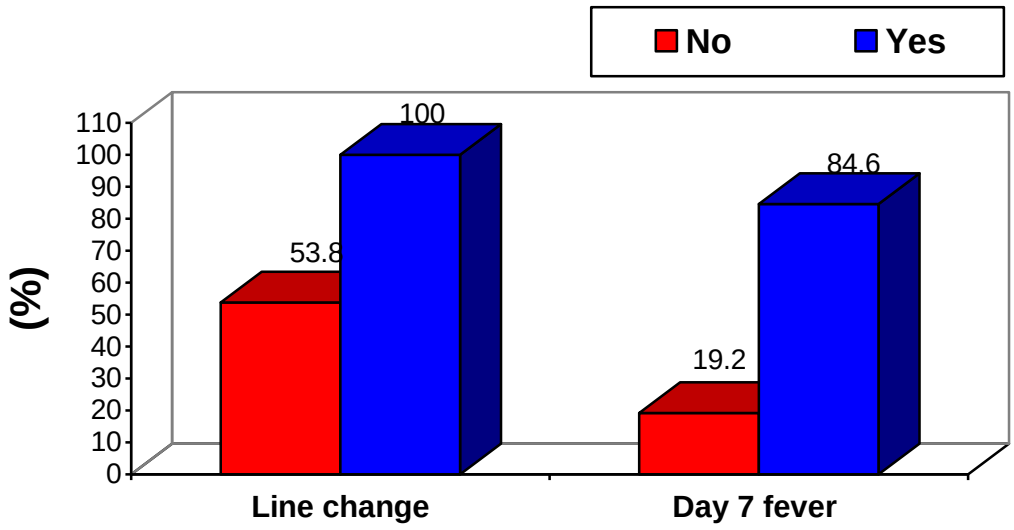

Fig. (15): Antibiotic shift and day 7 fever in the two studied groups classified according to ICU admission.

Table (16): **Initial diagnosis of admitted patients.**

Characteristics	ALL	AML	NHL	P-value
PICU Admission (n= 13)	7 (53.8%)	5 (38.5%)	1 (7.7%)	NS
Not Admitted (n= 26)	10 (38.5%)	10 (38.5%)	6 (23.1%)	NS

Values are expressed as mean ± SD or number (%).
NS= Not significant (p> 0.05).

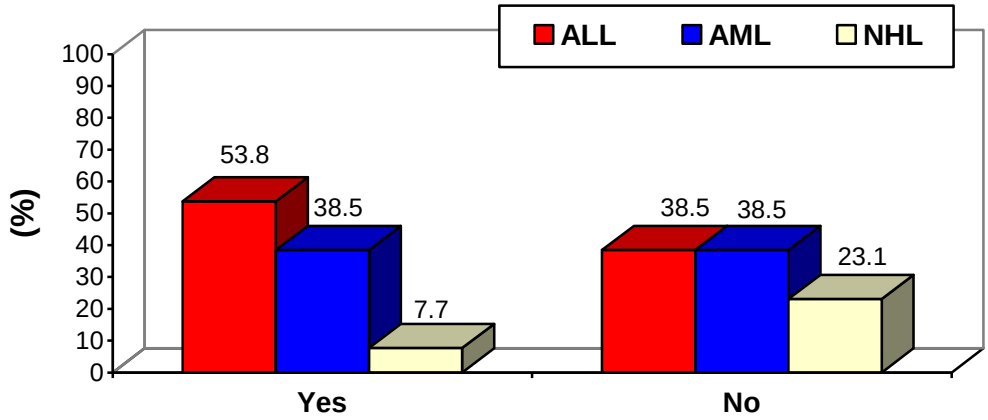

Fig. (16): Disease types in the three studied groups classified according to ICU admission.

ALL disease came in the first rank of PICU admission by 53.8%, while NHL came last with only 7.7%.

Table (17): Laboratory results of the studied patients.

Characteristics	No (n= 26)	Yes (n= 13)	P value
Culture & Sensitivity			
Peripheral	25 (96.2%)	10 (76.9%)	NS
Peripheral+central	1 (3.8%)	3 (23.1%)	

Values are expressed as mean ± SD or number (%).
NS= Not significant (p> 0.05); p< 0.01= highly significant.

