

CHAPTER IV

RESULTS

RESULTS

I. Clinical findings

The clinical findings in the twenty-five cases submitted to the present study are presented in table (7) and can be summarized as follows:

- **Fever** : noticed in 76 % of cases.
- **Pallor** : was present in all cases (100 %).
- **Purpura** : Occured in 68 % of cases.
- **Splenomegaly** : present in 92 % of cases.
- **Hepatomegaly** : present in 88 % of cases.
- **Lymphadenopathy** : occured in 64 % of cases.
- **Bone ache and joint pain** : noticed in 36 % of cases.

As regards the kidneys, C.N.S. and testes they were clinically free at time of diagnosis in all patients.

The per cent of occurrence of various clinical findings in our cases is shown in fig (2).

Table (7): Clinical Findings In Children with ALL at the Time of Diagnosis.

Case No.	Sex	Age (yrs)	Fever	Pallor	Spleen (Cm)	Liver (Cm) M.C.L	Lympha- deno- pathy	Purpra	Bone and pain
1	M	6	+	+	3	3	-	+	-
2	M	3	+	+	7	5	+	-	+
3	M	4	-	+	5	0	-	+	-
4	F	4	+	+	2.5	2	+	-	+
5	F	7	+	+	0	3.5	+	+	-
6	M	9	+	+	7	4	+	-	-
7	F	5	-	+	4	4	-	+	-
8	F	10	-	+	4.5	3	+	+	+
9	F	8	+	+	3	0	+	-	-
10	M	6	+	+	4	2.5	-	+	-
11	F	3	+	+	5	3	+	-	-
12	M	7	+	+	0	4.5	-	+	+
13	F	6	+	+	4	6	-	+	+
14	M	4	-	+	5	3	+	+	-
15	M	7	+	+	7	6	+	-	+
16	M	4	+	+	4	0	-	+	-
17	F	5	+	+	2.5	3	+	+	-
18	M	3	-	+	7	3	-	+	+
19	M	12	+	+	3	4	+	-	-
20	M	6	+	+	8	6	+	+	+
21	F	4	+	+	6	6	+	-	-
22	M	3	-	+	3	4	+	+	-
23	F	10	+	+	6	4	-	+	-
24	M	2	+	+	3.5	4	+	+	-
25	F	8	+	+	8	3	+	+	+
Percent (%)			76	100	92	88	64	68	36

