

Results

Table (13): Socio-demographic data

		No.	%
sex	male	22	44.0
	female	28	56.0
	Total	50	100.0
Residence	Urban	27	54.0
	Rural	23	46.0
	Total	50	100.0
Care-giver	Parents	31	62.0
	Father	4	8.0
	Mother	10	20.0
	Grandma	5	10.0
	Total	50	100.0
Education of Care-giver	High educated	13	26.0
	Moderate educ.	20	40.0
	Low educ.	17	34.0
	Total	50	100.0
Occupation of Care-giver	Semi-skilled	16	32.0
	Skilled	34	68.0
	Total	50	100.0
Age	(Mean + S.D.)	10.75 +2.685	
	Range	5-15 years	

The table shows that females account for about 56% of the study group and males accounts for 44%. Range of age in our patients is 5-15 years old and most of them have skilled moderately educated caregiver.

Table (14): Classification of ALL patients

		No.	%
FAB type	L1	16	32.0
	L2	34	68.0
	Total	50	100.0
Immunophenotype	Early pre B	27	54.0
	Pre B	15	30.0
	T	8	16.0
	Total	50	100.0

The table shows that in FAB classification there is 68% of the study group belongs to L2 and the rest belong to L1 , While according to immunophenotype about 54% of the study group belongs to early pre-B and the rest belong to pre-B&T types.

Table (15): Distribution of the study group according to the protocol of treatment

		No.	%
Protocol of TTT	CCG	25	50.0
	T13	25	50.0
	Total	50	100.0

The table shows that 50% of the study group was treated by modified CCG protocol with low dose methotrexate and the other 50% of the study group was treated by T13 with high dose methotrexate.

Fig. (11): Classification of ALL patients by morphology (FAB) classification

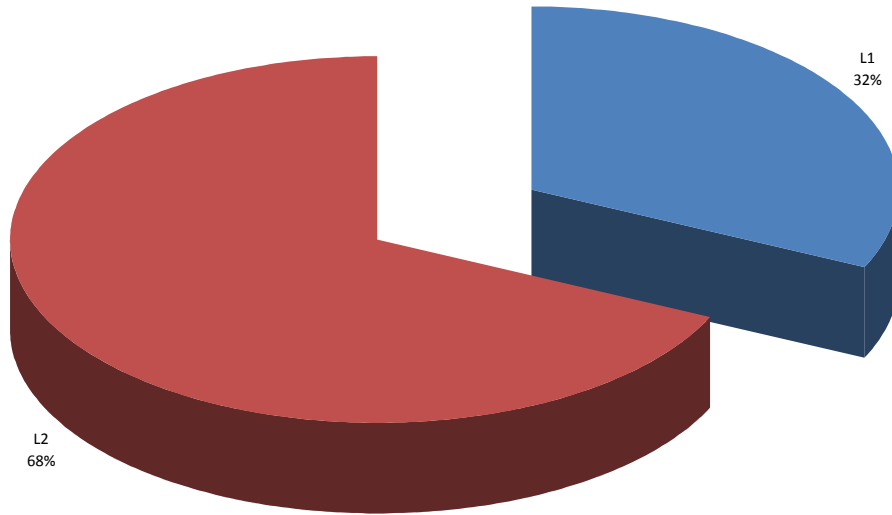


Fig. (12): Classification of ALL patients by Immunophenotype

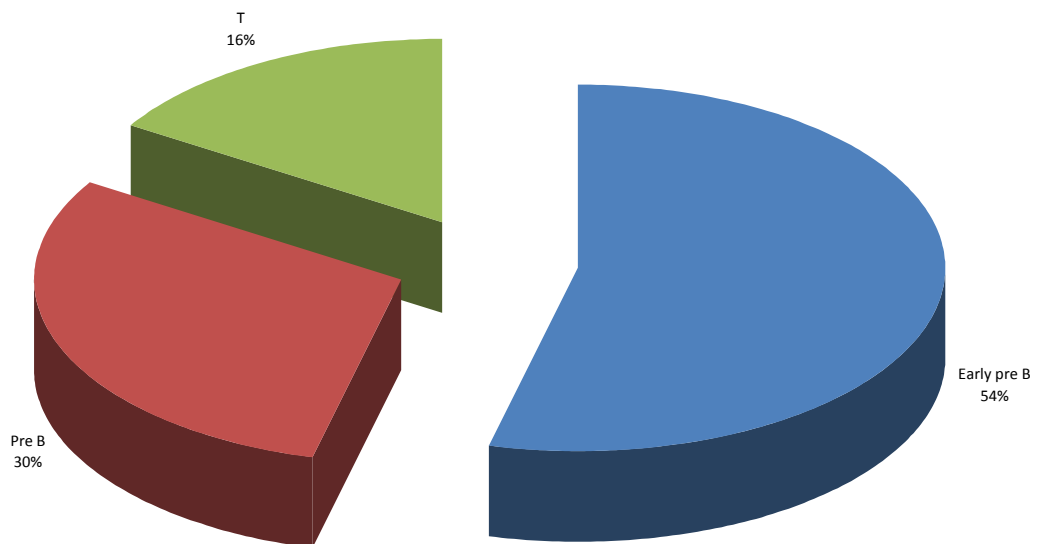


Table (16): Wechsler total IQ parameters between leukemic group and control group.

