Results

Table (1) Demographic data among studied groups

	Cases(25)	Control(25)	Z / (t)	P
Age (years)				
Range	10-16	10-16		
Mean ±S.D	13.06±2.5	13.1±2.1	0.45	> 0.05
Sex				
Male				
No	13	11		
%	52	44		> 0.05
female			0.56	
No	12	14		
%	48	56		
Locality				
Urban				
No	10	11		
%	40	44		> 0.05
rural			0.28	
No	15	14		
%	60	56		

Table (1) shows no significant difference in age, sex and residence between cases and control group.

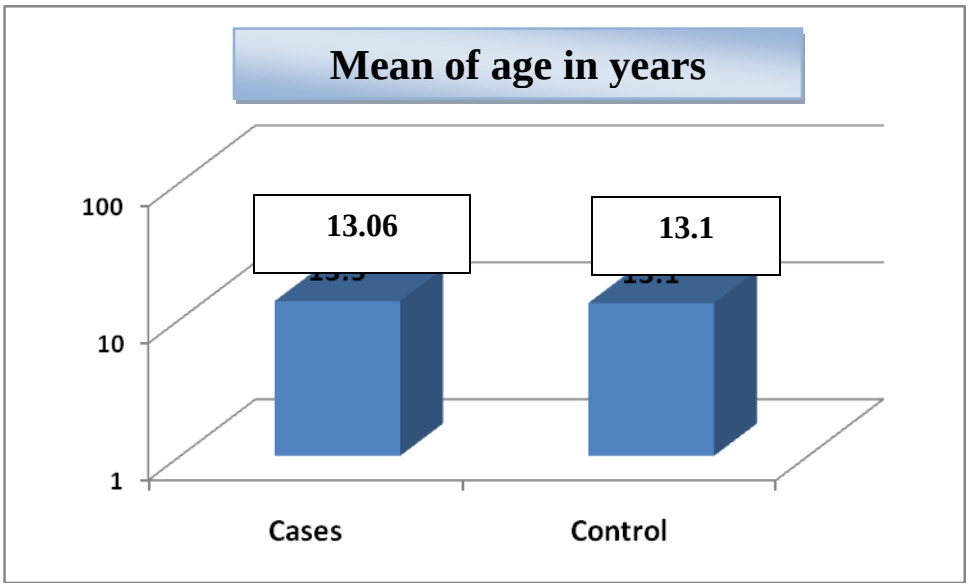

Figure 1a: Mean age in years in studied groups.

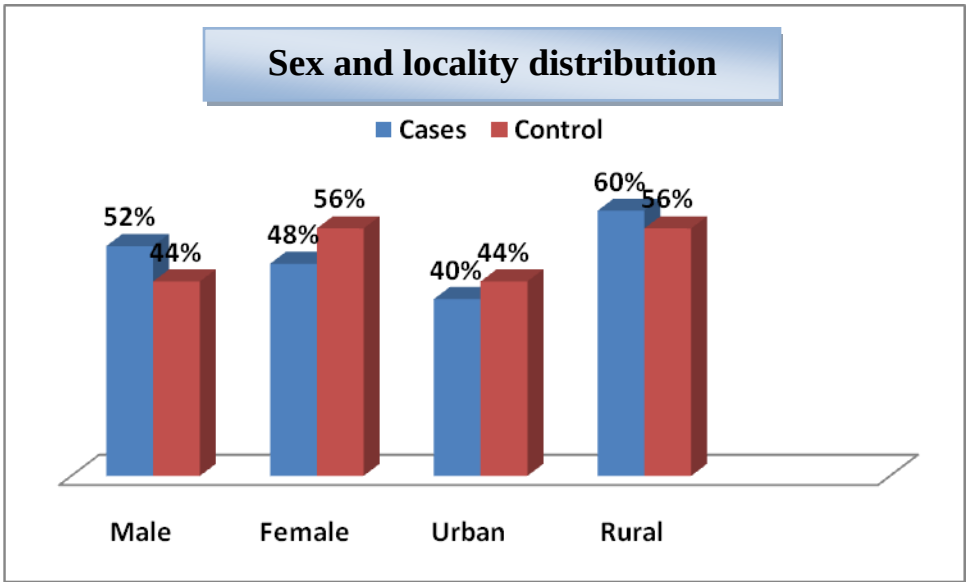

Figure 1b: Distribution of sex and locality among studied groups.

Table (2) Distribution of studied cases regarding the etiology of liver disease

Etiology	Frequency	
	No	%
Chronic Hepatitis C	11	44
AIH 1	6	24
Chronic Hepatitis B	4	16
GSD1	2	8
Congenital hepatic fibrosis	1	4
Alpha1 anti-trypsin deficiency	1	4
Total	25	100

Table (2) shows the different causes of chronic liver diseases in our cases and chronic Hepatitis C constituted the higher percentage of our cases.

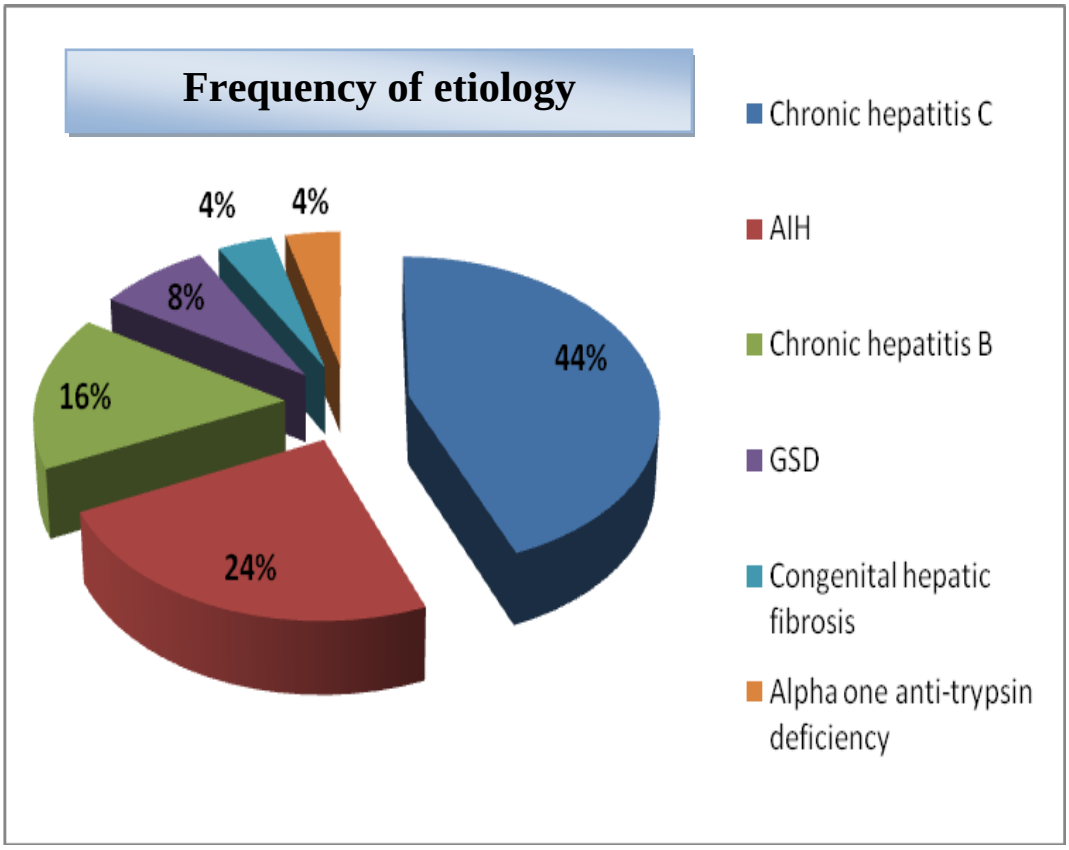

Figure 2: Frequency of causes of chronic liver disease among our studied cases

Table (3) Clinical characteristics of studied cases

	Frequency	
	No	**%**
Hepatomegaly	16	64
Splenomegaly	16	64
Jaundice	10	40
Pallor	7	28
Portal hypertension	5	20
Ascites	3	12
Lower limb edema	1	4
Short stature(height below 3rd centile)	7	28
Weight below 3rd centile	3	12
Over weight(BMI above 85 centile)	3	12
Secondary sexual changes in relation to age		
Normal	19	76
delayed	6	24

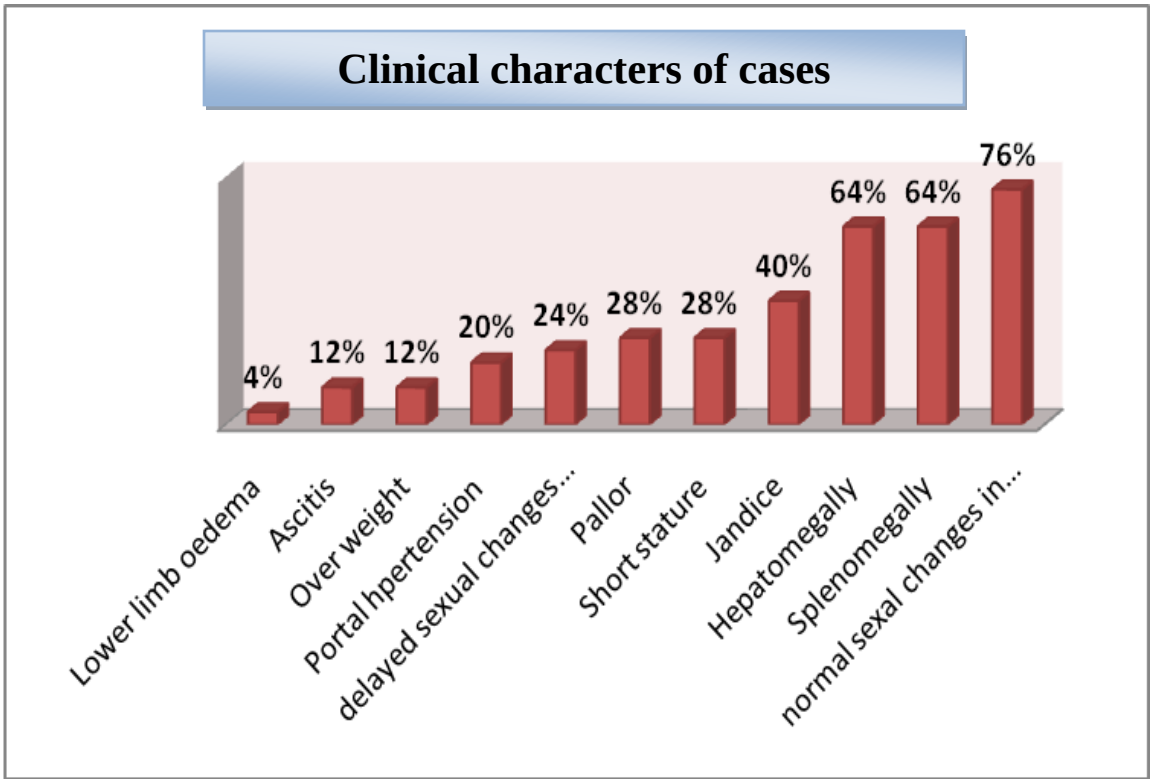

Figure 3: Clinical characters of cases

Table (2) and figure (3) show the clinical examination data of our cases and splenomegaly and hepatomegaly were the most clinical findings.