+ = Present - = Absent

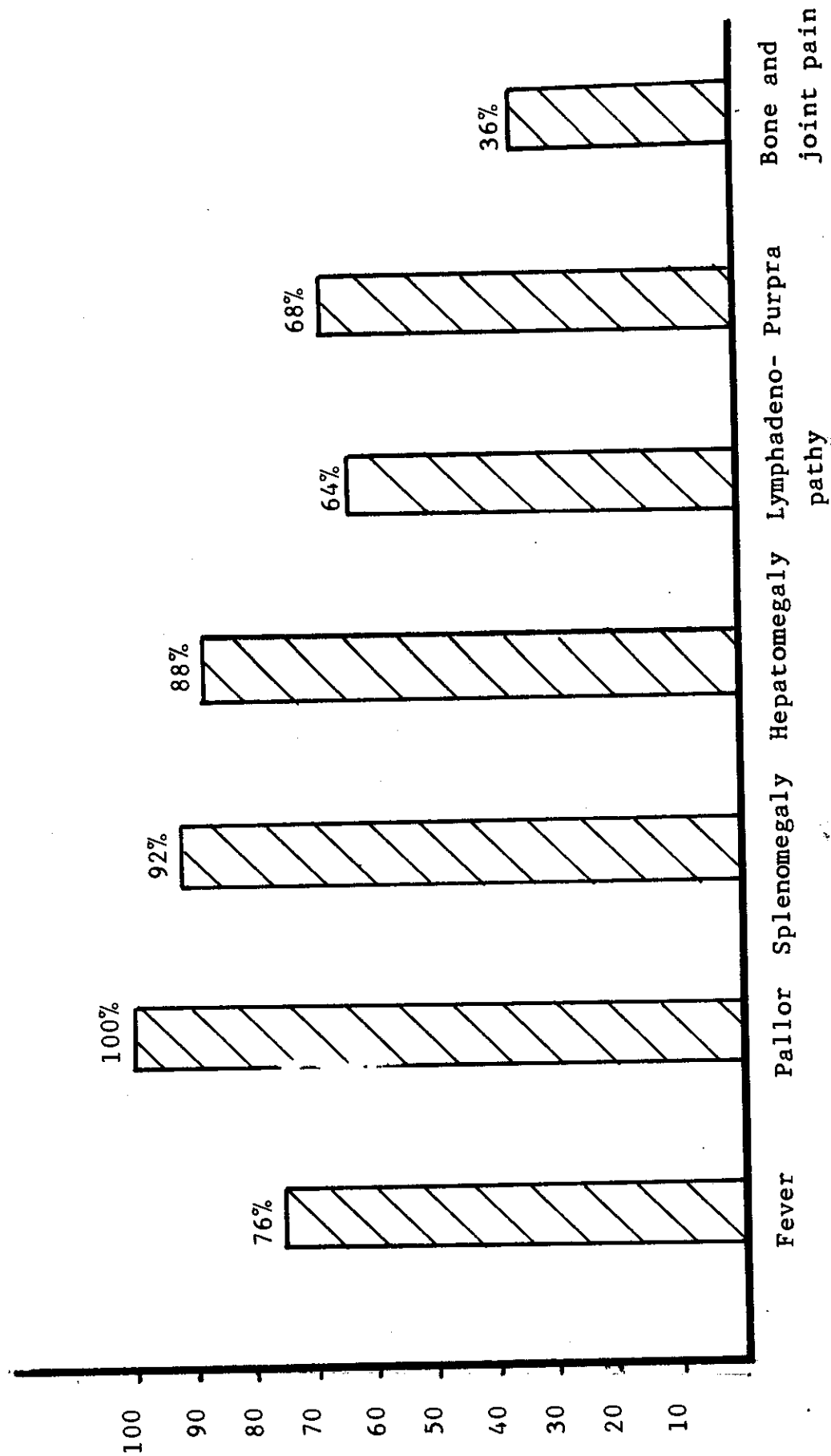


Fig.(2) : Percentage of occurrence of various clinical findings in cases with ALL at the time of diagnosis

II. Haematological findings

1. Peripheral blood picture:

The haematological data of individual cases are shown in table 8 (group I), table 9 (group II), and table 10 (group III). The data can be summarized as follows:

Group I: (Children with ALL at time of diagnosis).

- All cases submitted to the present work (25 cases) were found to be anaemic with the mean value of Hb ($6.4 \pm 1.54\text{g\%}$) and range of (4 - 8.53 %).
- The leucocytic count of the cases had a mean value of ($33.4 \pm 31. \text{)}$ with a range of ($2.5 - 107 \times 10^3/\text{Cmm}$). Sixteen cases (64 %) showed leucocytosis while leucopenia was found in 5 cases (20%).
- Blast cells were proved in 100 % of our cases with mean of ($20.2 \pm 10.85 \text{ %}$) and a range of (4 - 45 %).
- Lymphocytosis was present in all cases (100 %) with a mean of ($65.0 \pm 10.98 \text{ %}$) and a range of (41 - 83%).
- Platelet count was markedly diminished in all cases with a mean of ($48 \pm 22.36 \text{ %}$) and a range of ($30 - 90 \times 10^3/\text{Cmm}$).

- Lymphocytosis was present in all cases (100%) with a mean of (65.2 + 11.27%) and a range of (41 - 84%).
- Platelet count was markedly diminished in all cases with a mean of (48 + 22.36%) and a range of (30 90 X 10³/Cmm).

Group II (Cases 72 hours after initiation of induction therapy (25 cases).

- Hb level improvement was noticed but patients were still anaemic. The mean is (6.9 + 1.53) and the range was (4.5 - 9.5g%).
- The mean leucocytic count was (15.0 + 9.44) with a range of (5.5 - 60 X 10³/Cmm).leucocytosis was still present in eleven cases.
- Blast cells were still present with a mean of (10.8 + 6.43%) and range of (2 22%).
- Lymphocytosis was still found with a mean of (59.5 + 8.22) and a range of (45 - 75 %).
- Platelet count was increased in comparison to Group I. The mean was (68.8 + 15.58) with a range of 40-95X10³/Cmm.

Group III [Cases after induction of remission (18 cases)]

- Hb present with a mean of (10.7 + 1.44 %) and a range of (8.5 - 14 g%).
- Total leucocytic count had a mean of (8.6 + 2.65) and range of (4.8 - 13 X 10³/Cmm).

- Lymphocytosis was present in all cases (100%) with a mean of (65.2 + 11.27%) and a range of (41 - 84%).

- Platelet count was markedly diminished in all cases with a mean of (48 + 22.36%) and a range of (30 90 X 10³/Cmm).

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- Hb level improvement was noticed but patients were still anaemic. The mean is (6.9 + 1.53) and the range was (4.5 - 9.5g%).

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- Lymphocytosis was still found with a mean of (59.5 + 8.22) and a range of (45 - 75 %).

- Platelet count was increased in comparison to Group I. The mean was (68.8 + 15.58) with a range of 40-95X10³/Cmm.

Group III [Cases after induction of remission (18 cases)]

- Hb present with a mean of (10.7 + 1.44 %) and a range of (8.5 - 14 g%).

- Total leucocytic count had a mean of (8.6 + 2.65) and range of (4.8 - 13 X 10³/Cmm).

- All cases showed no blast cells (0%) in peripheral blood smears.
- Lymphocytes were found with a mean of 39.9 ± 2.76 and a range of 37-46 %.
- The mean platelet count was (230.5 ± 49.61) and a range of $150 - 300 \times 10^3/\text{Cmm}$.

2. Myelogram:

Myelogram data of individual cases are presented in tables (11) and (12).

At time of diagnosis (group I) the mean value of the total nucleated cells in myelogram was (378.8 ± 160.08) with a range of $(180 - 830 \times 10^3)$. The percentage of blast cells had a mean value of $(40.2 \pm 13.34\%)$ and a range of $(25-72 \%)$.

The myelograms of cases in remission (group III) were nearly within normal. The mean of TCNC was (58.4 ± 19.62) with a range of $(40 - 90 \times 10^3)$. Blast cells had a mean of $(1.2 \pm 0.98\%)$ with a range of $(0-3 \%)$.