	Group I N = 50 Mean ± S.D.	Group II N = 20 Mean ± S.D.	t	p
Total IQ	91.20±13.148	111.70±18.451	4.2	< 0.001
Total Verbal IQ score	85.60±15.973	103.50±18.241	3.2	< 0.01
Total performance IQ score	97.28±16.205	115.70±12.720	3.3	< 0.01

The table shows that there is highly significant decrease of full scale scores in leukemic group than control group.

P < 0.01: high significant (HS)

P < 0.05: significant (S)

Group (I): Leukemic group

Group (II): Control group

Fig (13): Total I.Q. for leukemic group and control group

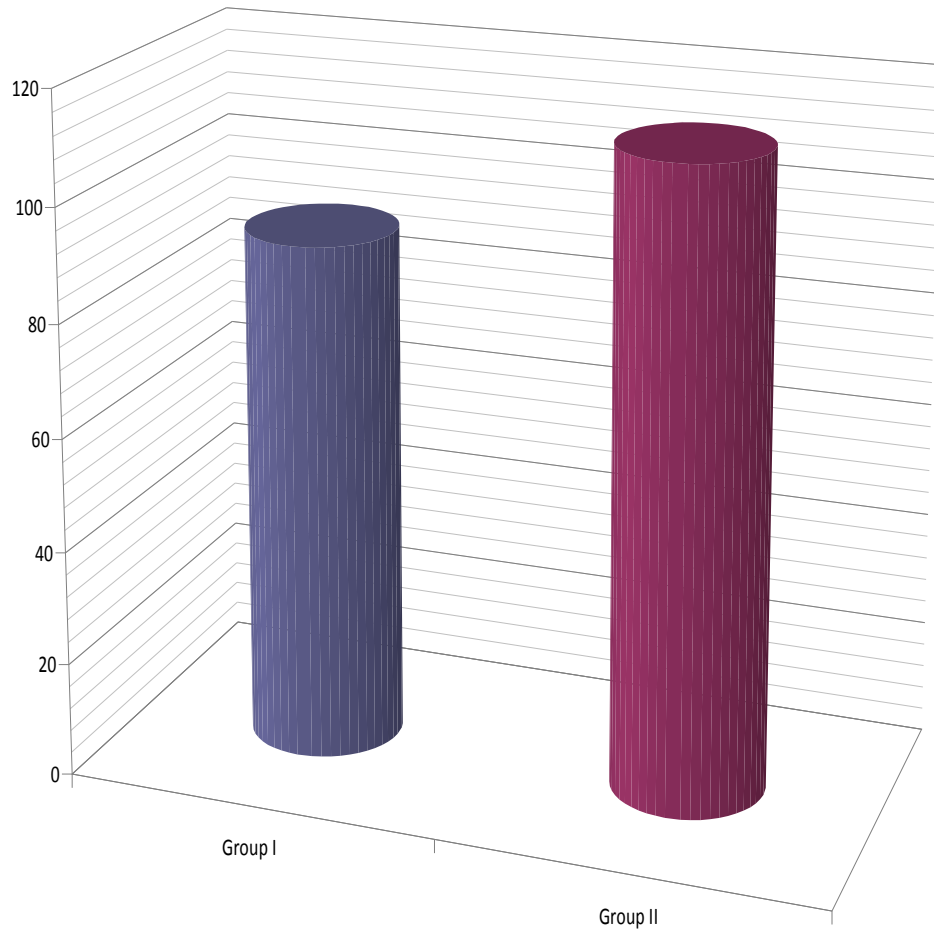


Table (17): Wechsler verbal IQ for leukemic group and control group

	Group I N = 50 Mean ± S.D.	Group II N = 20 Mean ± S.D.	t	p
Verbal IQ	85.60±15.973	103.50±18.241	3.2	< 0.01
Information	7.84 ± 2.713	10.40 ± 3.534	2.6	< 0.05
Comprehension	5.0 ± 2.850	9.50 ± 4.882	3.3	< 0.05
Arithmetic	4.40 ± 2.507	8.60 ± 1.647	3.9	< 0.05
Similarities	5.90 ± 3.046	8.70 ± 3.561	2.7	< 0.05
Vocabulary	4.04± 3.181	12.20 ± 5.073	4.9	< 0.001
Digit span	5.42 ± 2.241	9.40 ± 2.547	3.2	< 0.05

The table shows that ALL survivors' cognitive functions are significantly below the test normative data for verbal IQ.