Table (18): Type of organism in the two studied groups.

Type of organism	No (n= 26)	Yes (n= 13)	P-value
Acinetobacter (n=4)	4 (15.4%)	0 (0%)	NS
E-coli (n= 9)	5 (19.2%)	4 (30.8%)	
Enterobacter (n= 2)	1 (3.8%)	1 (7.7%)	
Klebsiella (n= 11)	6 (23.1%)	5 (38.5%)	
Pseudomonas (n= 11)	8 (30.8%)	3 (23.1%)	
Salmonella (n= 1)	1 (3.8%)	0 (0%)	
Stenotrophomonas (n=1)	1 (3.8%)	0 (0%)	

NS= Not significant (p> 0.05).

Table (19): The morbidity of the organisms in the two studied groups.

Type of organism	No	Yes	P-value
Acinetobacter (n=4)	4 (100%)	0 (0%)	NS
E-coli (n= 9)	5 (55.6%)	4 (44.4%)	NS
Enterobacter (n= 2)	1 (50%)	1 (50%)	NS
Klebsiella (n= 11)	6 (54.5%)	5 (45.5%)	NS
Pseudomonas (n= 11)	8 (72.7%)	3 (27.3%)	NS
Salmonella (n= 1)	1 (100%)	0 (0%)	NS
Stenotrophomonas (n=1)	1 (100%)	0 (0%)	NS

NS= Not significant (p> 0.05).

Regarding table no.18 we find the Klebsiella come in the first place in organisms resulting in ICU admission 38.5% followed by E-coli 30.8% then Pseudomonus 23.1%.

Table (20): Type of chemotherapy in the two studied groups.

Characteristics	ARAC	VCR/DOX	P-value
Yes (n= 13)	8 (61.5%)	5 (38.5%)	NS

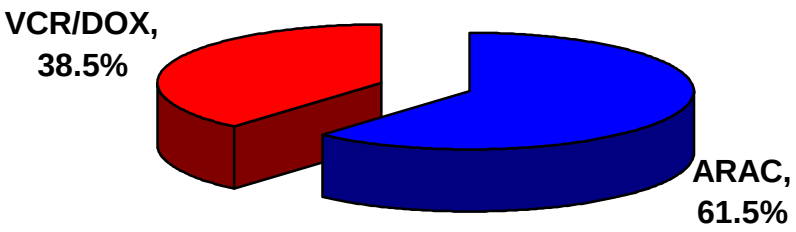

Fig. (17): Distribution of chemotherapy received prior admission.

As seen in table High dose ARAC was the highest chemotherapy resulting in ICU admission in episodes of fever and neutropenia.

Table (21): Clinical presentation upon admission.

Characteristics	No (n= 26)	Yes (n= 13)	P-value
Diarrhea	6 (23.1%)	12 (92.3%)	< 0.01
Cough	9 (34.6%)	4 (30.8%)	NS
Rigors	7 (26.9%)	3 (23.1%)	NS
Vomiting	4 (15.4%)	5 (38.5%)	NS
Normal/hypotensive	21/5 (80.8%/19.2)	9/4 (69.2%/30.8%)	NS
Normal/tachycardia	15/11 (57.7%/42.3%)	10/3 (76.9%/23.1%)	NS
Normal weight	6 (23.1%)	5 (38.5%)	NS
Under weight	20(76.9%)	8(61.5%)	NS

NS= Not significant (p> 0.05)
Diarrhea was accompanied symptom of 92.3% of all the admitted patients

Table (22): Antifungal types used in the two studied groups.

Characteristics	No (n= 26)	Yes (n= 13)	P- value
Fluconzole	3 (11.5%)	0 (0%)	NS
Fluconzole+AmphoB	2 (7.7%)	2 (15.4%)	
AmphoB	14 (53.8%)	8 (61.5%)	
AmphoB + Liposomal AmphoB	0 (0%)	1 (7.7%)	
Voliconazole	0 (0%)	1 (7.7%)	
No	7 (26.9%)	1 (7.7%)	

NS= Not significant (p> 0.05).