Table (8): Peripheral blood picture in group I (cases at time of diagnosis).

Case No.	Hb g%	RBC's $\times 10^6/\text{cm}$	WBC's $\times 10^3/\text{cm}$	Blast cells %	Segmented %			L %	M %	Platelets $\times 10^3/\text{cmm}$
					B	E	N			
1	4.5	2.50	11.0	7	0	0	18	71	4	40
2	7.5	2.52	32.0	14	0	0	17	66	3	70
3	5.0	1.25	7.0	12	0	0	15	73	0	50
4	6.5	2.10	2.5	30	0	0	4	66	0	70
5	5.7	1.82	21.0	32	1	0	13	51	3	30
6	8.0	3.23	92.0	45	0	1	10	41	4	65
7	8.5	3.80	5.0	31	0	2	8	56	3	90
8	4.5	1.85	3.0	4	0	0	23	73	0	40
9	8.5	2.60	45.0	18	0	0	12	70	0	65
10	7.5	2.75	14.0	23	0	0	5	70	2	35
11	5.0	2.01	45.0	19	0	0	18	63	0	60
12	8.0	2.84	93.0	30	0	0	6	62	2	35
13	5.6	1.80	21.5	41	2	5	4	43	5	40
14	6.4	2.15	9.0	29	1	0	10	60	0	35
15	6.0	2.00	2.5	15	0	2	17	60	6	80
16	8.5	2.10	44.0	20	0	0	6	72	2	35
17	4.5	2.50	45.5	12	0	0	18	65	5	45
18	6.9	2.44	69.0	16	0	0	4	80	0	60
19	8.5	3.90	4.0	4	0	2	8	83	3	90
20	4.0	1.50	107.0	15	0	0	5	80	0	40
21	8.0	3.32	12.0	30	0	0	10	56	4	70
22	5.8	2.00	45.0	23	0	0	18	53	6	45
23	4.5	1.70	76.0	11	0	0	20	66	3	60
24	7.5	2.52	3.5	8	0	0	24	64	4	50
25	5.0	1.25	25.0	17	0	0	3	80	0	50
Range	4.5-8.5	1.25-3.90	2.5-107	4 - 45	0-2	0-5	5-24	41-83	0-6	30 - 90
X	6.4	2.4	33.4	20.2	0.2	0.5	11.8	65.0	2.4	48
S.D	1.54	0.74	31.09	10.85	0.47	1.15	6.52	10.98	2.08	22.36

Table (9): Peripheral blood picture in group II (72 hours after initiation of induction therapy).

Case No.	Hb g%	RBC's $\times 10^6/\text{cm}$	WBC's $\times 10^3/\text{cm}$	Blast cells %	Segmented %			L %	M %	Platelets $\times 10^3/\text{cmm}$
					B	E	N			
1	5.5	2.0	7.0	5	0	0	25	64	6	50
2	9.0	3.2	8.0	6	0	1	30	56	7	85
3	6.0	1.7	9.0	8	1	2	17	72	0	55
4	7.5	2.8	11.0	17	0	0	27	55	1	75
5	6.0	1.7	10.0	18	1	4	15	55	7	45
6	7.5	2.6	32.0	18	0	3	30	45	4	80
7	9.0	3.6	13.0	16	0	1	29	48	6	95
8	4.5	2.0	11.0	2	0	0	24	72	2	40
9	8.0	2.5	19.0	5	1	0	34	60	0	75
10	7.5	2.6	8.0	11	0	0	21	63	5	50
11	5.5	2.0	18.0	8	0	1	29	59	3	75
12	9.0	2.9	25.0	20	0	0	26	48	6	70
13	5.5	1.9	9.0	15	2	0	22	54	7	55
14	7.5	2.9	11.0	10	2	6	14	67	1	45
15	6.0	1.8	10.0	6	0	0	28	60	6	95
16	9.5	3.3	19.5	12	1	2	9	69	2	65
17	5.0	1.7	9.5	14	0	0	18	64	4	60
18	6.5	2.5	17.0	7	0	1	34	56	2	80
19	9.5	3.7	8.5	6	0	3	9	75	7	90
20	4.5	1.9	60.0	3	0	0	34	61	2	65
21	7.5	2.7	26.0	22	1	1	7	56	7	70
22	7.0	2.6	40.0	15	0	0	25	53	7	76
23	5.0	2.1	33.5	4	0	0	21	67	8	80
24	7.0	2.8	5.5	4	0	1	44	46	5	75
25	5.5	1.8	8.5	11	0	0	24	62	3	70
Range	4.5-9.5	1.7-3.7	5.5-60	2.22	0-2	0-7	7-34	45-75	0-8	40 - 95
X	6.9	2.4	15.0	10.8	0.4	1.2	23.8	59.5	4.4	68.8
S.D	1.53	0.61	9.44	6.43	0.63	1.94	8.84	8.22	2.54	15.58

Table 10: Peripheral blood picture in group III (after induction of remission).