Fig (14): Wechsler verbal I.Q. for leukemic group and control group

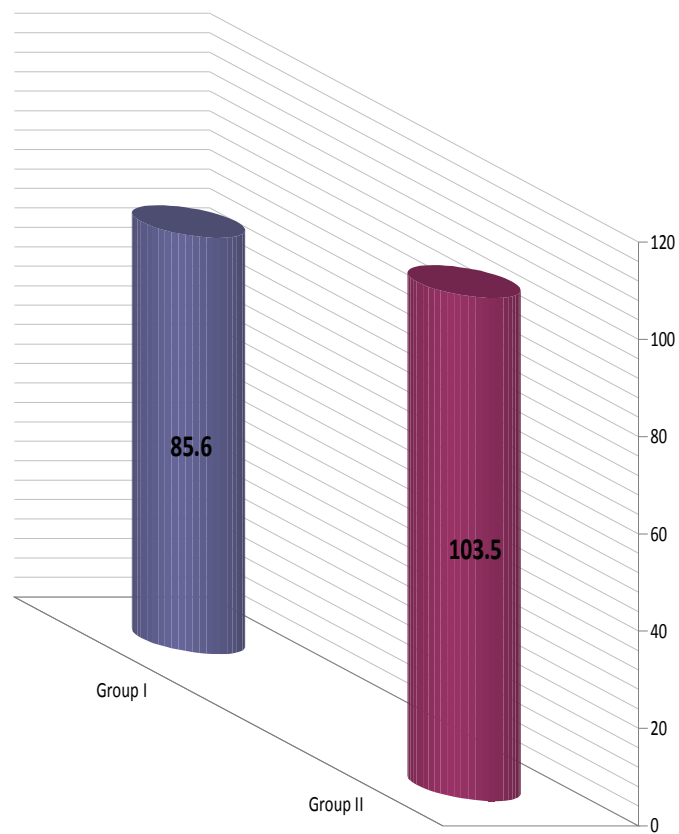


Table (18): Wechsler performance IQ for leukemic group and control group

	Group (I) N = 50 Mean ± S.D.	Group (II) N = 20 Mean ± S.D.	t	p
Total performance IQ score	97.28±16.205	115.70±12.720	3.3	< 0.01
Picture completion	8.34 ± 3.068	11.60±1.897	3.2	< 0.01
Picture arrangement	6.18 ± 2.946	12.30 ± .949	0.2	< 0.01
Block design	5.36 ± 2.933	9.50 ± 2.068	3.2	< 0.05
Object assembly	3.36 ± 2.812	7.90 ± 2.424	3.5	< 0.05
Coding	11.16± 4.451	15.90± 4.254	3.8	< 0.05
Mazes	7.82 ± 2.327	13.30± 4.029	4.2	< 0.01

The table shows that ALL survivors' cognitive functions are significantly below the test normative data for performance IQ.

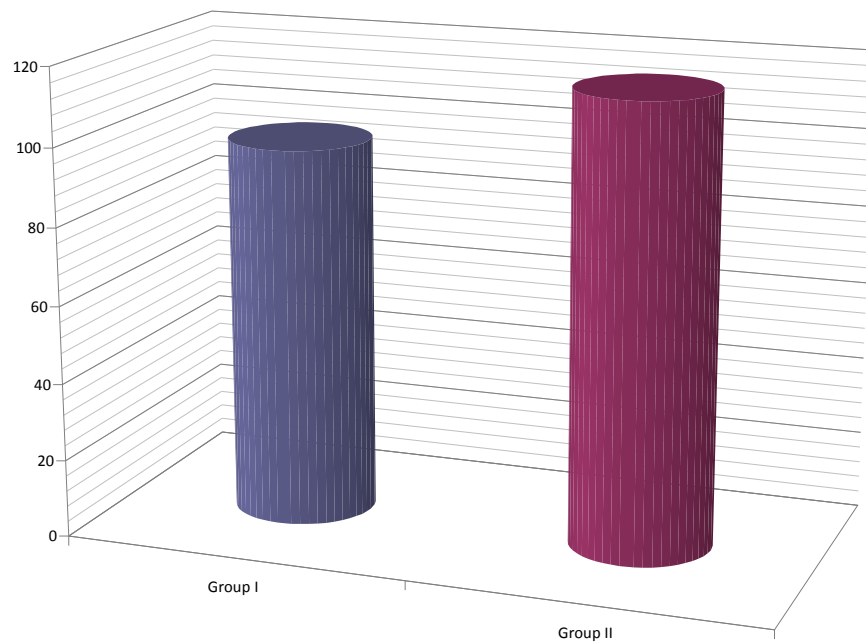
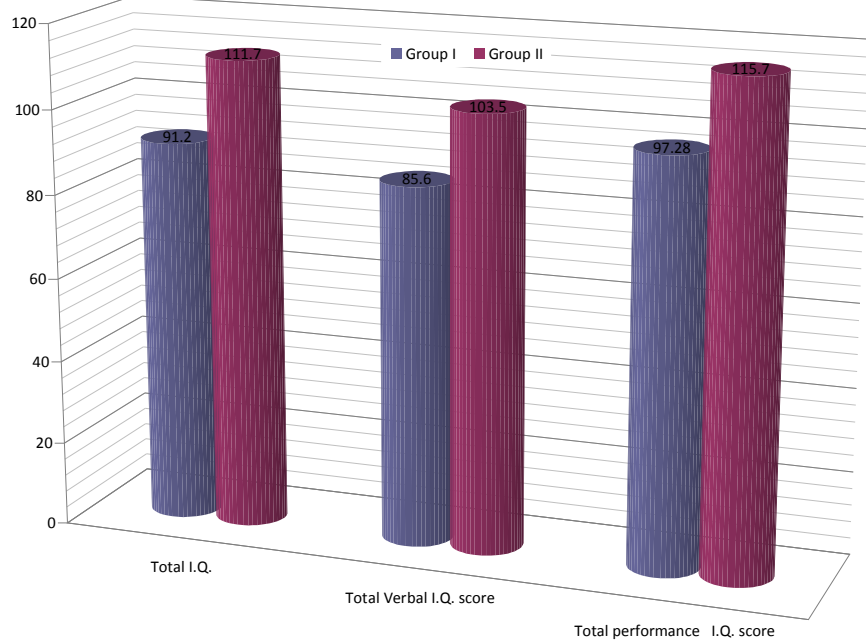
Fig. (15): Total performance I.Q. for leukemic group and control group**Fig (16): Wechsler total IQ parameters between leukemic group and control group**

