RESULTS AND ANALYSIS OF The RESULTS

This study included 150 children aged from 7–14 years, their mean age was 10.06 ± 2.26 years. Subjects were divided into four groups: -

Group I: - Included 25 patients (10 males and 15 females) with mild mental sub-normality (mean age was 9.7 ± 1.9 years) .

Group II: - Included 25 patients (15 males & 10 females). with moderate mental sub-normality (mean age was 9.7 ± 2.5 years) .

Group III: - Included 25 patients (17 males & 8 females) with Attention Deficit Hyperactivity Disorder (ADHD) (mean age was 10.3 ± 2.1 years).

Group IV:- Included 75 control children (26 males & 49 females mean age was (10.2 ± 2.5 years) .

The results of the present study were summarized in tables (1-17) and Histograms (1-8).

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Group IV:- Included 75 control children (26 males & 49 females mean age was (10.2 ± 2.5 years) .

The results of the present study were summarized in tables (1-17) and Histograms (1-8).

Table (1): Distribution of the studied groups according to residence

Groups	Urban		Rural	
	No.	%	No.	%
Mild MR, group	18	72.0	7	28.0
Moderate MR, group	17	68.0	8	32.0
ADHD group	17	68.0	8	32.0
Control group	37	49.3	38	50.7

Table (2): Distribution of the studied groups according to Socioeconomic status (SES)

Groups	LOW		Moderate		High	
	No.	%	No.	%	No.	%
Mild MR, group	16	64.0	4	16.0	5	20
Moderate MR, group	17	68.0	5	20.0	3	12
ADHD group	10	40.0	11	44.0	4	16
Control group	40	53.3	23	30.7	12	16

N.B This classification based on their residence, parents occupation and family number.

Table (3): Weight, Height and BMI among studied groups

Groups	Weight		Height		BMI	
	Mean	SD	Mean	SD	Mean	SD
Mild MR, group	24.56	5.07	124.4	11.51	15.59	1.09
Moderate MR, group	24.52	4.36	125.7	9.76	15.44	1.07
ADHD group	29.96	6.25	130.8	10.26	17.25	1.55
Control group	33.44	9.98	132.4	14.52	18.52	1.96
F-test	12.32		3.45		33.04	
P-value	0.001**		0.018*		0.001**	

P value (<0.05) Significant *

(<0.001) Highly significant **

Table (4): IQ and Total Aggression among studied groups

Groups	I Q		Total Aggression	
	Mean	SD	Mean	SD
Mild MR, group	66.4	5.9	102.3	12.4
Moderate MR, group	41.5	5.6	-	-
ADHD group	89.3	6.0	101.9	12.37
Control group	100	3.6	74.8	14.35

Table (5) Statistical analysis of Pb in the studied hair samples(μg/g)

Statistical analysis	Mild MR group	Moderate MR group	ADHD group	Control group
Mean (μg/g)	4.16	4.89	5.04	2.45
Median (μg/g)	4.05	4.09	4.98	2.35
SD	1.7	1.09	1.30	0.99
SEM	0.34	0.22	0.26	0.11
t	4.74	9.9	9.04	
P	<0.05 *	<0.01**	<0.01**	

p-value (<0.05) significant * .

p-value (<0.01) highly significant ** .

Table (6) Statistical analysis of Cd in the studied hair samples (μg/g)

Statistical analysis	Mild MR group	Moderate MR group	ADHD group	Control group
Mean (μg/g)	0.46	0.33	0.59	0.41
Median (μg/g)	0.48	0.32	0.58	0.32
SD	0.08	0.11	0.23	0.12
SEM	0.05	0.04	0.04	0.04
t	1.71	2.83	1.55	
P	<0.05 *	<0.05 *	<0.05 *	

p-value (<0.05) significant * .

Table (7) Statistical analysis of Zn level in studied hair samples.

Statistical analysis	Mild MR group	Moderate MR group	ADHD group	Control group
Mean (µg/g)	174.06	181.25	177.38	155.5
Median (µg/g)	170.0	177.9	171.3	160.4
SD	23.99	31.06	21.92	18.50
SEM	4.80	6.21	4.38	2.14
t	3.62	3.99	4.59	
P	<0.01 **	<0.01 **	<0.01 **	

P – value (<0.01) Highly significant.