Table (4): Anthropometric measurements among cases and control group

	Cases		Control		T	P
	mean	**S.D.**	**Mean**	**S.D**		
Height (cm)	144.6	16.6	151.6	11.3	2.7	> 0.05
Height percentile	26	29	56	18	2.6	< 0.05*
Height Z score(SDS)	-0.643	0.59	0.151	0.91	2.45	< 0.05*
Weight (kg)	43.7	18	45.4	10.4	0.40	> 0.05
Weight percentile	36.8	28	38.1	14.3	0.30	> 0.05
Weight Zscore(SDS)	-0.340	0.51	-0.296	1.08	0.36	> 0.05
BMI (kg/m2)	21.4	4.5	19.3	21	0.07	> 0.05
BMI percentile	55.2	30	41.5	21	0.06	> 0.05
BMI Z score (SDS)	0.136	0.52	-0.254	0.81	0.09	> 0.05

SDS=Standard deviation score

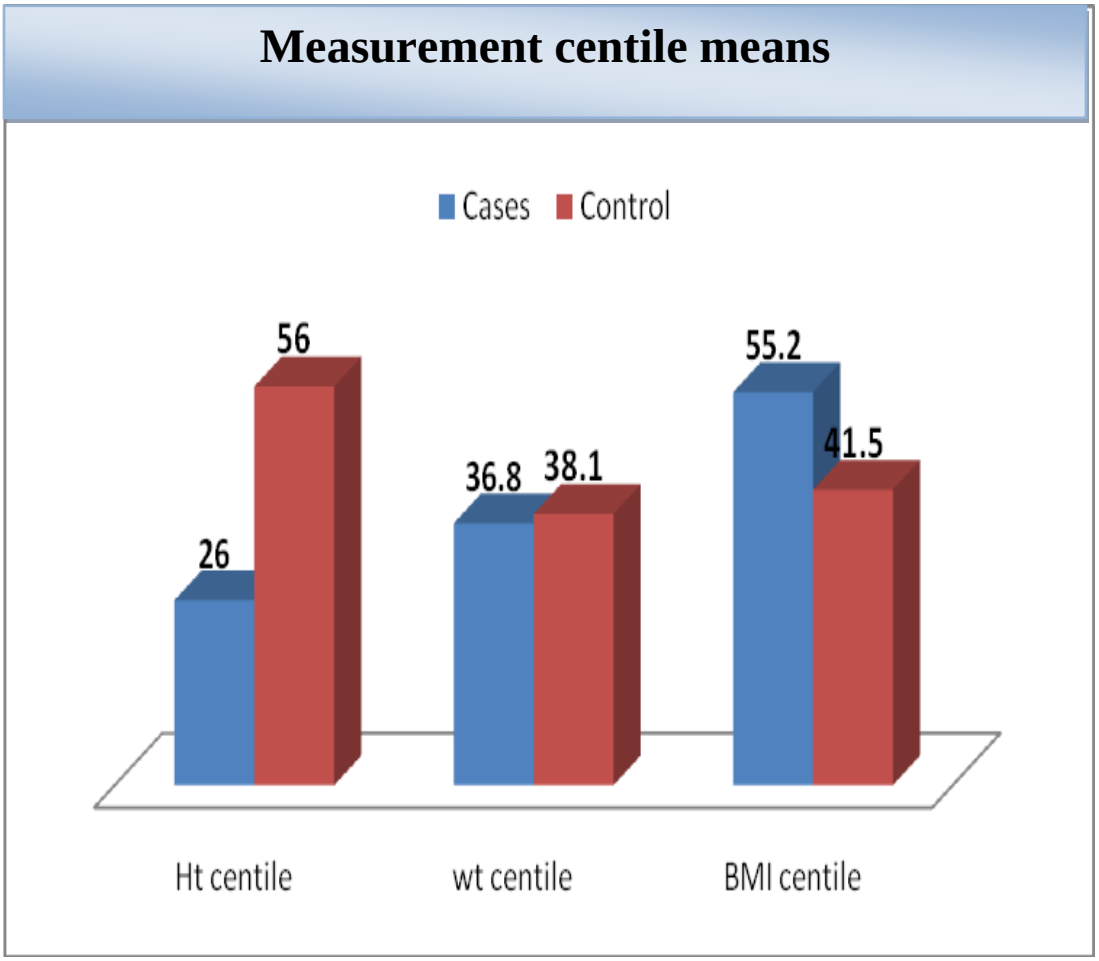

Figure 4: Mean percentiles of height, weight and BMI in studied groups.

Table and fig (4) show significant difference between cases and control group as regard height percentile and Z score with no significant difference between the two groups regarding weight and BMI.

Table (5) Prevalence of pubertal changes in studied cases.

		Cases	
		NO	%
Delayed puberty	**Total**	**6**	**24**
	male	**4**	**16**
	female	**2**	**8**
Normal puberty	**Total**	**19**	**76**
	male	**9**	**36**
	female	**10**	**40**
Primary amenorrhea		**1**	**4**
Secondary amenorrhea		**2**	**8**
Irregular menstruation		**3**	**12**

Table (5) shows more incidence of delayed puberty among males compared to females. Also menstrual abnormalities are common among females.

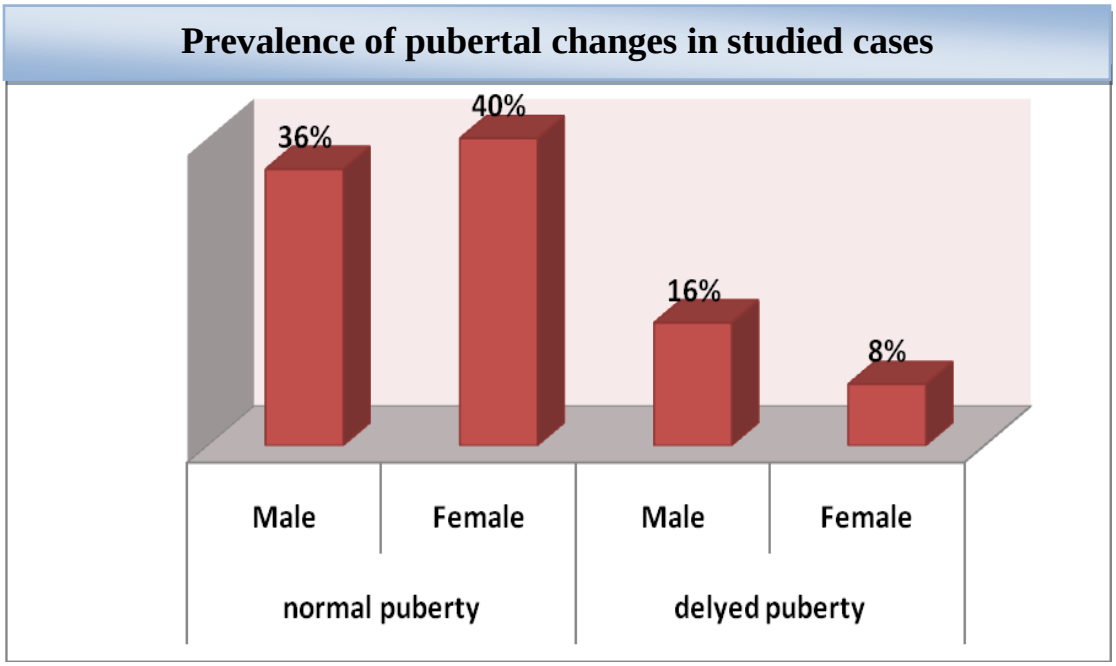

Figure 5a: Prevalence of pubertal changes in studied cases.

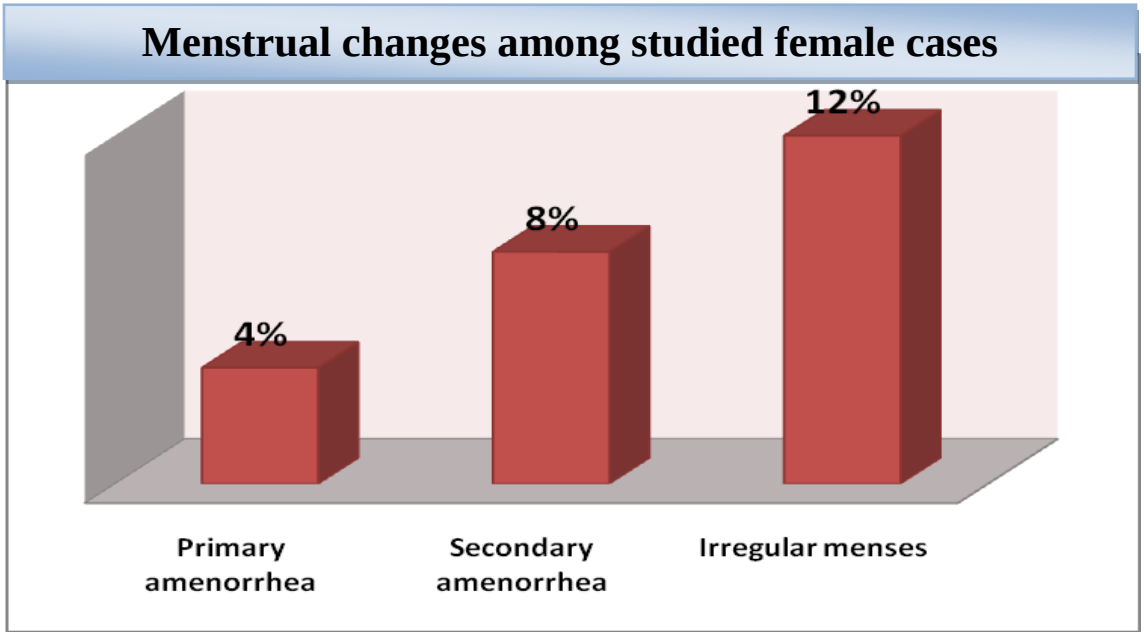

Figure 5b: Menstrual changes among studied female cases.

Table (6): Age of menarche in females in the studied groups.

Age of menarche	Cases	Control	t	P
Mean &S.D	13.9 ±1.2	13.6 ±1.4	0.81	> 0.05

Table (6): Shows no significant difference as regard age of menarche between studied groups.

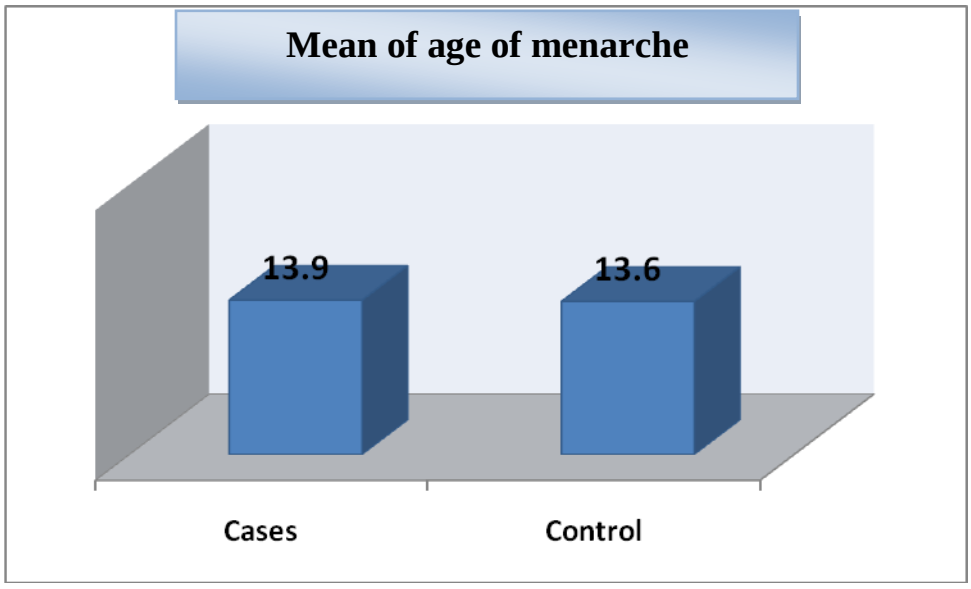

Figure 6: Mean age of menarche among studied females in both groups.