Table (19): Wechsler total IQ parameters as regards the age at diagnosis of the disease

	≤ 5 years N = 23 Mean ± S.D.	> 5 years N = 27 Mean ± S.D.	t	p
Total IQ	69.48 ± 7.654	92.458± 11.353	3.2	< 0.01
Total Verbal IQ score	86.48 ± 11.859	84.85±18.989	0.4	>0.05
Total performance IQ score	45.96 ±12.488	98.41 ± 18.976	3.5	<0.05

The table shows that there is significant decrease of both global and total performance IQ scores in younger age group of ALL survivors while there is no significant difference in verbal IQ ≤ 5 years or > 5 years.

Table (20): Verbal IQ data according to the age at diagnosis of the disease

	≤5 years N = 23 Mean ± S.D.	> 5 years N = 27 Mean ± S.D.	t	p
Total verbal IQ scores	86.48± 11.859	84.85± 18.989	0.4	>0.05
Information	8.39 ± 3.201	7.37± 2.169	1.3	>0.05
Comprehension	5.0 ± 1.679	5.0 ± 3.595	0	>0.05
Arithmetic	10.13 ± 2.702	8.78 ± 2.190	1.9	>0.05
Similarities	7.00 ± 2.939	6.81 ± 3.187	0.2	>0.05
Vocabulary	3.65 ± 3.024	4.37 ± 3.330	0.8	>0.05
Digit span	7.78 ± 2.255	7.11 ± 2.225	1.1	>0.05

The table shows no significant differences between ALL survivors regarding verbal IQ ≤5 years or >5 years.

Table (21): Performance IQ data according to the age at diagnosis of the disease

	≤ 5 years N = 23 Mean ± S.D.	> 5 years N = 27 Mean ± S.D.	t	p
Total performance IQ score	45.96 ±12.488	98.41± 18.976	3.5	<0.05
Picture completion	8.22 ± 3.503	8.44 ± 2.708	0.3	>0.05
Picture arrangement	2.83 ± 2.125	6.48 ± 3.512	2.8	<0.05
Block design	2.6 ± 4.3	8.5 ± 4.2	4.35	<0.01
Object assembly	5.8 ± 2.4	8.0 ± 2.7	2.12	<0.05
Coding	7.35 ± 4.969	13.0 ± 4.048	3.3	<0.05
Mazes	9.78 ± 2.467	8.95 ± 2.248	0.5	>0.05

The table shows significant differences in total performance IQ scores but picture completion and mazes only have no significant score in early age of onset children.

Fig. (17): Total Verbal I.Q. data according to the age at diagnosis of the disease

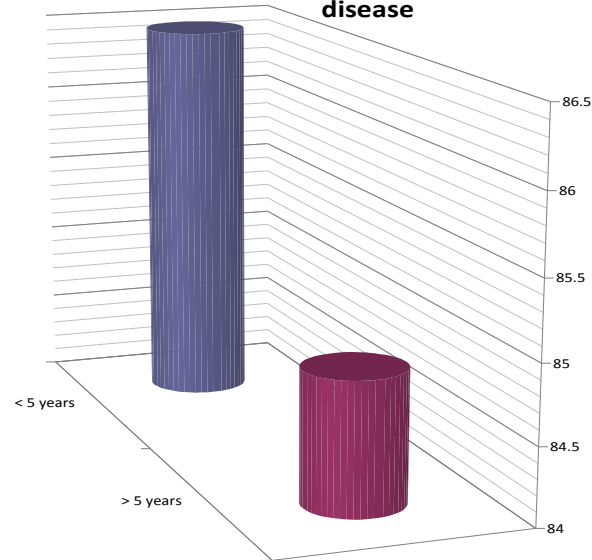


Fig. (18): Total Performance I.Q. data according to age at diagnosis of the disease