Case No.	Hb g%	RBC's $\times 10^6/\text{cm}$	WBC's $\times 10^3/\text{cm}$	Blast cells %	Segmented %			L %	M %	Platalets $\times 10^3/\text{cmm}$
					B	E	N			
1	10.00	3.9	5.4	0	0	1	55	44	0	150
2	9.50	3.7	10.8	0	0	3	58	38	1	200
3	12.50	4.2	5.6	0	0	0	57	40	3	180
4	9.25	3.3	6.7	0	0	2	59	37	2	200
5	8.50	3.9	11.0	0	0	0	57	38	5	250
6	10.00	3.8	12.5	0	0	5	49	46	0	200
7	10.50	3.9	8.8	0	0	3	57	38	2	300
8	10.90	4.0	4.8	0	0	2	58	36	4	250
9	10.00	3.9	10.0	0	0	2	50	44	4	190
10	9.50	3.5	5.5	0	0	0	55	40	5	160
11	11.00	3.9	6.8	0	0	0	60	37	3	180
12	10.50	3.9	11.0	0	0	2	55	42	1	280
13	14.00	4.5	8.0	0	0	0	57	40	3	285
14	10.00	3.6	13.0	0	0	4	56	40	0	270
15	10.50	3.9	9.5	0	0	0	60	38	2	285
16	11.50	4.1	6.2	0	0	3	57	38	0	300
17	13.50	4.3	11.5	0	0	1	54	42	3	250
18	11.50	4.0	8.0	0	0	0	60	40	0	220
Range	8.5-14	3.3-4.5	4.8 - 13	0	0	0-5	49-60	37-46	0-5	150-300
X	10.7	3.9	8.6	0	0	1.4	56.4	39.9	2.1	230.5
S.D	1.44	0.27	2.65			1.61	3.12	2.76	1.74	49.61

Table (1D): Continued

No.	TCNCX10 ³	Clant cells		Reticulated cells		Blast cells		Prolymphocytes		Myelocytes			Segmented			Staff cells		Lymphocytes		Monocytes		Proerythro- blasts		Normoblasts			Plasma cells		Cells in mitosis	
		B	E	N	Juviniles	Staff cells	B	E	N	B	E	N	B	E	N	B	E	N	B	E	N	B	E	N	B	E	N	B	E	N
17	350	36	1	32	2	0	1	3	1	2	0	1	23	28	1	0	0	1	1	1	1	0	0	1	1	1	1	1	2	
18	270	21	1	48	2	0	1	3	2	0	0	2	12	24	1	0	0	2	1	1	1	0	0	1	1	1	1	1	1	
19	830	27	1	25	1	0	1	3	2	3	0	1	24	33	0	3	1	2	2	0	0	3	1	2	2	0	0	1	1	
20	330	25	0	60	2	0	0	3	2	2	1	0	6	15	1	2	1	0	1	2	2	1	0	1	2	2	0	2	2	
21	330	45	1	25	2	0	1	2	2	2	0	2	22	25	3	2	2	2	2	3	2	2	2	2	2	3	2	2	2	
22	230	30	1	46	3	0	0	3	1	1	0	0	13	27	1	0	1	0	1	1	1	0	1	0	1	1	1	1	1	
23	560	22	0	72	0	0	0	1	0	0	0	0	8	13	0	1	1	1	2	0	0	1	1	1	2	0	0	1	1	
24	480	23	1	32	2	0	1	3	1	2	0	1	13	30	2	2	2	2	2	2	2	2	2	1	3	2	2	2	2	
25	290	18	0	50	3	0	1	3	2	1	0	0	10	17	0	3	1	0	0	0	0	3	1	0	0	0	0	1	1	
Range	180-630	18-60	0-2	25-72	0-3	0-1	0-3	1-3	0-4	0-3	0-3	0-2	6-24	15-36	0-3	0-4	0-2	0-3	0-4	0-3	0-3	0-4	0-2	0-3	0-4	0-3	0-3	1-2	1-2	
$\bar{X}$	378.8	28.9	0.8	40.2	1.8	0.04	0.7	2.6	1.4	1.3	0.2	0.8	14.7	25.7	1.0	1.2	1.2	0.9	2.0	0.9	0.9	1.2	1.2	0.9	2.0	0.9	0.9	1.3	1.3	
S.D.	160.08	9.29	0.52	13.34	0.83	0.20	0.45	0.57	0.76	0.98	0.64	0.72	6.16	5.47	0.78	1.02	0.76	0.83	0.93	0.88	0.88	1.02	0.76	0.83	0.93	0.88	0.55	0.55	0.55	

Table (12): Myelogram in group III (cases after induction of remission).

No. TCNCX103		Giant cells			Reticulated cells			Blast cells			Prolymphocytes			Myelocytes			Juviniles			Staff cells			Segmented			Lymphocytes			Monocytes			Proerythro- blasts			Normoblasts			Plasma cells			Cells in mitosis																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

Table (12) Continued.