Table (8) Statistical analysis of Cu level in studied hair samples

Statistical analysis	Mild MR group	Moderate MR group	ADHD group	Control group
Mean (µg/g)	15.30	15.75	14.65	16.09
Median (µg/g)	14.30	12.4	14.8	16.20
SD	5.45	4.92	4.14	5.34
SEM	1.09	0.98	0.83	0.62
t	0.62	0.29	1.39	
P	>0.05	>0.05	>0.05	

P – value (>0.05) not significant.

Table (7) Statistical analysis of Zn level in studied hair samples.

Statistical analysis	Mild MR group	Moderate MR group	ADHD group	Control group
Mean (µg/g)	174.06	181.25	177.38	155.5
Median (µg/g)	170.0	177.9	171.3	160.4
SD	23.99	31.06	21.92	18.50
SEM	4.80	6.21	4.38	2.14
t	3.62	3.99	4.59	
P	<0.01 **	<0.01 **	<0.01 **	

P – value (<0.01) Highly significant.

Table (8) Statistical analysis of Cu level in studied hair samples

Statistical analysis	Mild MR group	Moderate MR group	ADHD group	Control group
Mean (µg/g)	15.30	15.75	14.65	16.09
Median (µg/g)	14.30	12.4	14.8	16.20
SD	5.45	4.92	4.14	5.34
SEM	1.09	0.98	0.83	0.62
t	0.62	0.29	1.39	
P	>0.05	>0.05	>0.05	

P – value (>0.05) not significant.

Table (9): Distribution of the studied groups according to Parent's job.

Groups	Parent's Job			
	Negative		Positive	
	No.	%	No.	%
Mild MR, group	23	92.0	2	8.0
Moderate MR, group	23	92.0	2	8.0
ADHD group	21	84.0	4	16.0
Control group	71	94.7	4	5.3

Exposure to lead as working in batteries factory or as printer or painter (secondary occupational exposure). So, parent's job is classified either positive or negative .

Table (10): Relation of IQ and Total aggression and Parent's job.

Variable	Parent's Job				t-value	p Value
	Negative		Positive			
	Mean	SD	Mean	SD		
IQ	81.46	22.67	81.25	19.89	0.03	0.976
Total-Aggression	85.69	18.94	86.0	21.14	0.05	0.960

P value > 0.05 not significant.

Table (11): Distribution of the studied groups according to special habits .

Groups	special habits			
	Negative		Positive	
	No.	%	No.	%
Mild MR, group	15	60	10	40
Moderate MR, group	21	84	4	16
ADHD group	11	44	14	56
Control group	40	53	35	47

Special habits like using newspaper and magazine, foil in kitchen and wrapping food items by newspaper, usage of cans and use of cohol.

So special habits is classified into either positive or negative .

Table (12): Relation of special habits to IQ and Total Aggression

Variable	negative		positive		t-Value	p-Value
	Mean	SD	Mean	SD		
IQ	80.93	23.45	81.97	21.39	0.28	0.778
Total-Aggression	86.35	19.47	85.06	18.71	0.37	0.707

P value > 0.05 not significant.

Table (13): Relation between the levels of metals in hair and the residence among studied groups

Elements	Urban		Rural		t-value	p-Value
	Mean	SD	Mean	SD		
Pb	4.46	1.09	2.53	0.23	8.33	0.001**
Cd	0.60	0.15	0.53	0.12	1.33	0.184
Zn	173.2	20.1	171.1	23.7	0.50	0.618
Cu	15.43	3.11	16.02	3.24	0.68	0.494

P-value for lead (<0.001) Highly significant **

P-value for other elements (>0.05) not significant.

Table (14): Serum levels of metals studied in control subjects *

Metals	Mean	SD
pb	0.22 ppm	± 0.06
Cd	0.19 ppb	± 0.04
Zn	1.2 ppm	± 0.3
Cu	1.1 ppm	± 0.2

N.B : 25 children represents the serum Levels in control group.