Table (7): Comparison between cases and control group regarding liver function tests

	Cases	Control	(t)	P
AST (IU/L)				
▪ **Range**	12- 430	17- 40		
▪ **Mean±S.D.**	72.3± 88	23.3± 5.6	2.7	< 0.01**
ALT (IU/L)				
▪ **Range**	10- 625	15- 36		
▪ **Mean± SD**	77.4± 120	22.8± 6.1	2.25	< 0.05*
Total billirubin mg/dl				
▪ **Range**	0.3- 6.6	0.2- 1		
▪ **Mean±SD**	2.6±1.8	0.66±0.24	5.4	< 0.001**
Direct billiruban (mg/dl)				
▪ **Range**	0.09-2.1	0.01-0.18		
▪ **Mean±SD**	0.81 ± 0.71	0.056±0.05	5.3	< 0.001**
S albumin (gm/dl)				
▪ **Range**	2.1-4.8	3.8 – 5.1		
▪ **Mean±SD**	3.3 ± 0.72	4.43 ± 0.44	6.2	< 0.001**
Prothrombin time PT(sec)				
▪ **Range**	11.5- 18	11- 13		
▪ **Mean±SD**	13.4±1.8	12.2±0.44	3.2	< 0.01**
Prothrombin concentration PC %	54- 100	95- 110		
▪ **Range**	84.8±16.9	99±3.1	4.2	< 0.01* *
▪ **Mean±SD**				

Table (7): Shows highly significant difference between studied groups as regard serum transaminases level, serum albumin ,total and direct serum billirubin, prothrombin time and concentration.

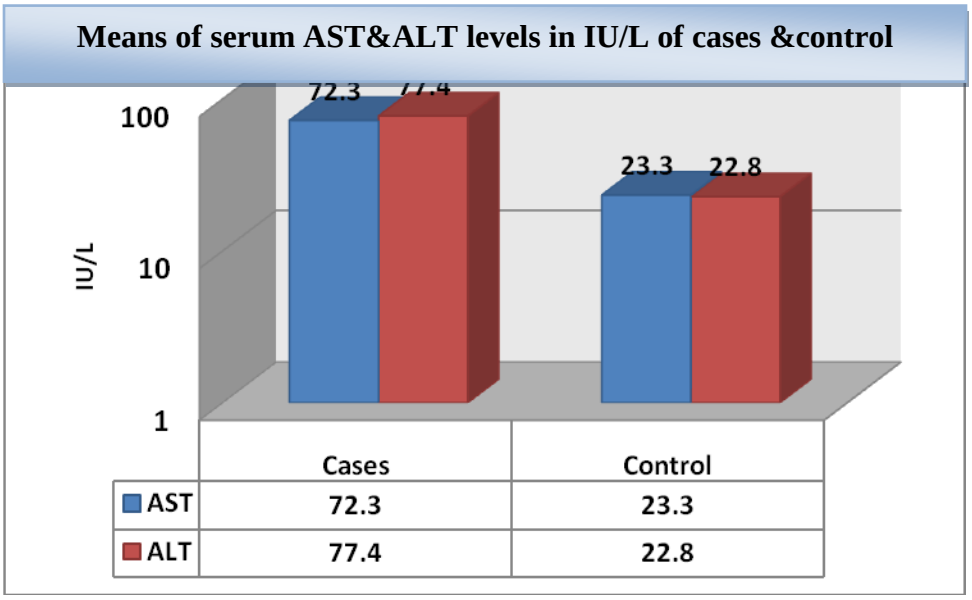

Figure 7a: Means of serum AST&ALT levels in IU/L of cases &control

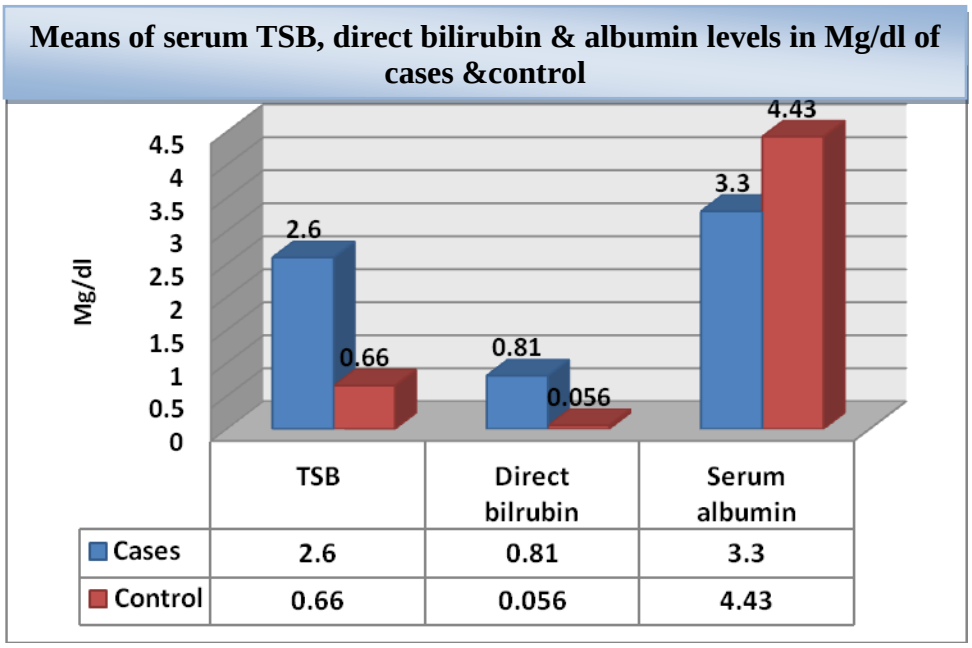

Figure 7b: Means of serum TSB, direct bilirubin & albumin levels in Mg/dl of cases &control

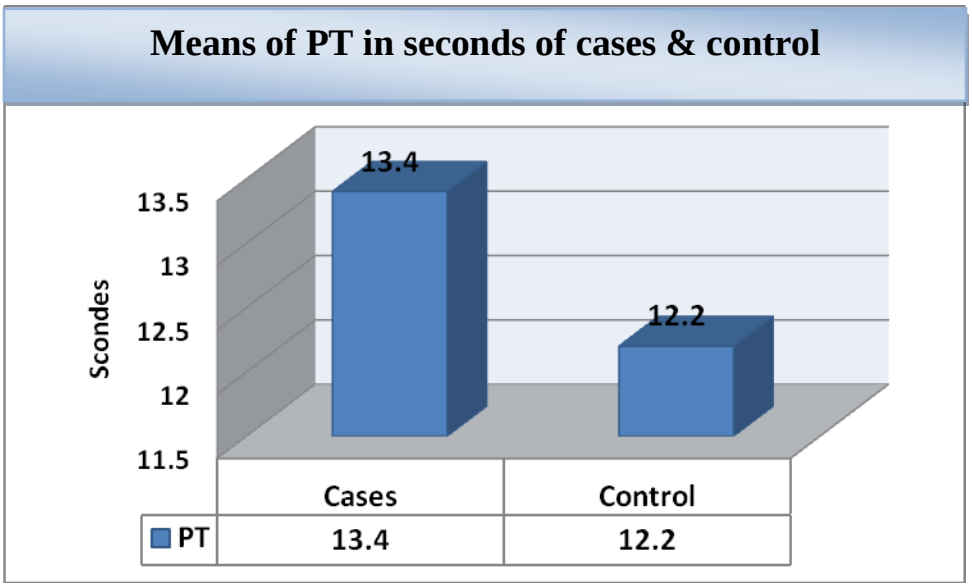

Figure 7c: PT in seconds among studied cases and control group.

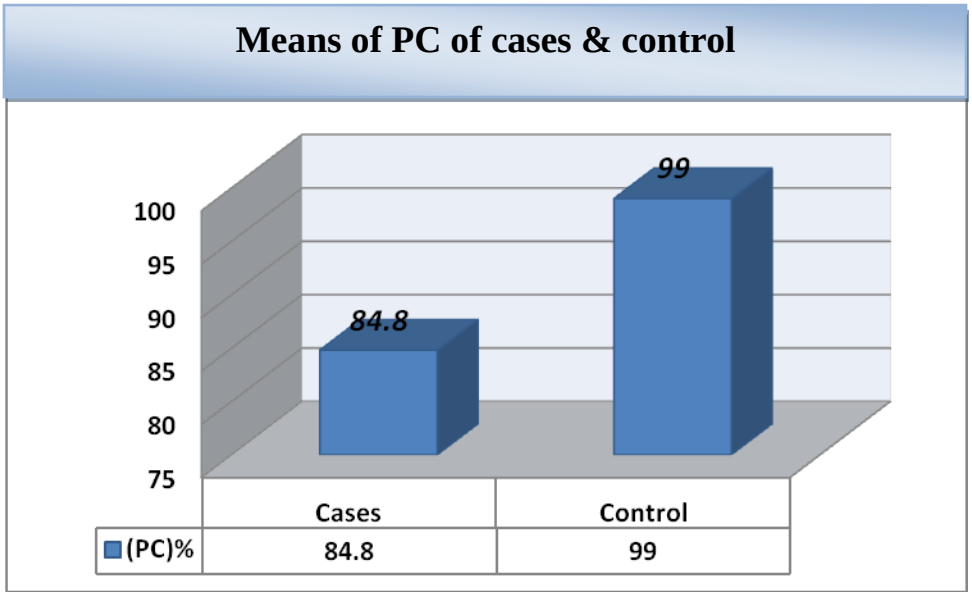

Figure 7d:PC in cases and control group.

Table (8): Serum TGFβ levels in cases and control groups

	Cases	Control	t	P
TGFβ (ng/ml)				
Range	12.3- 45.1	9.8- 20.7		
Mean±SD	25±10.3	14.9±3	4.6	< 0.001**

Table (8): Show high significant difference between cases and control as regard serum levels of T GFβ.

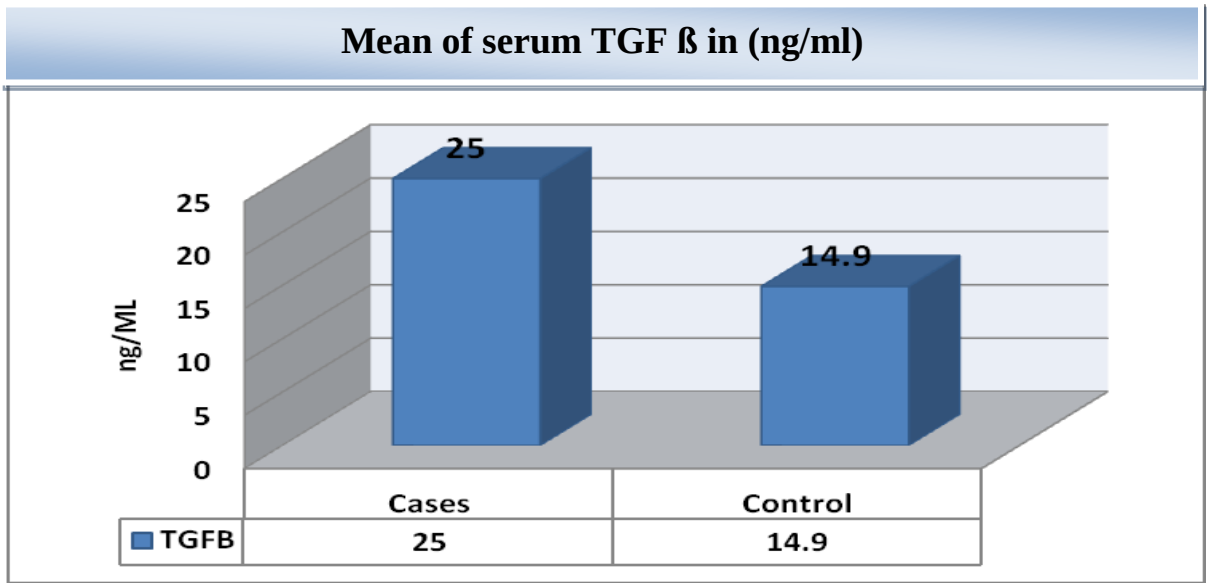

Figure 8: Mean serum levels of TGFβ in studied groups.

Table (9): Sensitivity, specificity and accuracy of TGFβ as a diagnostic marker of liver fibrosis.