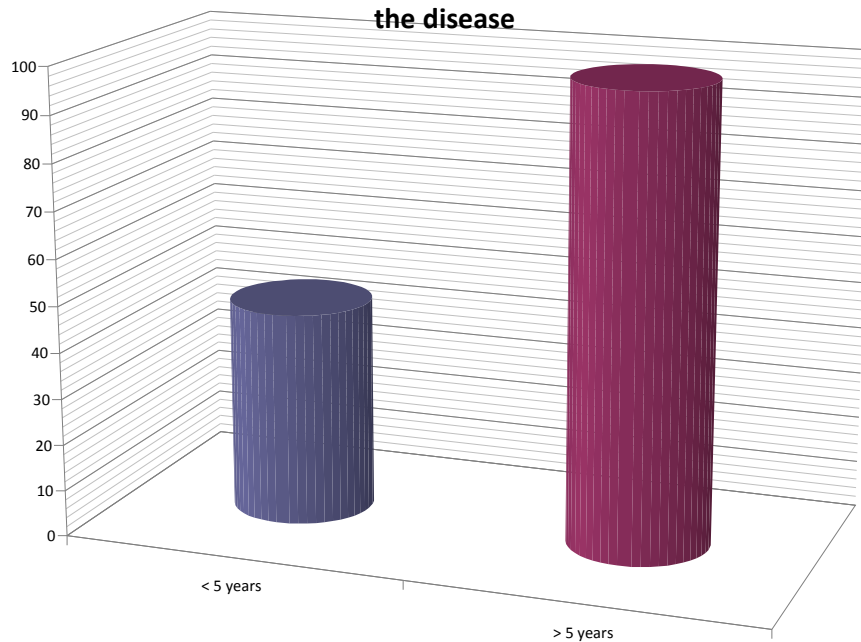


Table (22): Comparison of total IQ parameters as regards sex

	Male N = 22 Mean ± S.D.	Female N = 28 Mean ± S.D.	t	p
Total IQ	97.27±13.936	86.43±10.440	3.1	< 0.05
Total Verbal IQ score	92.18±15.117	80.43± 14.908	2.7	< 0.05
Total performance IQ score	103.41±13.129	92.46±16.906	2.5	< 0.05

The table shows that females do worse than males in full IQ parameters.

Table (23): Comparison of verbal IQ parameters as regards sex

	Male N = 22 Mean ± S.D.	Female N = 28 Mean ± S.D.	t	p
Total Verbal IQ	92.18±15.117	80.43± 14.908	2.7	< 0.05
Information	7.95 ± 2.380	5.75 ± 2.989	2.3	< 0.05
Comprehension	8.59 ± 3.459	4.54 ± 2.219	3.3	< 0.05
Arithmetic	9.45 ± 2.425	7.36 ± 2.614	2.1	< 0.05
Similarities	8.82 ± 3.231	5.18 ± 2.73	2.9	< 0.05
Vocabulary	4.91 ± 3.804	3.36 ± 2.453	1.7	> 0.05
Digit span	8.32 ± 2.124	3.71 ± 2.106	4.2	< 0.01

The table shows that girls do worse than boys in almost all verbal IQ parameters but there is insignificant decrease only in vocabulary.

Table (24): Comparison of performance IQ parameters as regards sex

	Male N = 22 Mean $\pm$ S.D.	Female N = 28 Mean $\pm$ S.D.	t	p
Total performance IQ score	103.41 $\pm$ 13.129	92.46 $\pm$ 16.906	2.5	< 0.05
Picture completion	9.32 $\pm$ 1.912	5.36 $\pm$ 3.773	3.04	< 0.05
Picture arrangement	6.77 $\pm$ 3.366	5.71 $\pm$ 2.537	1.3	> 0.05
Block design	9.14 $\pm$ 2.748	5.75 $\pm$ 2.977	3.7	< 0.05
Object assembly	9.82 $\pm$ 2.954	5.0 $\pm$ 2.694	3.02	< 0.05
Coding	13.82 $\pm$ 4.159	7.64 $\pm$ 4.676	4.3	< 0.01
Mazes	8.59 $\pm$ 1.992	5.21 $\pm$ 2.425	3.2	< 0.05

The table shows that girls do worse in almost all performance IQ parameters while there is insignificant decrease in IQ only in picture arrangement.

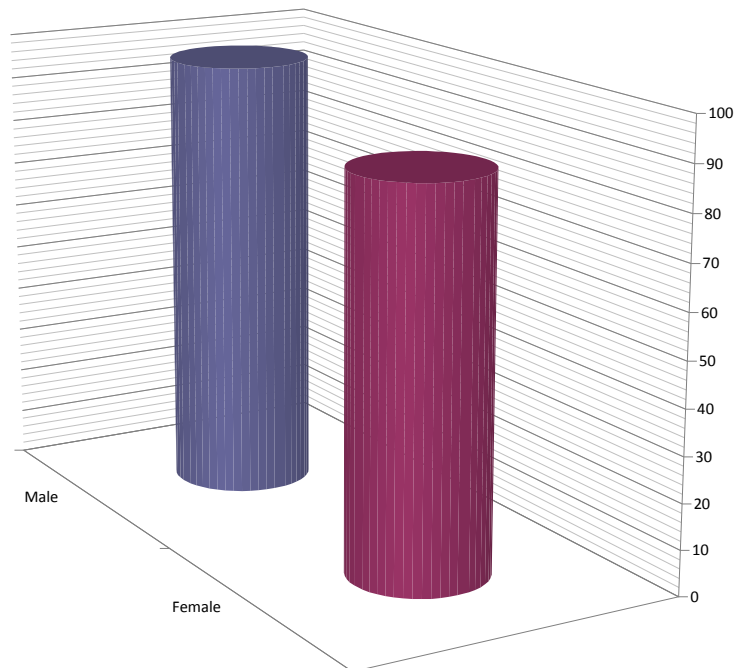
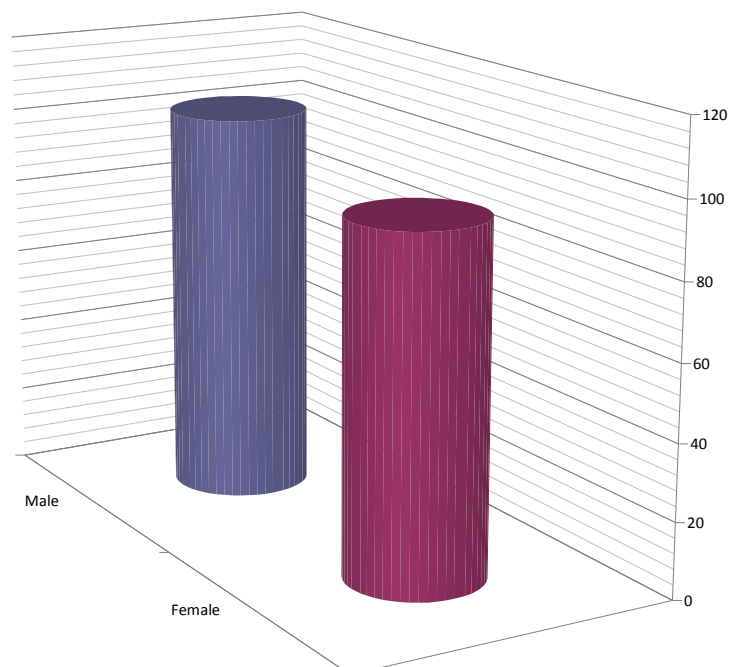
Fig(19): Total verbal I.Q.as regards sex**Fig. (20): Total performance I.Q. as regards sex**