Table (15): Correlation studies between serum and hair levels of metals

metals	r	p
Pb	-0.06	> 0.05
Cd	-0.23	> 0.05
Zn	0.03	> 0.05
Cu	0.05	> 0.05

P-value (> 0.05) not significant .

Table (16): Correlation studies between BMI to IQ, Total Aggression and Pb

metals	r	p
IQ	0.52	< 0.05*
Total aggression	-0.45	< 0.05*
Pb	-0.27	< 0.05*

p-value (< 0.05) significant*

Table (17):Correlation studies between hair levels of metals to IQ, Total-Aggression

Elements	IQ		Total Aggression	
	r	P	r	P
Pb	-0.47	< 0.05*	0.48	< 0.05*
Cd	-0.19	> 0.05	0.07	> 0.05
Zn	-0.14	> 0.05	0.11	> 0.05
Cu	0.4	> 0.05	-0.05	> 0.05

P-value (< 0.05) Significant*

Figure (1): Residence among studied groups

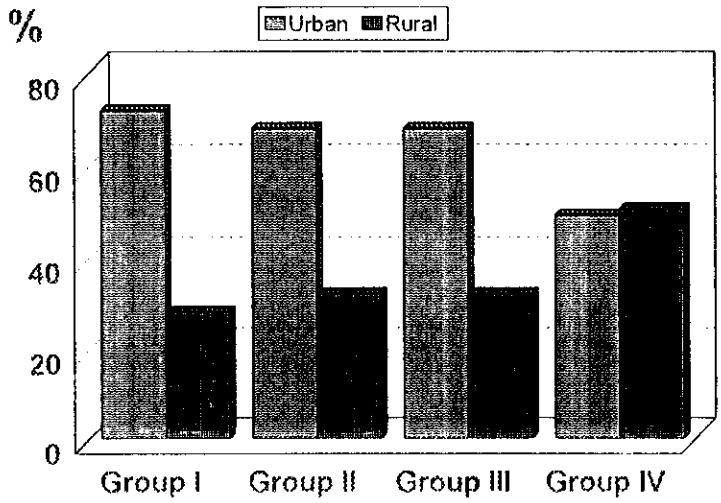


Figure (2): weight, length, BMI among studied grous

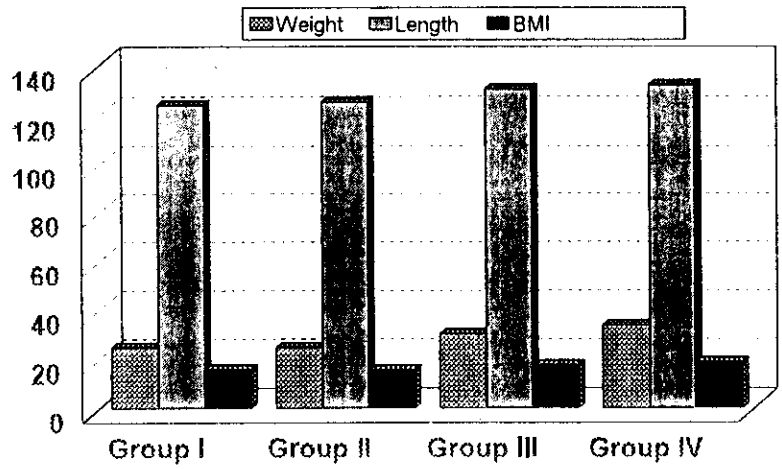


Figure (3): IQ, Total-aggression among studied groups

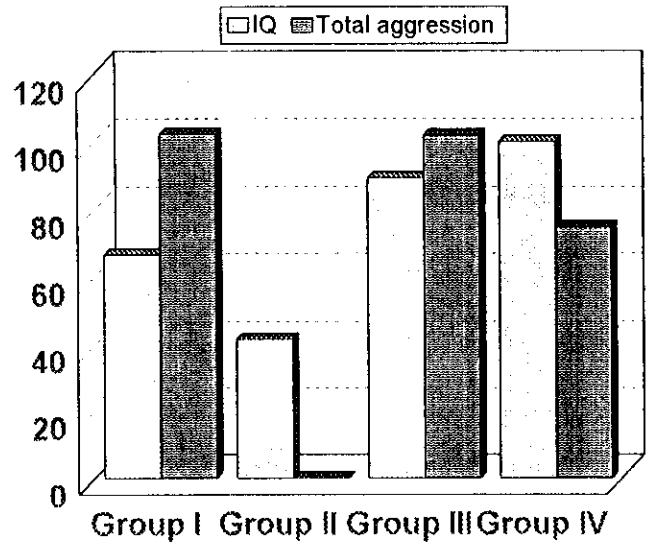