	Percent%
Sensitivity	65
Specificity	94
Accuracy	85

- **Area under the curve = 0.8125**
- **Positive predictive value=75.4%**
- **Negative predictive value=90.5%**
- **The best cutoff value = 22.6 ng/ml**

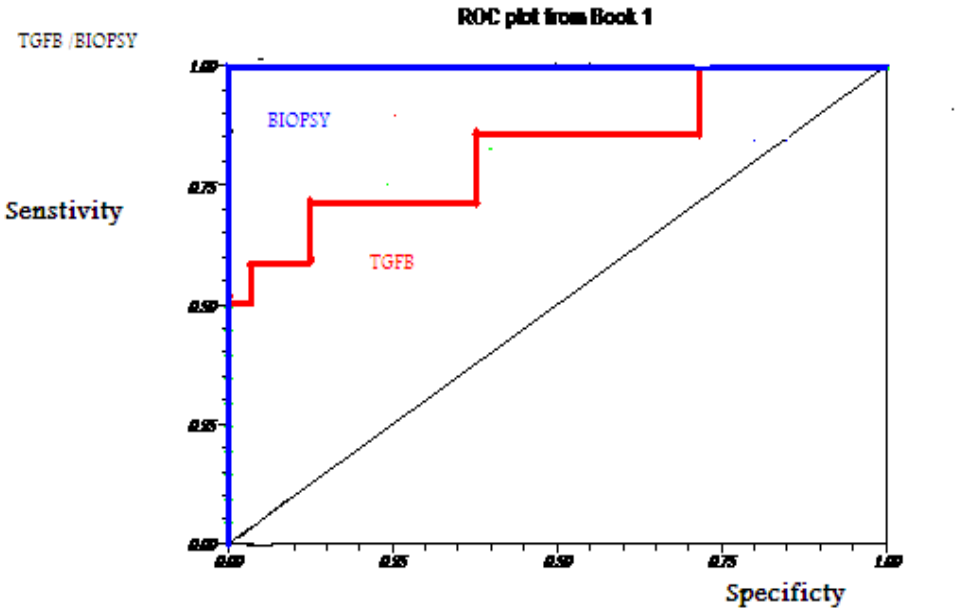

Figure 9:Nonparametric receiver operating charachteristic(ROC) curve for assessing the diagnostic value of TGFβ as an indicator of liver fibrosis.

Table (10): Correlation between TGFβ and other parameters.

TGFβ	r	P
Age	- 0.0319	>0.05
Duration	0.5952	< 0.01*
PT	0.5293	< 0.01*
PC	-0.6460	< 0.01**
Serum albumin	-0.5371	< 0.01**
TSB	0.4682	< 0.05*
AST	0.3749	>0.05
ALT	0.2715	>0.05
Stage of liver fibrosis	0.9409	< 0.001**
Grade	0.7447	<0.01**
Delayed puberty	0.4694	< 0.05*
Stunting	0.4391	< 0.05*

This table shows significant positive correlation between TGFβ, and (TSB,delayed puberty and stunting) and highly significant positive correlation with (stage and grade of liver biopsy,PT and duration of illness) Also shows highly significant negative correlation with PC and serum albumin level.

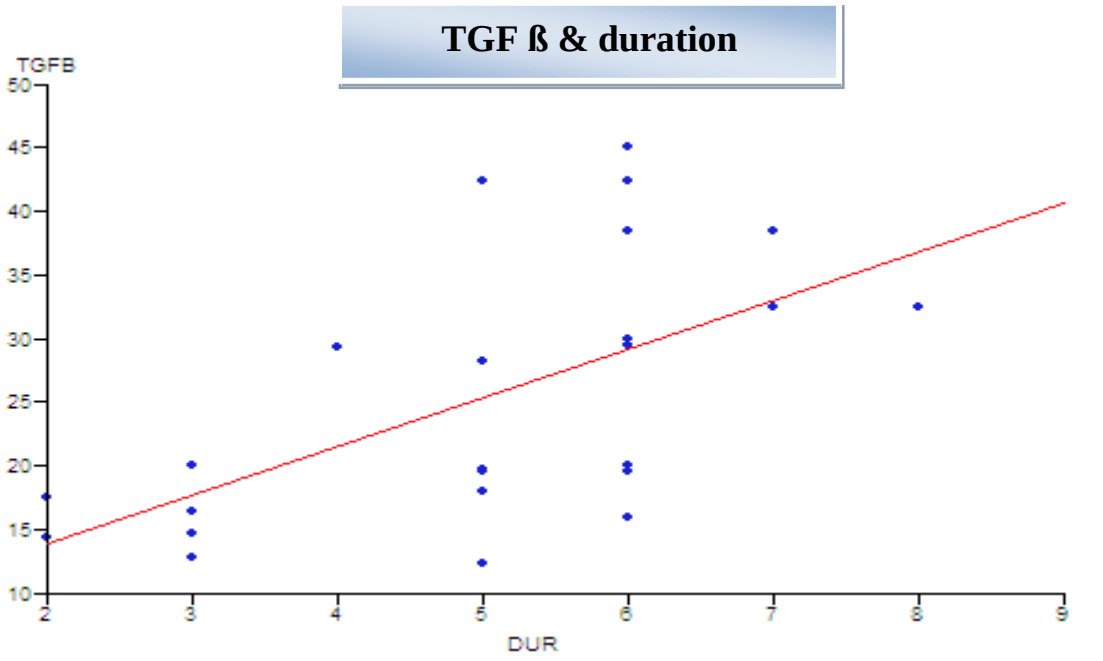

Figure 10a: Correlation between TGFβ and duration.

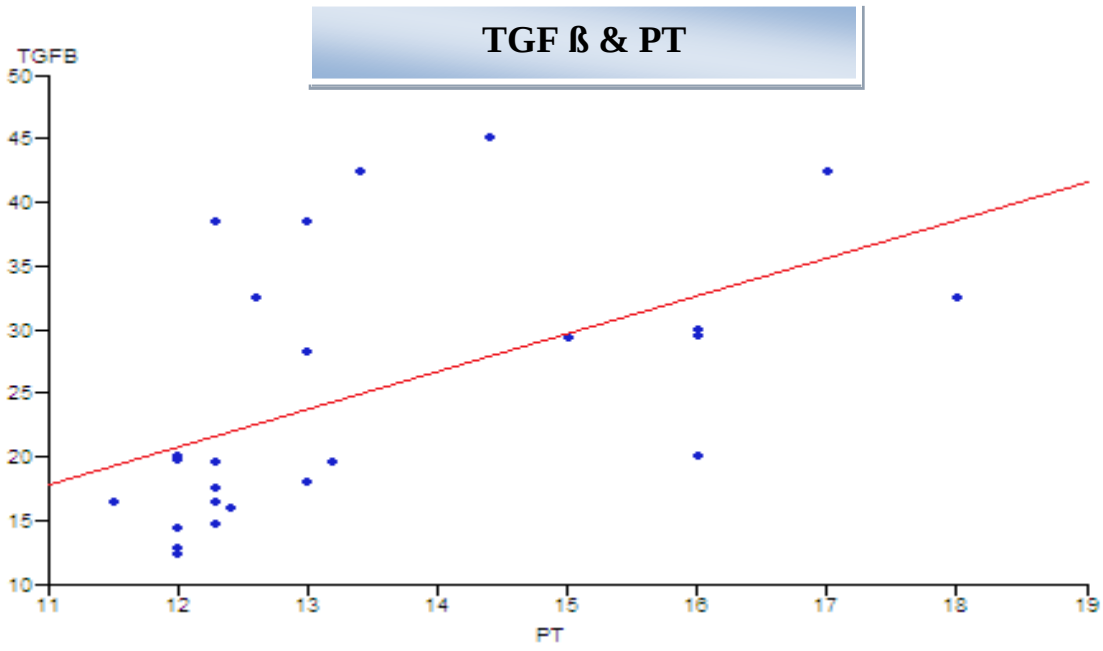

Figure 10b: Correlation between TGFβ and PT.

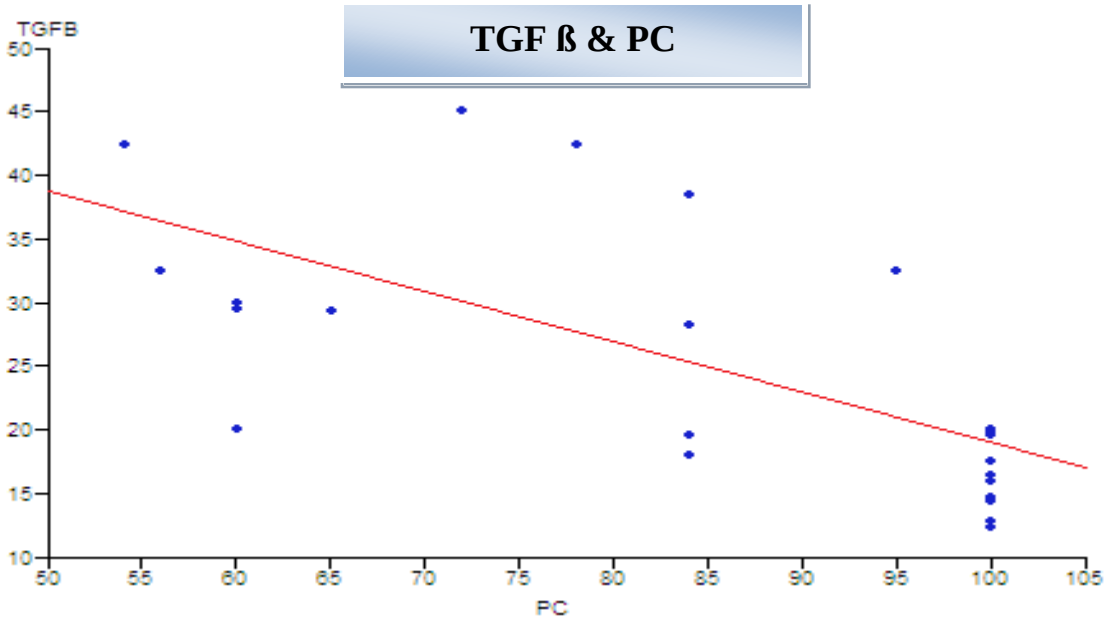

Figure 10c: Correlation between TGFβ and PC.

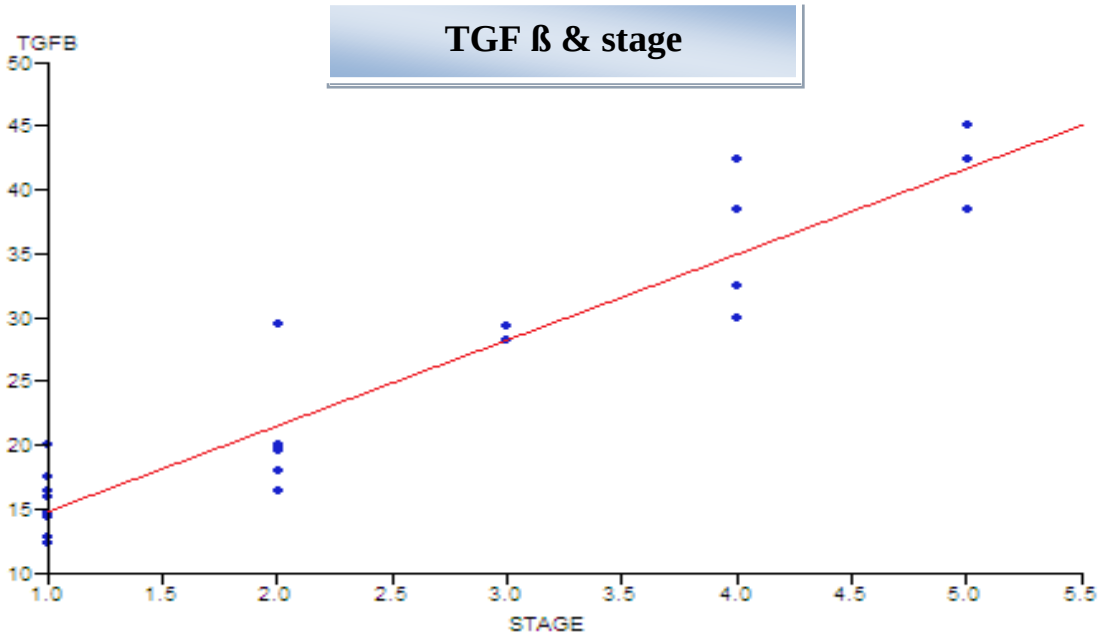

Figure 10d: Correlation between TGFβ and stage of liver biopsy.