No.	TCNCX103	Giant cells		Reticulated cells		Blast cells		Polymorphocytes			Myelocytes			Juveniles		Stain cells		Segmented			Monocytes		Proerythroblasts		Normoblasts			Plasma cells		Cells in mitosis	
								B	E	N	B	E	N	B	E	N	B	E	N	B	E	N	A	I	L						
16	75	2	3			1	3	1	2	18	2	3	1	1	14	20	2	0	1	5	18	1	2								
17	60	1	3			1	4	2	2	20	2	4	2	1	14	23	1	2	0	4	12	1	1								
18	80	1	2			0	5	1	2	22	1	2	0	3	18	17	1	2	2	5	13	2	1								
Range	40-90	0-3	0-3			0-3	1-5	0-2	1-4	9-22	1-3	2-5	0-2	1-6	14-26	15-24	0-3	0-3	0-3	3-6	9-19	1-2	1-2								
$\bar{X}$	58.4	1.4	1.5			1.2	2.9	0.7	2.1	15.3	2.0	3.2	0.9	2.9	18.0	17.7	1.6	1.4	1.4	1.7	15.3	1.4	1.6								
S.D.	19.62	0.91	1.24			0.98	1.34	0.75	0.80	3.93	0.84	1.11	0.80	1.49	5.54	4.33	0.91	0.91	0.97	1.08	2.93	0.50	0.51								

III. Biochemical findings:

Table(13) shows that the mean values for serum calcium, phosphate, uric acid, urea, and creatinine of the control group were 9.6 ± 0.64 mg/dl, 4.8 ± 0.31 mg/dl, 4.1 ± 1.14 mg/dl, 20.7 ± 4.66 mg/dl and 0.7 ± 0.15 mg/dl, respectively.

Table (14) shows that cases of pretreatment group (group I) had a mean value of serum calcium, phosphate, uric acid, urea and creatinine of 9.8 ± 0.77 mg/dl, 4.2 ± 0.60 mg/dl, 6.3 ± 1.36 mg/dl, 35.9 ± 11.05 and 0.8 ± 0.22 mg/dl respectively. The mean values for serum calcium, phosphate, uric acid, urea, and creatinine in the 72 hours post-treatment group (group II) were 7.7 ± 0.86 mg/dl, 7.2 ± 1.46 mg/dl, 8.2 ± 1.13 mg/dl, 52.2 ± 19.27 mg/dl, and 0.9 ± 0.18 mg/dl respectively. After induction of remission, the mean serum values for the same biochemicals were 9.3 ± 0.69 mg.dl, 4.8 ± 0.52 mg/dl, 5.0 ± 0.78 mg/dl, 31.6 ± 6.80 mg/dl, and 0.8 ± 0.18 mg/dl respectively.

Figs(3 and 4) show histograms of serum calcium, phosphate, uric acid, urea, and creatinine levels in the control, pretreatment, 72 hours post-treatment, and remission groups.

Table (13) Serum calcium, phosphate, uric acid, urea and creatinine in the control group.

No.	Serum calcium	Serum phosphate	Serum uric acid	Serum urea	Serum creatinine
1	9.2	4.9	3.0	14	0.7
2	10.2	4.8	4.0	15	0.9
3	9.0	5.2	6.5	18	0.5
4	9.2	4.2	2.8	31	0.6
5	10.0	5.0	5.0	22	0.8
6	9.5	4.5	3.5	23	0.7
7	9.7	4.9	5.0	29	0.7
8	11.0	5.3	4.0	24	0.8
9	9.8	4.7	2.7	18	0.6
10	10.2	5.0	5.0	22	0.9
11	9.0	4.9	3.2	24	0.8
12	8.8	4.5	4.0	18	0.4
$\bar{X}$	9.6	4.8	4.1	20.7	0.7
S.D	0.64	0.31	1.14	4.66	0.15

Table (14): Serum calcium, phosphate, uric acid, urea and creatinine in groups I, II and III.