Figure (4):Pb, Cd Hair levels among studied groups

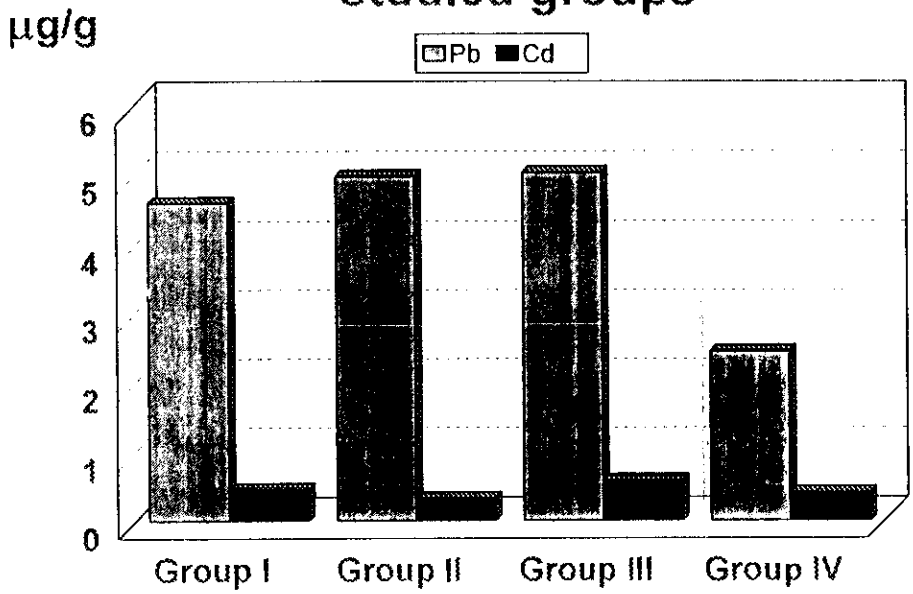


Figure (5): Zn, Cu Hair levels among studied groups

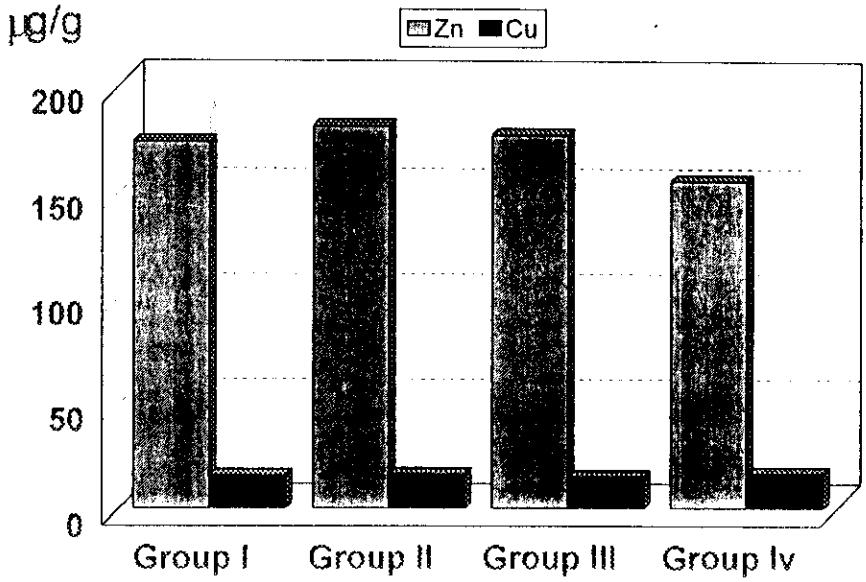


Figure (6) : Correlation Between Pb level and IQ score

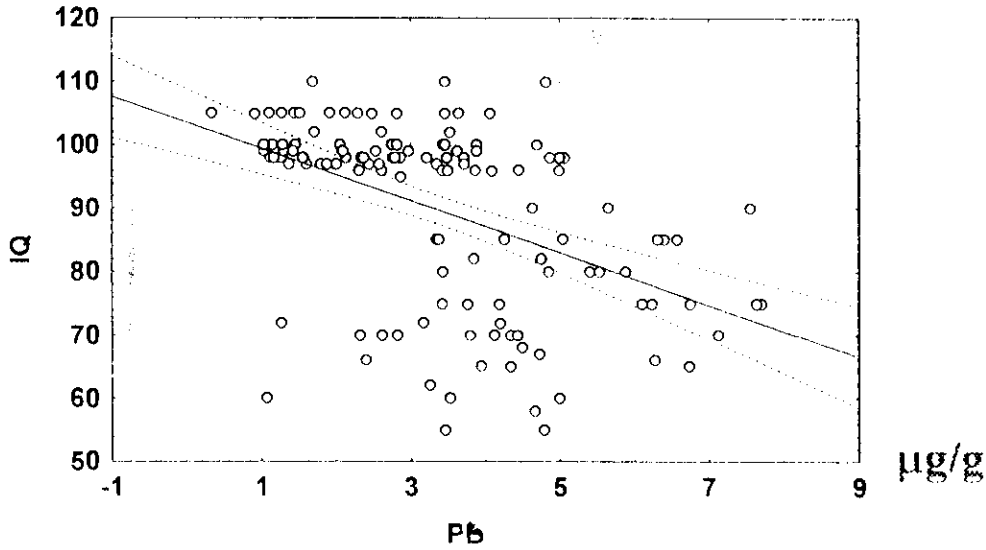


Figure (7): Correlation between Pb level and Total aggression score

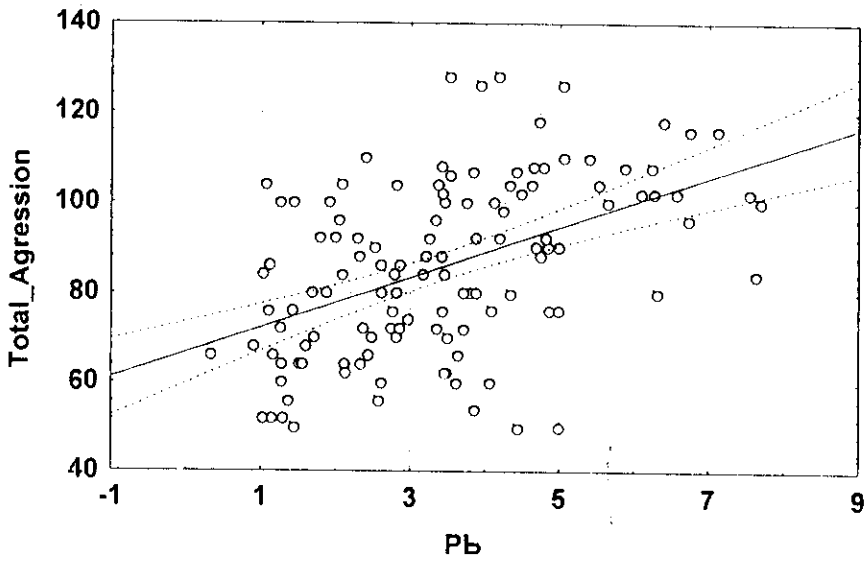
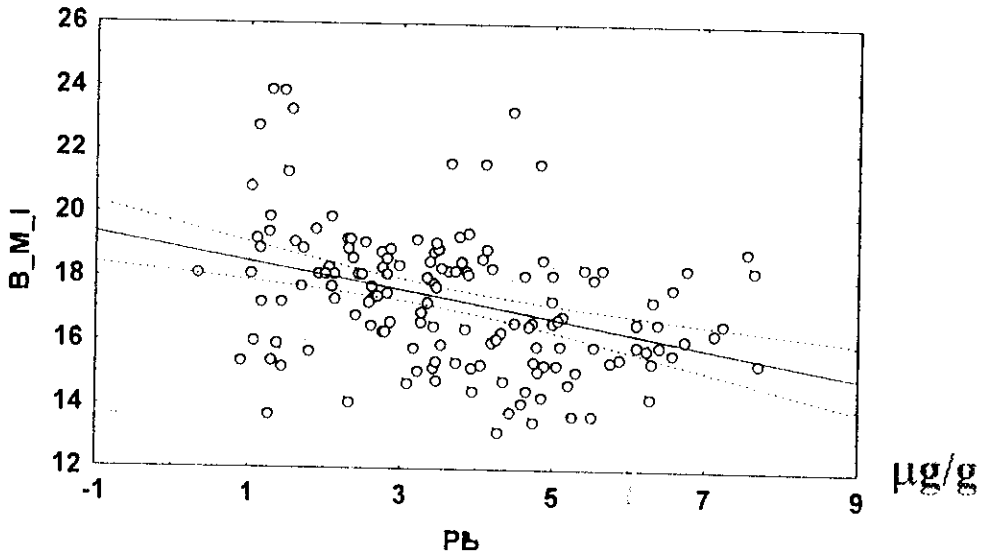