Table (25): Comparison of total IQ parameters as regards protocol of treatment

	CCG N = 25 Mean ± S.D.	T13 N = 25 Mean ± S.D.	t	p
Total IQ	99.52 ± 12.118	82.88 ± 7.865	5.8	< 0.001
Total Verbal IQ score	94.16 ± 13.484	77.04± 13.655	4.5	< 0.001
Total performance IQ score	105.80± 10.985	88.76± 16.256	4.3	< 0.01

The table shows a high significant decrease in total IQ scores in patients who received therapy with high dose methotrexate protocol (T13) than patients who received low dose methotrexate protocol (modified CCG).

Table (26): Comparison of verbal IQ parameters as regards protocol of treatment

	CCG N = 25 Mean ± S.D.	T13 N = 25 Mean ± S.D.	t	p
Verbal IQ	94.16± 13.484	77.04± 13.655	4.5	< 0.001
Information	8.88 ± 2.297	6.80 ± 2.739	2.9	< 0.01
Comprehension	6.36 ± 3.264	3.64 ± 1.440	3.8	< 0.01
Arithmetic	10.32 ± 2.673	8.48 ± 1.982	2.8	< 0.05
Similarities	7.84 ± 3.158	5.96 ± 2.669	2.3	< 0.05
Vocabulary	5.12 ± 3.420	2.96 ± 2.557	2.5	< 0.05
Digit span	8.36 ± 2.018	6.48 ± 2.084	3.2	< 0.05

The table shows a high significant decrease in total verbal IQ scores in patients who received therapy with high dose methotrexate protocol (T13) than patients who received low dose methotrexate protocol (modified CCG).

Table (27): Comparison of performance IQ parameters as regards protocol of treatment

	CCG N=25 Mean ± S.D.	T13 N=25 Mean ± S.D.	t	p
Total performance IQ score	105.80±10.985	88.76± 16.256	4.3	< 0.01
Picture completion	8.56 ± 2.663	8.12 ± 3.468	0.5	> 0.05
Picture arrangement	7.52 ± 3.356	4.84 ± 1.650	3.6	< 0.01
Block design	9.52 ± 2.104	7.20 ± 3.215	3.1	< 0.01
Object assembly	6.28 ± 3.103	4.44 ± 2.181	2.4	< 0.05
Coding	13.88 ± 3.822	12.44 ± 4.976	1.1	> 0.05
Mazes	8.56 + 1.417	7.08 + 2.812	2.4	< 0.05

The table shows significant decrease in total performance IQ scores in patients who received therapy with high dose methotrexate protocol (T13) than patients who received low dose methotrexate protocol (modified CCG), except in picture completion and coding parameters.