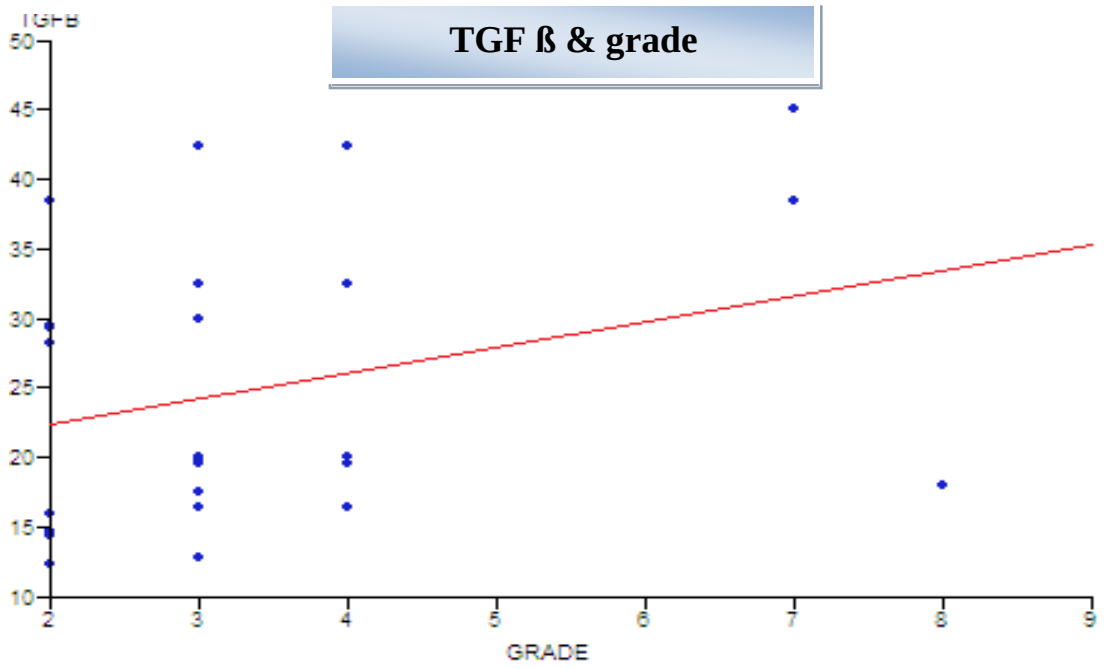

Figure 10e: Correlation between TGFβ and grade of liver biopsy.

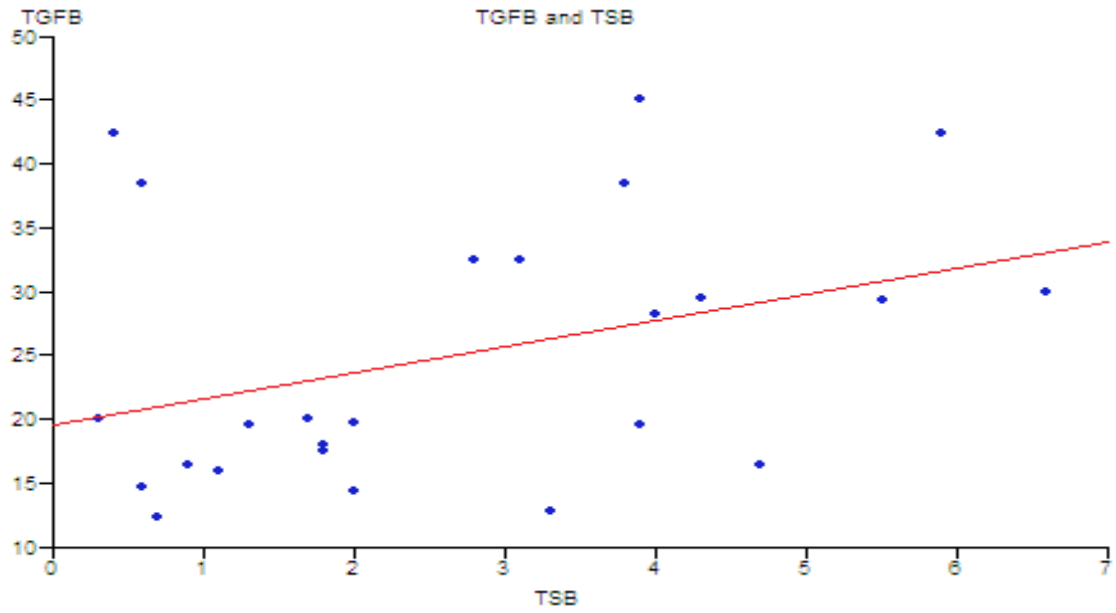

Figure 10f: Correlation between TGFβ and TSB.

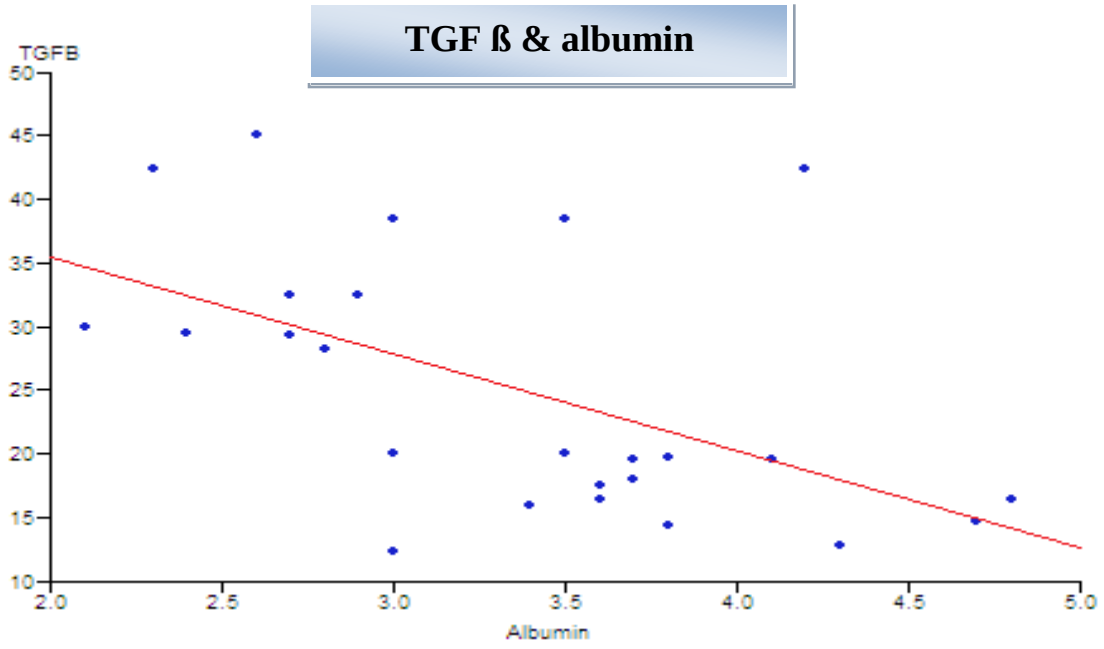

Figure 10c: Correlation between TGFβ and serum albumin level.

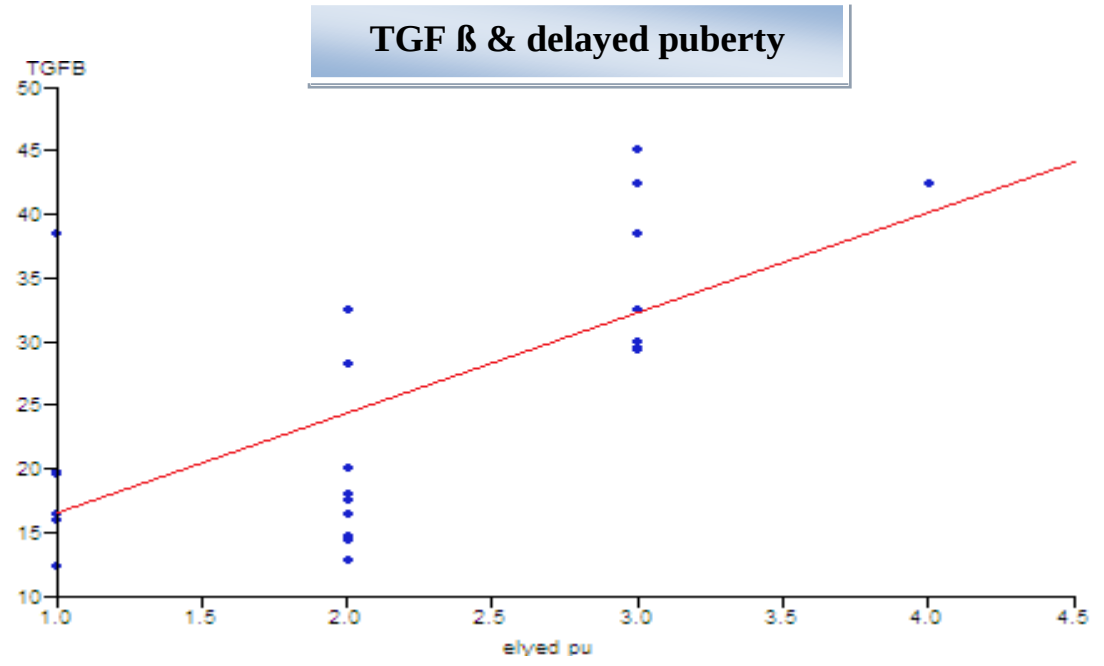

Figure 10c: Correlation between TGFβ and delayed puberty.

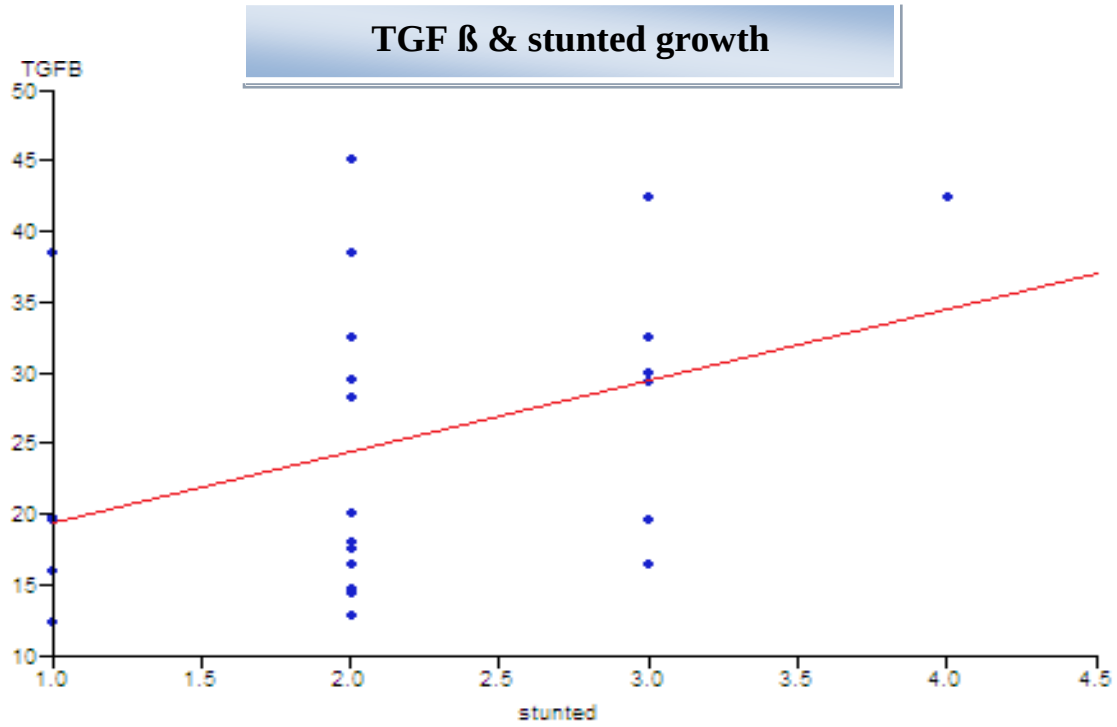

Figure 10c: Correlation between TGFβ and stunted growth.