No	Serum calcium			Serum phosphate			Serum uric acid			Serum urea			Serum creatinine		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
1	9.8	7.4	9.5	5.2	7.1	4.8	5.5	6.8	5.6	26	30	25	0.8	0.7	0.7
2	9.0	7.2	8.6	3.2	7.1	4.0	6.3	7.9	4.7	30	32	29	0.9	0.7	0.8
3	9.5	7.3	9.8	3.8	7.4	5.4	5.0	7.0	5.0	27	35	30	1.0	0.5	0.9
4	9.5	7.2	8.9	5.3	8.6	4.2	3.8	6.2	5.2	17	22	23	0.7	0.6	1.0
5	9.6	7.5	8.7	4.2	6.7	4.9	6.2	8.5	4.0	29	34	28	0.5	0.6	0.7
6	11.0	8.1	9.3	3.5	6.4	4.8	8.5	9.4	5.5	56	79	44	1.0	1.0	1.1
7	9.5	7.6	9.5	4.2	7.0	4.5	6.0	7.2	3.6	25	36	23	0.7	0.9	0.6
8	10.2	6.6	7.2	4.5	9.0	4.7	8.7	9.5	4.8	36	71	30	0.6	1.1	0.9
9	10.5	7.2	9.2	4.8	9.0	4.3	8.0	10.0	5.0	35	60	42	1.1	1.3	1.0
10	11.0	10.2	9.0	3.9	6.8	5.2	7.2	8.4	4.5	25	46	28	0.5	0.9	0.8
11	11.0	8.0	9.8	3.2	6.2	4.5	7.0	9.2	5.2	35	61	32	0.6	1.0	0.6
12	8.9	6.8	10.2	5.1	9.4	5.0	7.7	10.0	5.3	32	57	33	0.8	0.8	0.8
13	10.2	8.0	9.6	4.5	7.1	5.2	6.5	8.6	3.8	57	77	40	0.7	1.4	0.9
14	9.5	7.4	10.5	4.3	8.0	5.1	5.4	7.6	5.5	36	65	35	1.0	1.2	1.0
15	8.3	7.0	11.0	3.6	6.8	4.9	7.0	9.4	5.5	34	78	34	1.0	0.9	0.7
16	10.0	7.1	7.3	4.8	9.4	4.8	7.5	8.5	6.5	42	84	42	0.8	1.1	0.6
17	9.1	8.7	9.0	4.0	7.2	5.3	6.5	8.7	3.5	52	46	29	0.6	0.8	1.1
18	9.8	7.9	9.5	3.9	7.0	4.4	4.0	8.6	5.8	40	45	22	0.3	0.7	0.5
19	9.5	6.9		4.5	8.1		4.8	7.0		27	42		1.0	1.1	
20	10.3	8.8		4.6	5.8		8.0	8.5		28	30		0.7	0.6	
21	11.0	9.0		5.0	6.7		5.7	7.5		30	34		1.1	1.2	
22	9.4	7.2		3.6	5.6		5.5	8.5		56	74		1.0	0.7	
23	10.6	8.7		4.2	5.5		5.5	9.0		52	80		0.8	1.1	
24	9.2	6.8		4.2	6.0		6.0	6.0		40	48		0.6	0.9	
25	8.6	7.0		3.8	5.6		4.5	7.0		30	38		0.5	0.8	
X	9.8	7.7	9.3	4.23	7.2	4.8	6.3	8.2	5.6	35.9	52.2	31.6	0.8	0.9	0.8
S.D	0.77	0.86	0.69	0.60	1.46	0.52	1.36	1.13	0.78	11.05	19.27	6.80	0.22	0.18	0.18

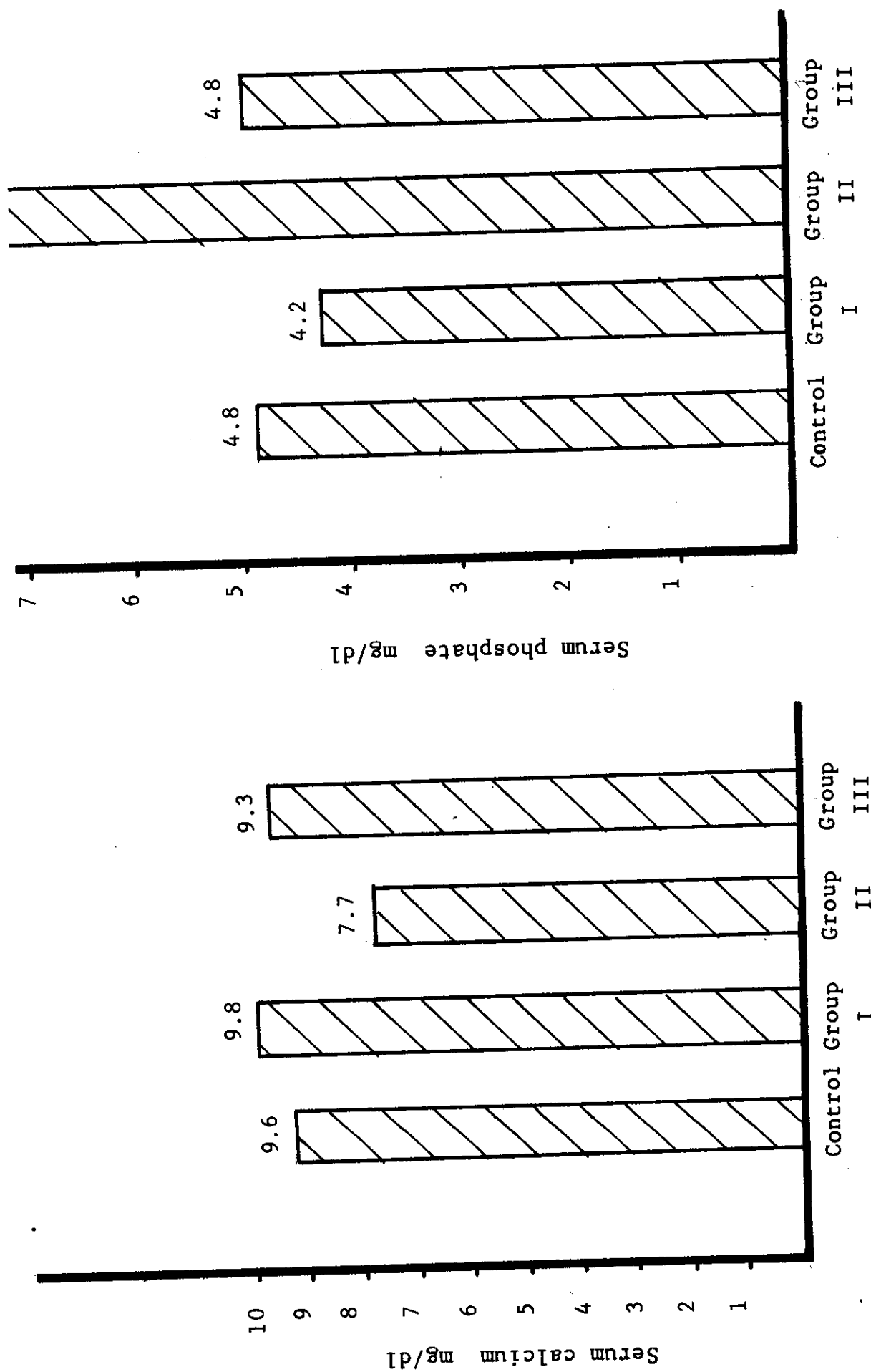


Fig.(3) : Histogram of serum calcium and phosphate levels in the control, pretreatment, 72 hours post treatment and remission groups.