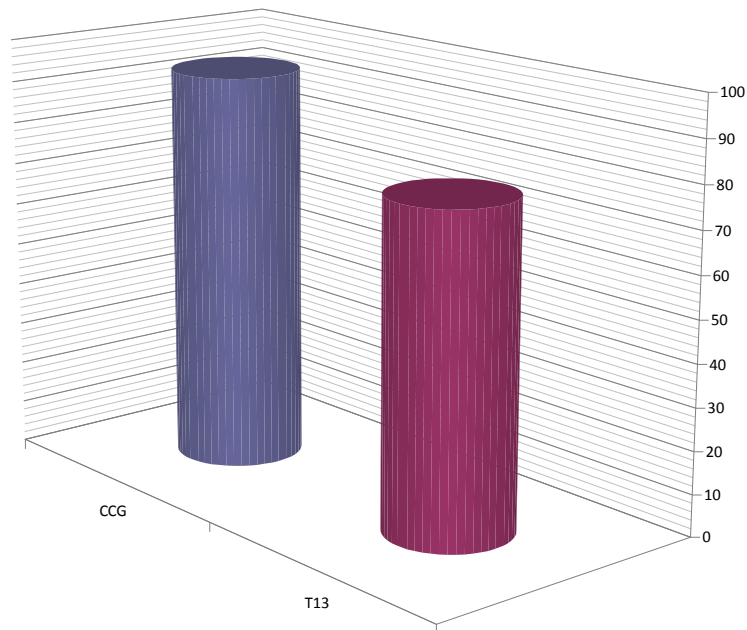
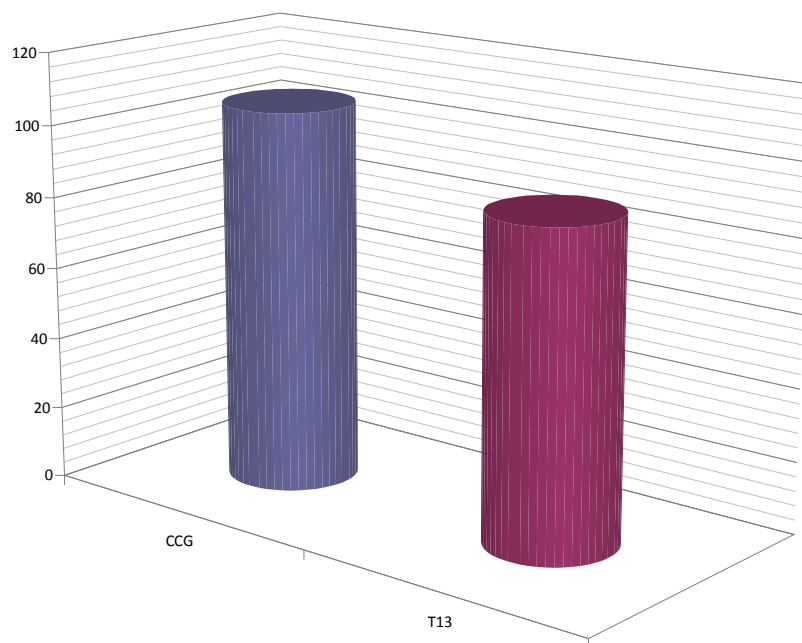
Fig. (21): Total verbal I.Q. as regards protocol of treatment**Fig. (22): Total performance I.Q. as regards protocol of treatment**

Table (28): Correlation between duration from end of therapy & verbal IQ parameters

Duration IQ	r	p
Total		
Verbal IQ	-0.355	< 0.05
Information	-0.179	> 0.05
Comprehension	-0.287	<0.05
Arithmetic	-0.302	< 0.05
Similarities	-0.303	< 0.05
Vocabulary	-0.151	> 0.05
Digit span	-0.196	> 0.05

The table shows negative correlation between the four most global composite scores, total verbal, comprehension, arithmetic and similarities and duration from end of therapy.

Table (29): Correlation between duration from end of therapy & performance IQ parameters

Duration IQ	r	p
Total Performance IQ	-.329	< 0.05
Picture completion	0.022	> 0.05
Picture arrangement	-0.323	< 0.05
Block design	-0.301	< 0.05
Object assembly	-0.348	< 0.05
Coding	0.095	> 0.05
Mazes	-0.088	> 0.05

The table shows negative correlation between the four most global composite scores, total performance, picture arrangement, block design, object assembly and duration from end of therapy.