Table (11): Comparison between case and control group regarding serum IGF1 levels.

	Cases	Control	t	P
IGF1 (ng/ml)				
Range	35- 336	133- 600		
Mean±SD	162.5±84	348±131.5	5.8	< 0.001**

Table (11): Shows highly significant difference between serum levels of IGF1 in case and control groups.

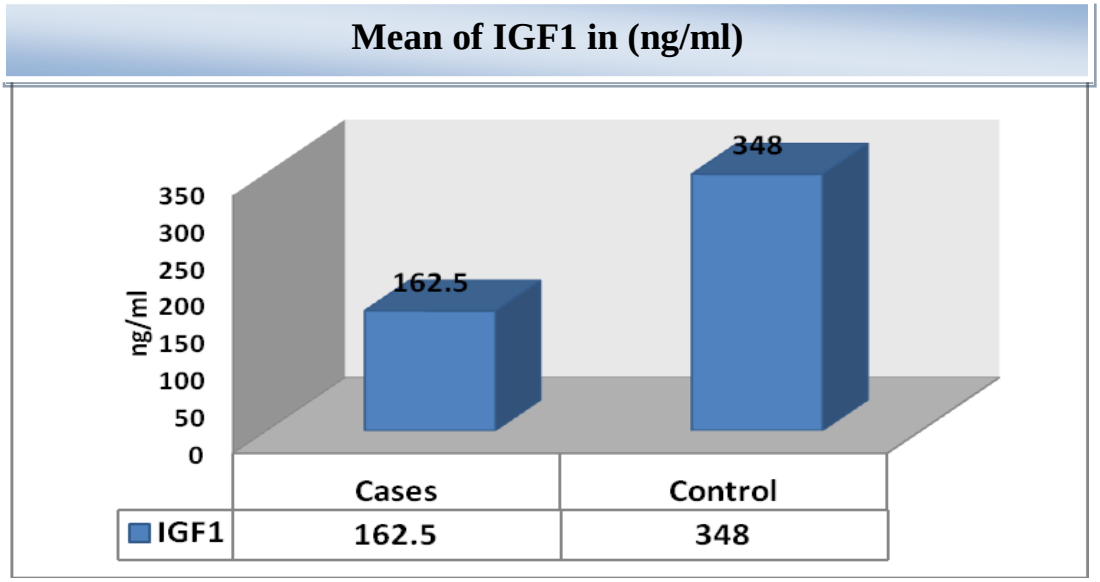

Figure 11: : Mean serum levels of IGF1 in studied groups.

Table (12): Correlation between IGF1 and other parameters.

	r	P
Age	-0.1439	>0.05
Duration	0.3429	>0.05
AST	-0.4907	< 0.05*
ALT	-0.1833	>0.05
Serum albumin	0.4873	< 0.05*
TSB	-0.2624	>0.05
PT	-0.6615	< 0.001**
PC	0.6619	< 0.01**
Stage of liver fibrosis	-0.4103	< 0.05*
Grade	-0.187	>0.05
Stunting	-0.7728	< 0.001**
Delayed puberty	-0.6944	< 0.001**
TGFß	-0.4883	<0.05*

Table (12): Shows a significant positive correlation with (serum albumin level) and high significant positive correlation with(PC) and a significant negative correlation with (AST and stage of liver biopsy and TGFβ) and a highly significant negative correlation with (PT ,delayed puberty and stunting) .

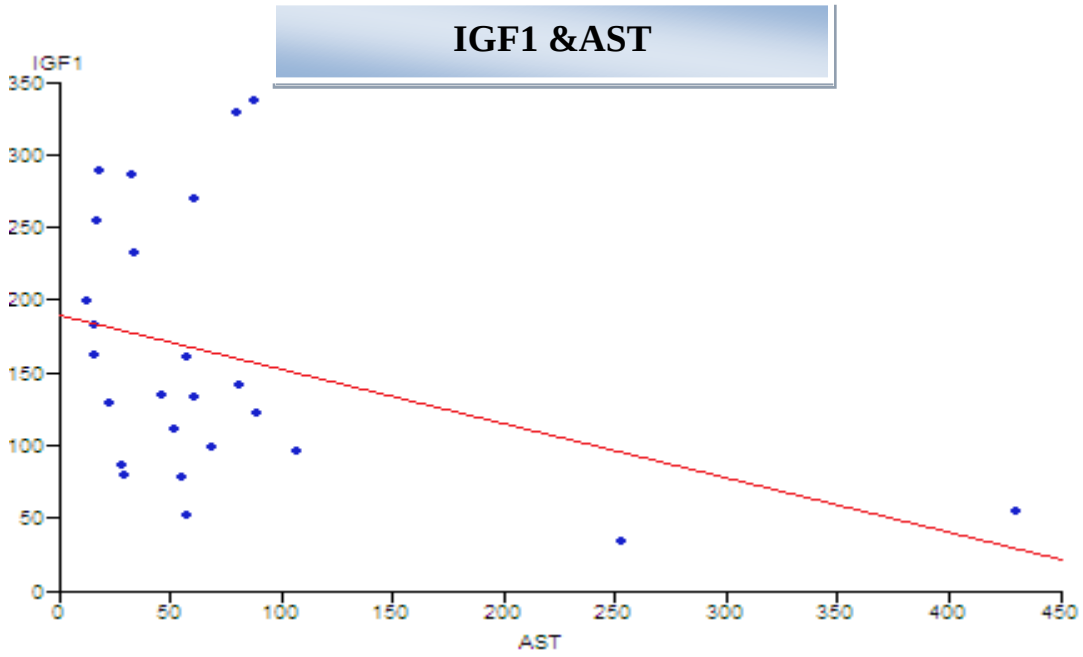

Figure 12a: Correlation between IGF1 and AST.

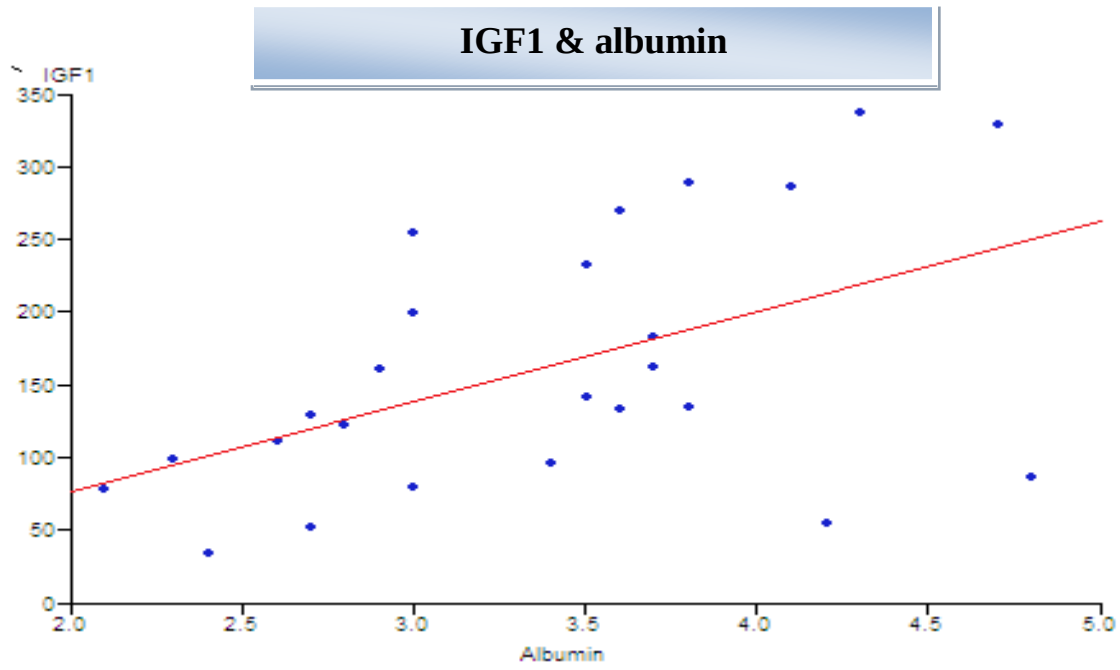

Figure 12b: Correlation between IGF1 and serum albumin levels.