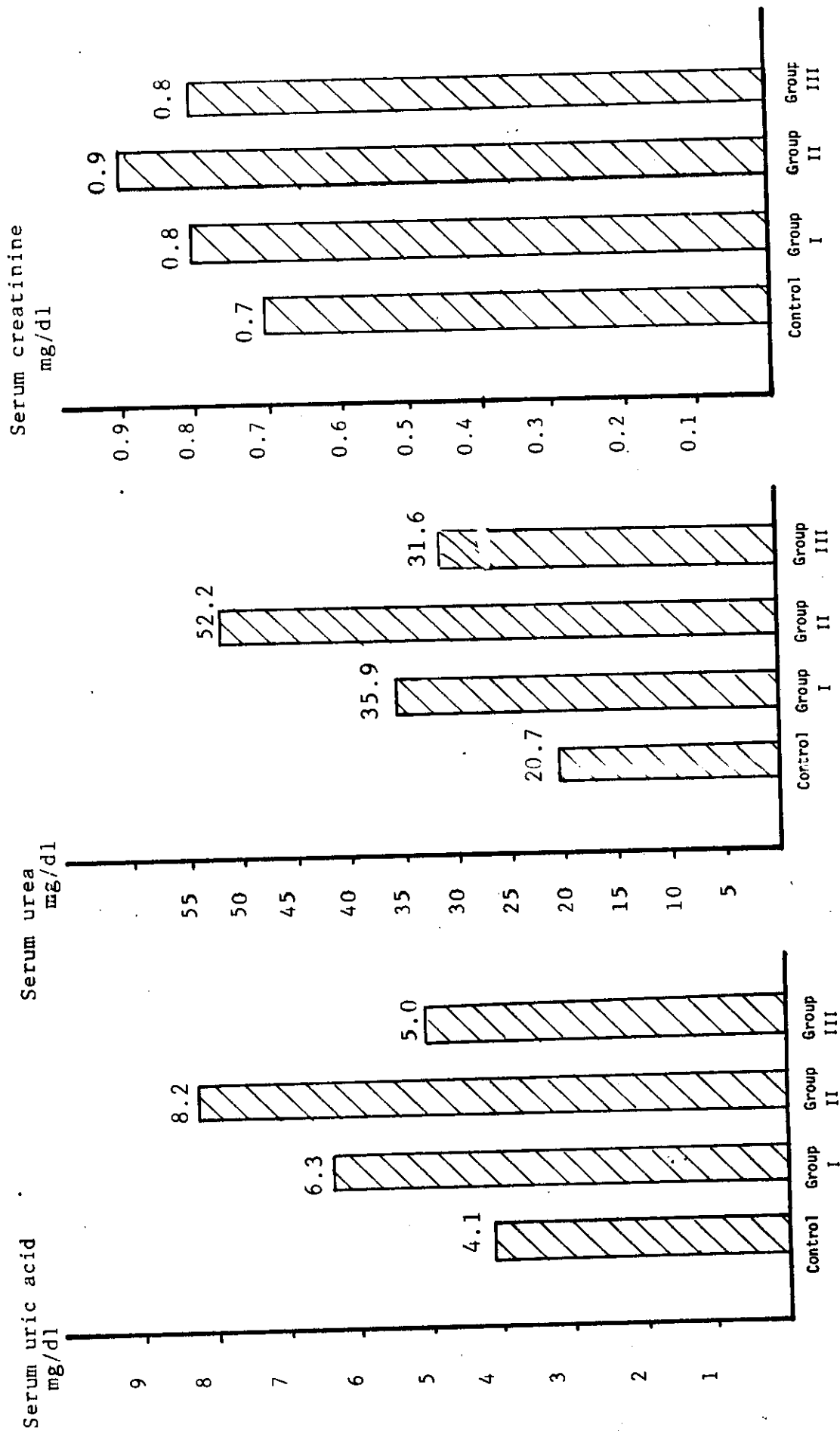


Fig.(4): Histogram of serum uric acid, urea, and creatinine levels in the control pretreatment, 72 hours after treatment and remission groups.

1. Serum calcium

The mean value of serum calcium in cases on admission (group I) and cases after induction of remission (group III) showed no significant difference when matched with control group and with each other.

Serum calcium level in cases 72 hours post treatment (group II) showed significant lowering when matched with cases on admission (group I) and control group. Tables (15) and (16).

Table (15): Serum calcium in the control, pretreatment, 72 hours post treatment and remission group

	Control	Group I	Group II	Group III	F-test
$\bar{X}$	9.6	9.8	7.7	9.3	32.54*
S.D.	0.64	0.77	0.86	0.69	

* Significant.