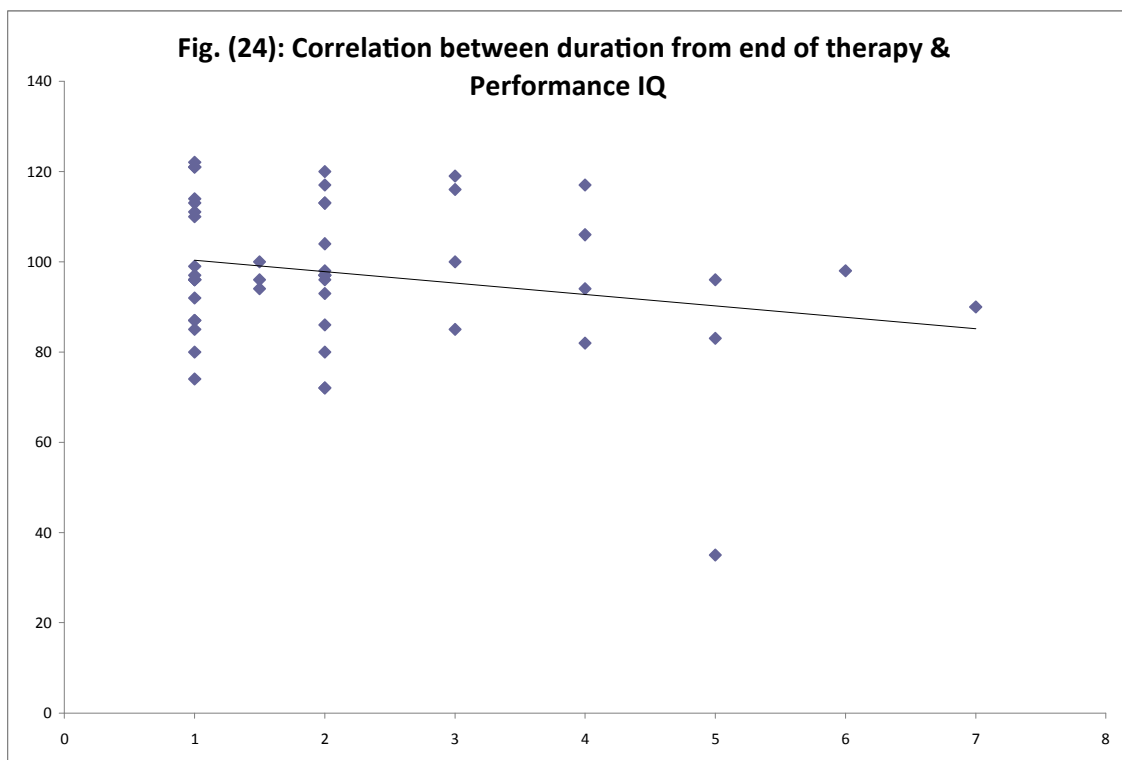
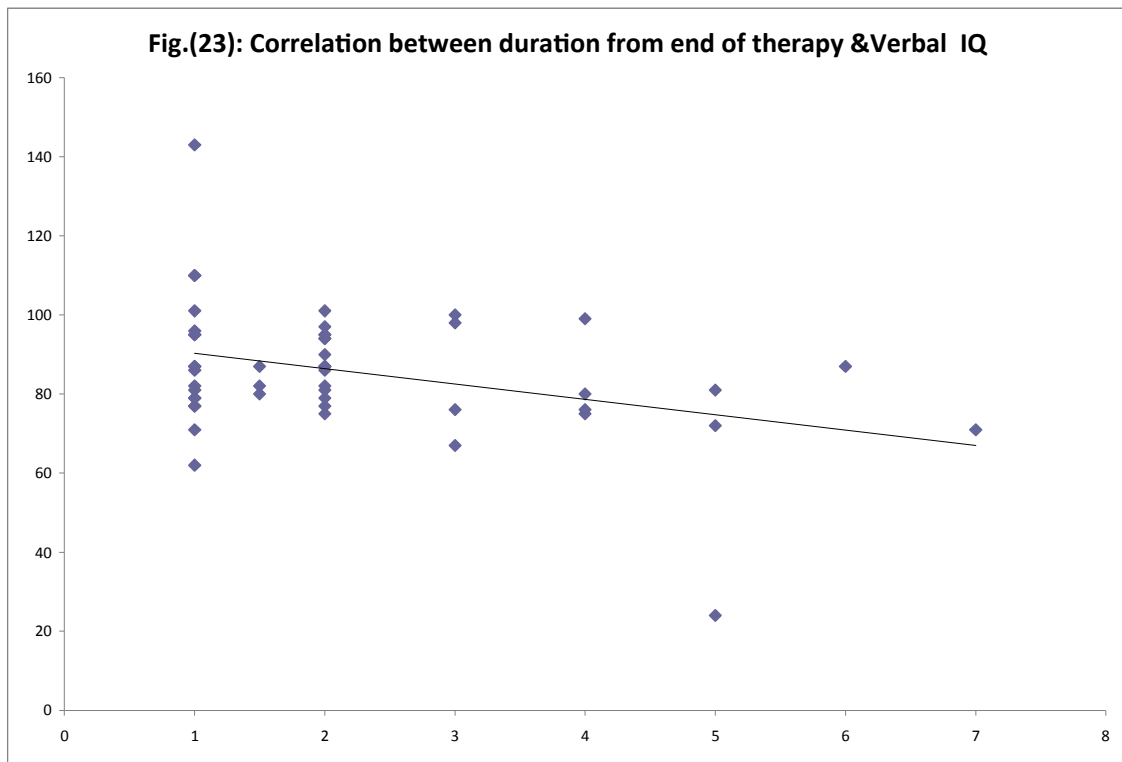


Table (30): Correlation between care-giver education and IQ parameters

Education IQ parameters	r	p
Total IQ	- 0.054	> 0.05
Verbal IQ	- 0.032	> 0.05
Information	- 0.322	< 0.05
Comprehension	- 0.045	> 0.05
Arithmetic	- 0.352	< 0.05
Similarities	- 0.252	> 0.05
Vocabulary	- 0.049	> 0.05
Digit Span	- 0.213	> 0.05
Performance IQ	- 0.064	> 0.05
Picture completion	- 0.225	> 0.05
Picture arrangement	- 0.25	> 0.05
Block design	- 0.26	> 0.05
Object assembly	- 0.036	> 0.05
Coding	- 0.092	> 0.05
Mazes	- 0.042	> 0.05

The table shows insignificant correlation between education of the care-giver and patients' IQ except in information and arithmetic parameters.

Table (31): Correlation between care-giver occupation and IQ parameters

Occupation IQ parameters	r	p
Total I.Q.	0.061	> 0.05
Verbal I.Q.	0.068	> 0.05
Information	0.23	> 0.05
Comprehension	0.22	> 0.05
Arithmetic	0.231	> 0.05
Similarities	0.090	> 0.05
Vocabulary	0.035	> 0.05
Digit Span	0.042	> 0.05
Performance IQ	0.064	> 0.05
Picture completion	0.020	> 0.05
Picture arrangement	0.051	> 0.05
Block design	0.322	< 0.05
Object assembly	0.351	< 0.05
Coding	0.092	> 0.05
Mazes	0.223	> 0.05

The table shows insignificant correlation between occupation of the care-giver and patients' IQ except in block design and object assembly.