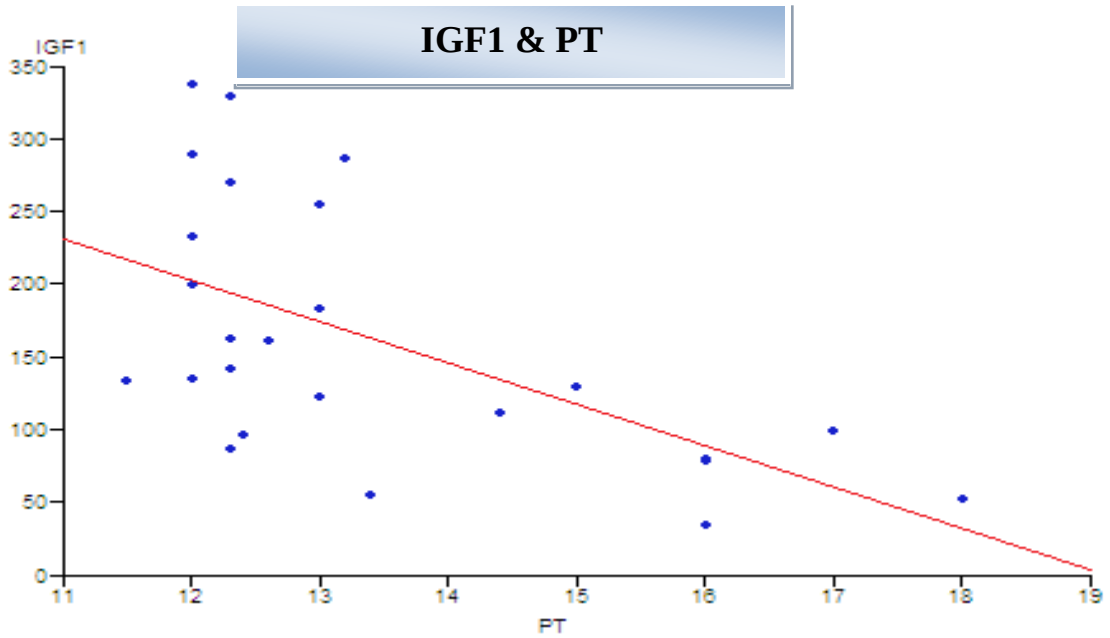

Figure 12c: Correlation between IGF1 and PT

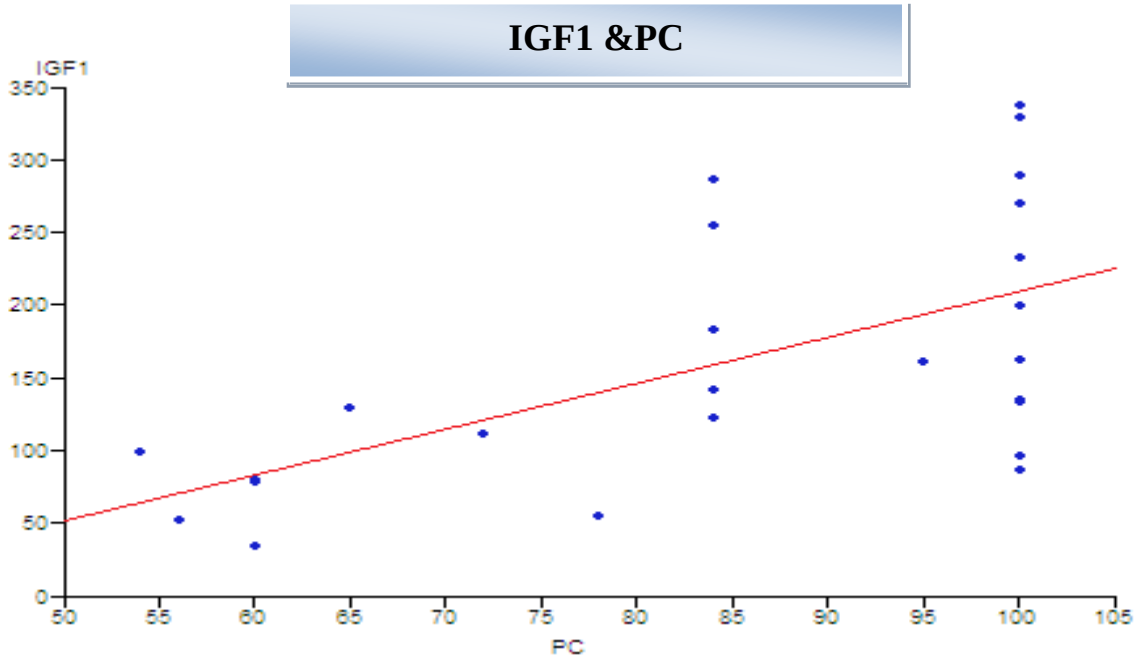

Figure 12d: Correlation between IGF1 and PC

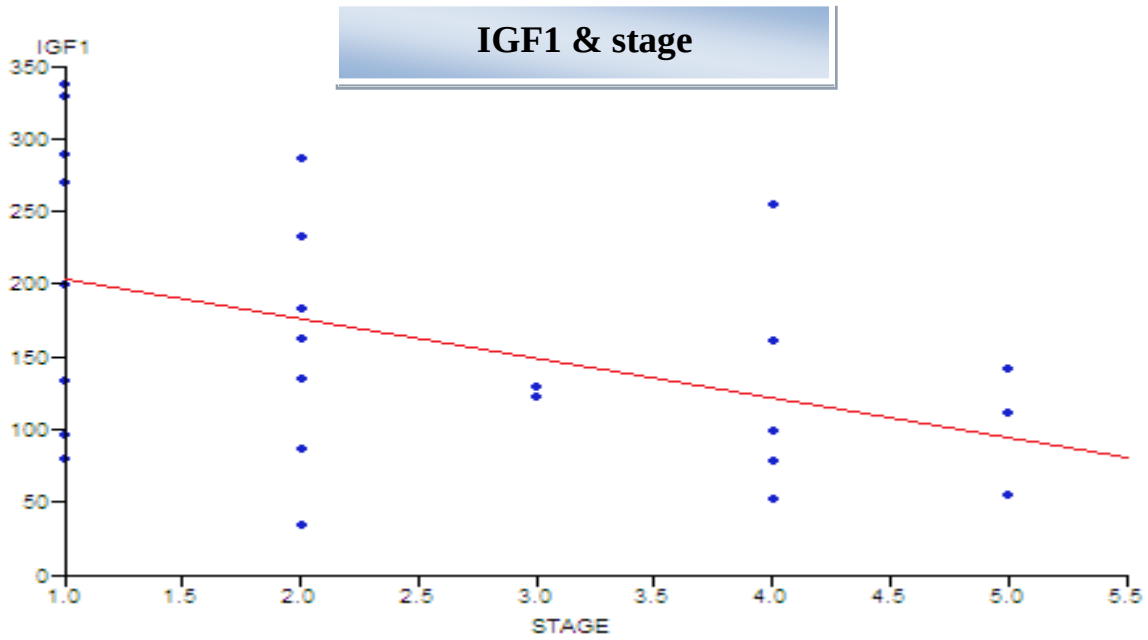

Figure 12e: Correlation between IGF1 and stage of liver biopsy.

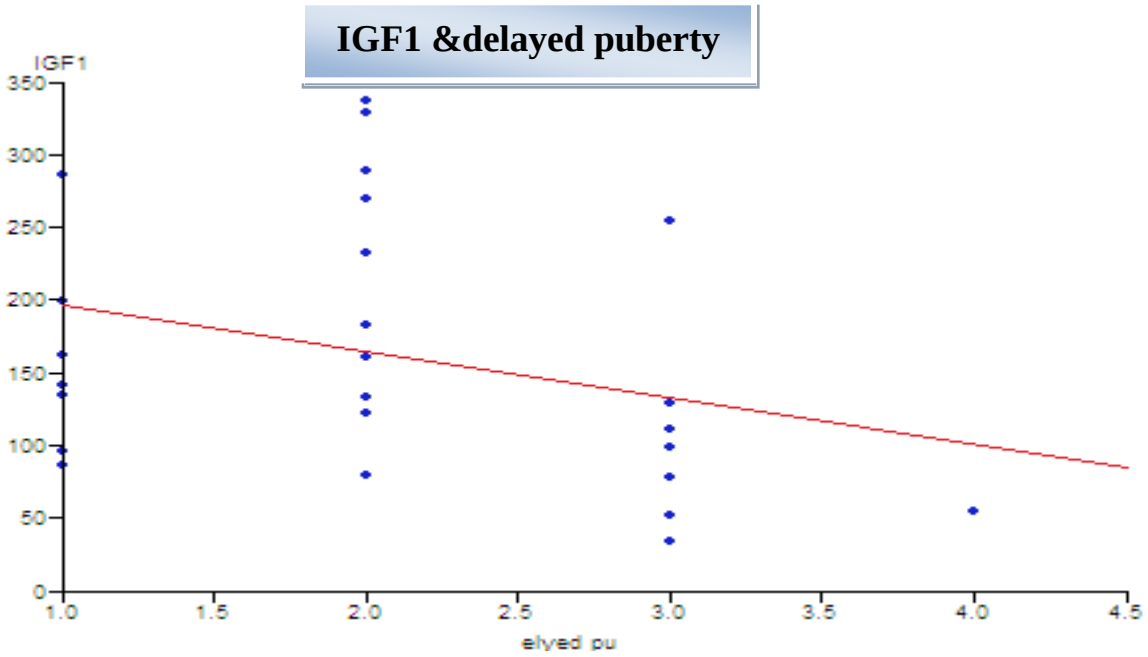

Figure 12f: Correlation between IGF1 and delayed puberty.

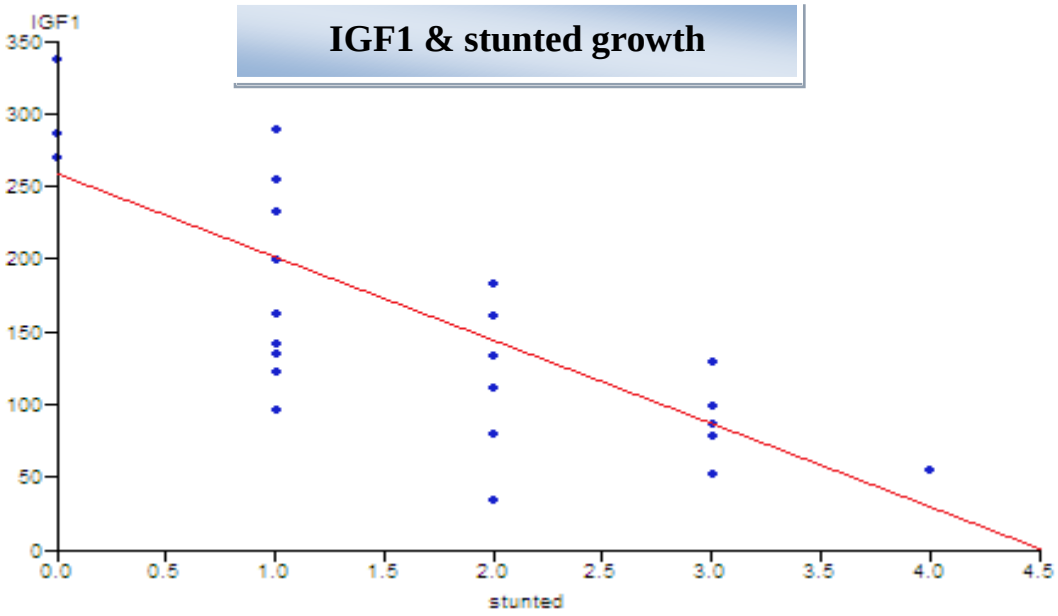

Figure 12g: Correlation between IGF1 and stunted growth.

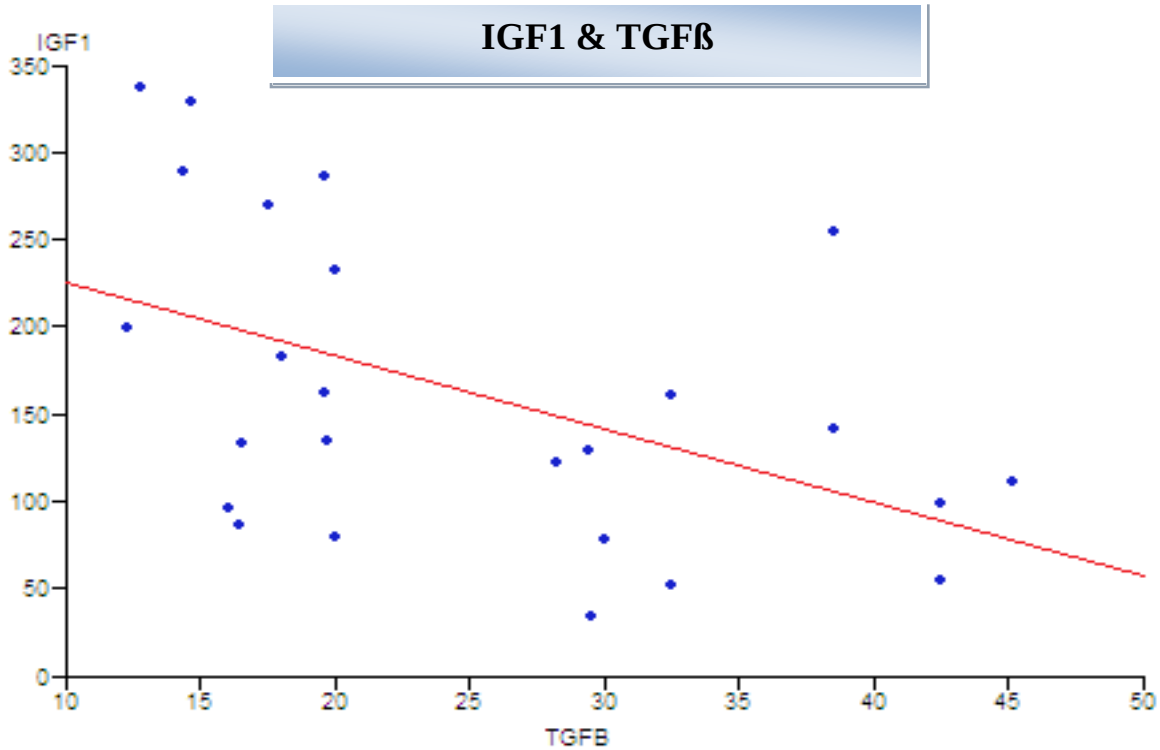

Figure 12a: Correlation between IGF1 and TGFβ

Table (13): school performance in studied groups

	Cases		Control		Z	P
	NO	**%**	**NO**	**%**		
School performance Poor	8	32	2	8	2.1	<0.05*
Average	17	68	23	92		
Total	25	100	25	100		

Table (13): shows significant difference between cases and control as regard school performance.