Table (16) : Serum calcium and phosphate in the pre-treatment cases (group I) and 72 hours post treatment cases (group II).

		Group I	Group II	T-test
Calcium	$\bar{X}$	9.8	7.7	9.30*
	S.D.	0.77	0.86	
Phosphate	$\bar{X}$	4.2	7.2	8.79 *
	S.D.	0.60	1.46	

* Significant

2. Serum phosphate

the mean value of serum phosphate was numerically lower in cases, on admission (group I) when matched with the controls, with no statistically significant difference.

Cases 72 hours post-treatment (group II) showed a significant elevation in mean serum phosphate level when matched with cases on admission (group I) and the control group.

The cases after induction of remission (group III) showed no significant difference when matched with cases on admission (group I) and control Tables (16 and 17).

Table (17) : Serum phosphate in the control, pretreatment, 72 hours of treatment and remission groups.

	Control	Group I	Group II	Group III	F-test
$\bar{X}$	4.8	4.2	7.2	4.8	41.81*
S.D.	0.31	0.60	1.46	0.52	

* Significant.

3. Serum uric acid:

Tables (18 and 19) show that uric acid mean value in serum was significantly higher in cases on admission (group I) when matched with that of control value. Further significant rise of the uric acid in serum in cases 72 hours post-treatment (group II) was obtained when it was matched with both cases on admission (group I) and controls. Cases after induction of remission (group III) showed no significant difference when matched with cases on admission (group I) and control group.

Table (18) : Serum uric acid in the control, pretreatment, 72 hours post treatment and remission groups.

	Control	Group I	Group II	Group III	F-test
$\bar{X}$	4.1	6.3	8.2	5.0	46.18 *
S.D.	1.14	1.36	1.13	0.78	

* Significant.

Table (19): Serum uric acid, urea and creatinine in pretreatment cases (group I) and 72 hours post treatment cases (group II).

		Group I	Group II	T-test
Uric Acid	$\bar{X}$	6.3	8.2	5.48*
	S.D.	1.36	1.13	
Urea	$\bar{X}$	35.9	52.2	3.66*
	S.D.	11.05	19.27	
Creatinine	$\bar{X}$	0.8	0.9	1.75 ⁿ
	S.D.	0.22	0.18	

* Significant.

n non significant

4. Serum urea

The mean serum urea level showed a significant statistical rise in cases on admission (group I) and cases 72 hours post treatment (group II) when matched with control group and with each other.

Cases after induction of remission (group III) showed no statistically significant difference when matched with cases on admission (group I) and the controls (Tables 19 and 20).

Table (20) : Serum urea in the control, pretreatment, 72 hours post treatment, and remission groups.

	Control	Group I	Group II	Group III	F-test
$\bar{X}$	20.7	35.9	52.2	31.6	16.98*
S.D.	4.66	11.05	19.27	6.80	

* Significant.

5. Serum creatinine:

Table(19 and 21)show that there is no statistically significant difference between the controls, cases on admission (group I), cases 72 hours post-treatment (group II) and cases after induction of remission (group III), when matched with each other.

Table (21) : Serum creatinine in the control, pretreatment, 72 hours after treatment and remission groups.

	Control	Group I	Group II	Group III	F-test
$\bar{x}$	0.7	0.8	0.9	0.8	2.73 ⁿ
S.D.	0.15	0.22	0.18	0.18	

n: non significant

Correlations:

Table (22) show that no correlations were found between the changes in the serum calcium and phosphate levels from pretreatment cases (Group I) to 72 hours post-treatment cases (group II), and the change in the total leucocytic counts from group I to group II or the percentage of blast cells in the myelogram at time of diagnosis.

Table (22) Correlation between changes in serum calcium and phosphate changes in leucocytic count and blasts in bone marrow.

No.	Changes in serum level 72h post treatment		Difference in total leucocytic count $\times 10^3$	% of blasts in the myelogram at diagnosis
	Calcium	Phosphate		
1	2.4	1.9	6	25
2	1.8	3.9	26	30
3	2.2	3.6	1	40
4	2.3	3.3	85	30
5	2.1	2.5	11	32
6	2.9	2.9	60	60
7	1.9	2.8	8	35
8	3.6	4.5	8	30
9	2.3	4.2	27	50
10	0.8	2.9	6	28
11	3.0	3.0	27	35
12	2.1	4.3	73	55
13	2.2	2.6	12.5	30
14	2.1	3.7	2	40
15	1.3	3.2	3.5	50
16	2.9	4.6	8	58
17	0.4	3.2	36	32
18	1.9	3.2	52	48
19	2.6	3.6	1	22
20	1.5	0.7	47	60
21	2.0	1.7	14	25
22	2.2	2.0	5	46
23	1.9	0.9	43	72
24	2.4	0.2	20	32
25	1.6	0.4	16.5	50
$r_1 = 0.027$ $r_2 = 0.005$ $r_1 = 0.005$ $r_2 = 0.228$				

r_1 = Coefficient of correlation between the difference in electrolyte 72 hours post-treatment with the difference in total leucocytic count in blood picture

r_2 = Coefficient of correlation between the difference in electrolyte 72h post-treatment with the % of blasts in myelogram.