Figure (8): Correlation between Pb level and BMI



Analysis of the results

Table (1) Shows distributions of the studied groups according to residence .

Table (2) Shows distributions of studied groups according to socioeconomic status.

Table (3) Shows weight, height and BMI among studied groups .

For weight, there is a highly significant difference when comparing studied groups with control group (p- value<.0.01) .

For height there is a significant difference when comparing studied groups with control group (p-value<0.05) .

For BMI There is a highly significant differene when comparing studied group with control group (p-value< 0.01) .

Table (4) Shows IQ, total aggression among studied groups .

N.B Total aggression couldn't be done with moderate MR group.

Table (5) There is significant increase in Pb level in mildMR group than control group . (p-value < 0.05)

There is highly significant increase in Pb level; in moderateMR, ADHD groups than control group (p-value < 0.01) .

Table (6) There is a significant increase in Cd level in mild MR and ADHD groups than control group (p-value < 0.05) .

There is significant decrease in Cd level in moderareMR group than control (p-value < 0.01)

Mean and median are quite close in studied groups.

Table (7) Comparison of Zn level in control group with different studied groups reflect a significant difference as (p-value<0.05).

Table (8) Comparison of Cu level in control group with studied groups denotes no significant difference among studied groups as (p-value.> 0.05)

Mean and median value of Cu level are quite close in studied groups.

Table (9) Shows distribution of studied groups according to parent's job.

Table (10) Relation of IQ and Total aggression between positive and negative parent's job revealed that no significant relations as (p-value >0.05) .

Table (11) Shows distribution of studied groups according to special habits .

Table (12) There is no statistical significance difference between positive and negative special habits in relations to IQ and Total aggression among studied groups (p-value >0.05)

Table (13) Statistical study of hair levels of metals with the residence among studied groups, revealed that Pb concentrations of scalp hair in all subjects living in urban areas was highly significant study when compared to living in rural areas.

No similar significant difference was found in other metals studied (Cd,Zn and Cu).

Table (14) Demonstrate the serum level of metals studied in control subjects.

Table (15) Revealed no correlation between serum and hair levels of four metals (p-value>0.05) .

Table (16) Shows correlation studies between BMI to IQ ,Total aggression and Pb.

There is a significant positive correlation between BMI and IQ (r 0.52 p-value <0.05) .

There is a significant negative correlation between BMI and Total aggression (r -0.46 p-value.<0.05)

There is a significant negative correlation between BMI and Pb (r -27 p-value .<0.05) .

Table (17) Shows correlation studies between hair levels of metals to IQ, Total aggression.

There is a significant negative correlation between Pb level and IQ (r-0.47 p-value ,0.05) .

There is a significant positive correlation between Pb level and Total aggression (r 0.48 p-value <0.05).

There is no correlation between Cd level and IQ (r -0.19 p-value >0.05) .

There is no correlation between Cd level and Total aggression score (p-value > 0.05).

There is no correlation between Zn level to IQ and Total aggression score (p-value > 0.05)

There is no correlation between Cu level to IQ and Total aggression score (p- value >0.05)