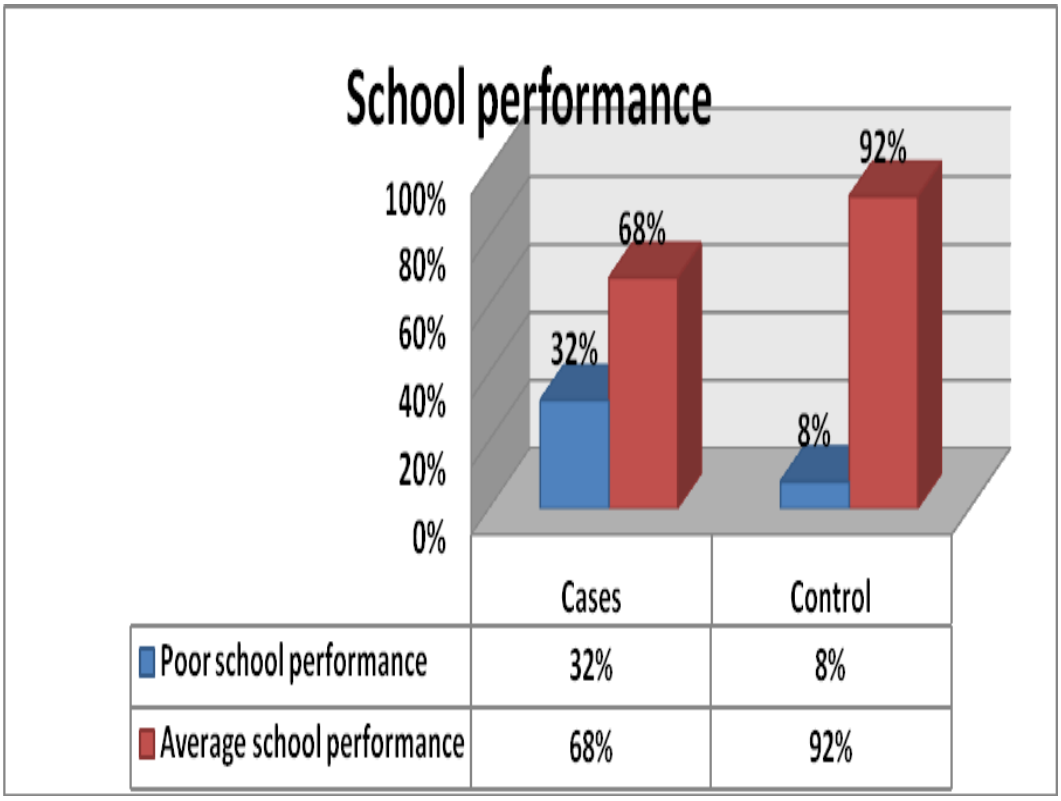

Figure 13: School performance in studied groups

Table (14): Comparison of studied groups regarding depression score.

	Cases		Control		Z	P
	NO	%	NO	%		
No depression						
male	8	32	10	40	0.58	>0.05
female	2	8	14	56	3.6	<0.001**
MILD						
male	3	12	1	4	2.7	<0.01**
female	6	24	0	0	2.6	<0.01**
MOD						
male	2	8	0	0	1.4	>0.05
female	4	16	0	0	2	<0.05*
Total	25	100	25	100		

Table (14): shows higher incidence of depression among studied cases especially in females

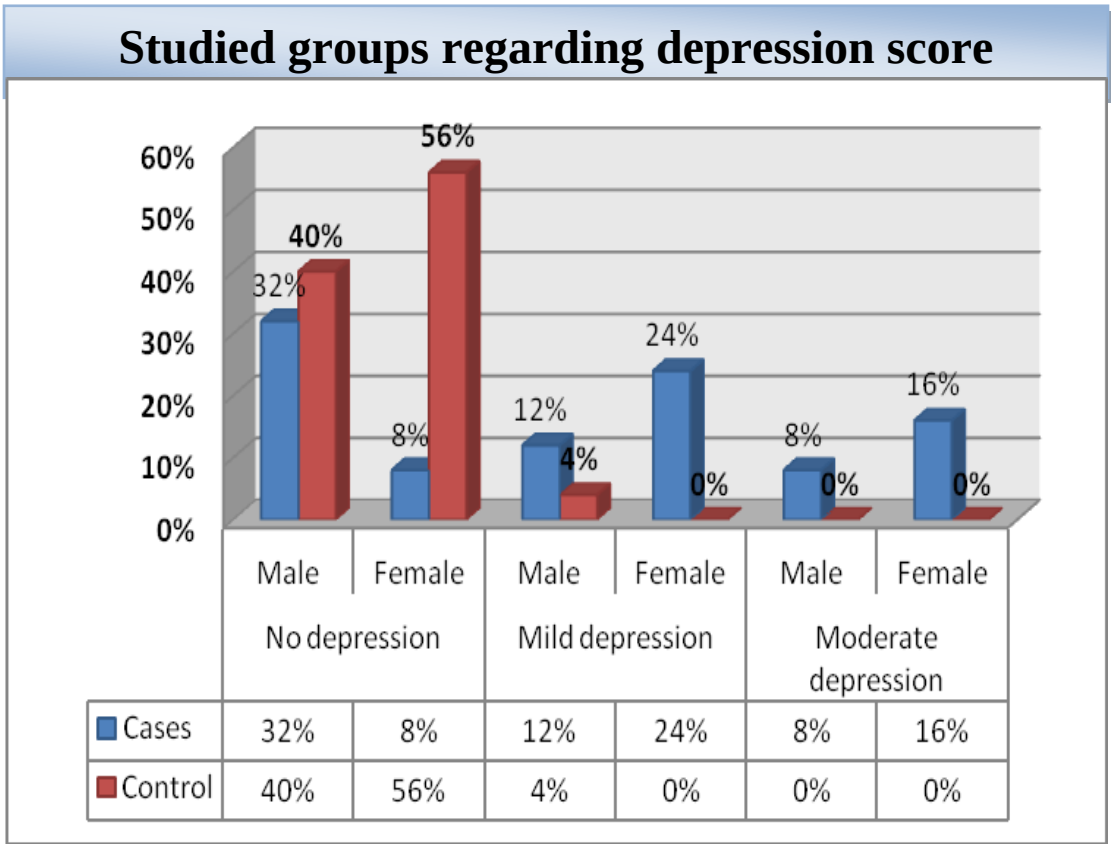

Figure 14: Prevalence of depression among studied groups as regard sex

Table (15): Correlation between depression and other parameters

	r	P
Age	0.1332	>0.05
Duration	0.4512	<0.05*
Serum albumin	- 0.2776	>0.05
ALT	0.1349	>0.05
AST	0.1600	>0.05
T.S.B.	0.2293	>0.05
Delayed puberty	0.0930	>0.05
Stunting	0.4262	<0.05*
IGF1	0.0657	>0.05
TGFβ	0.0207	>0.05
School performance	- 0.5652	<0.01**

Table (15) Shows a significant positive correlation with duration of illness, and Stunting and negative correlation with school performance.

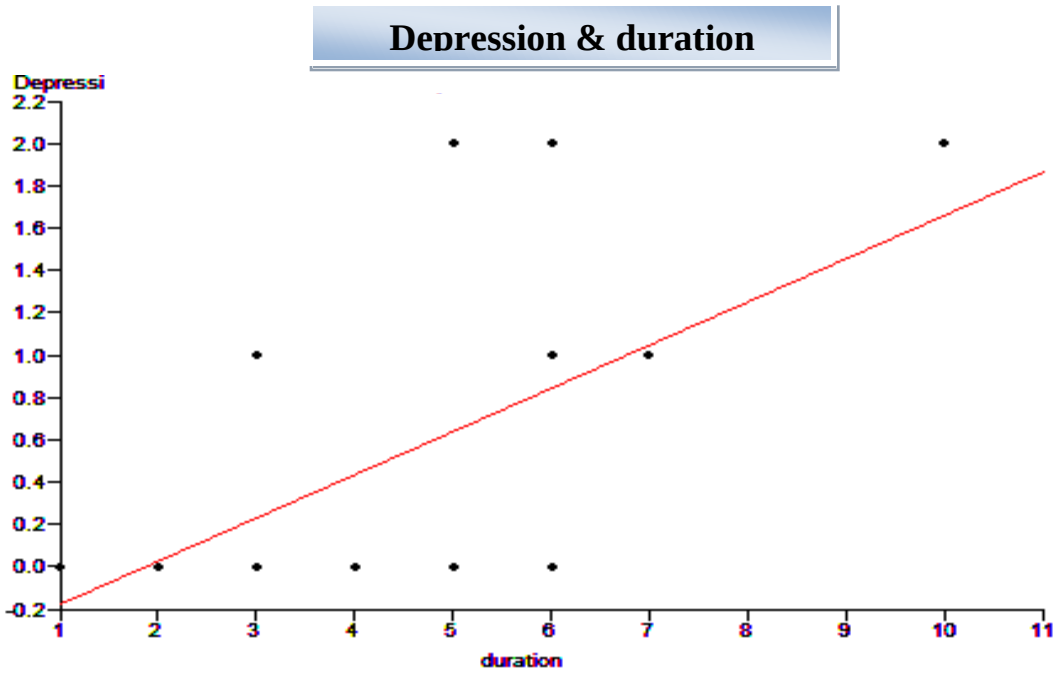

Figure 15a: Correlation between depression and duration

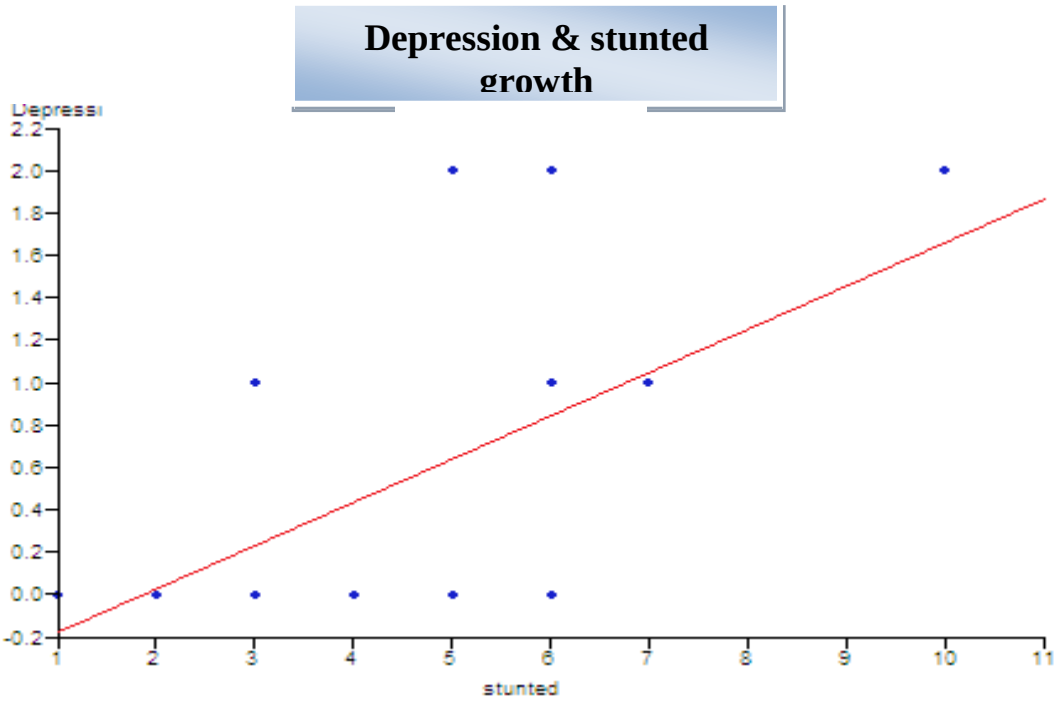

Figure 15b: Correlation between depression and stunted growth

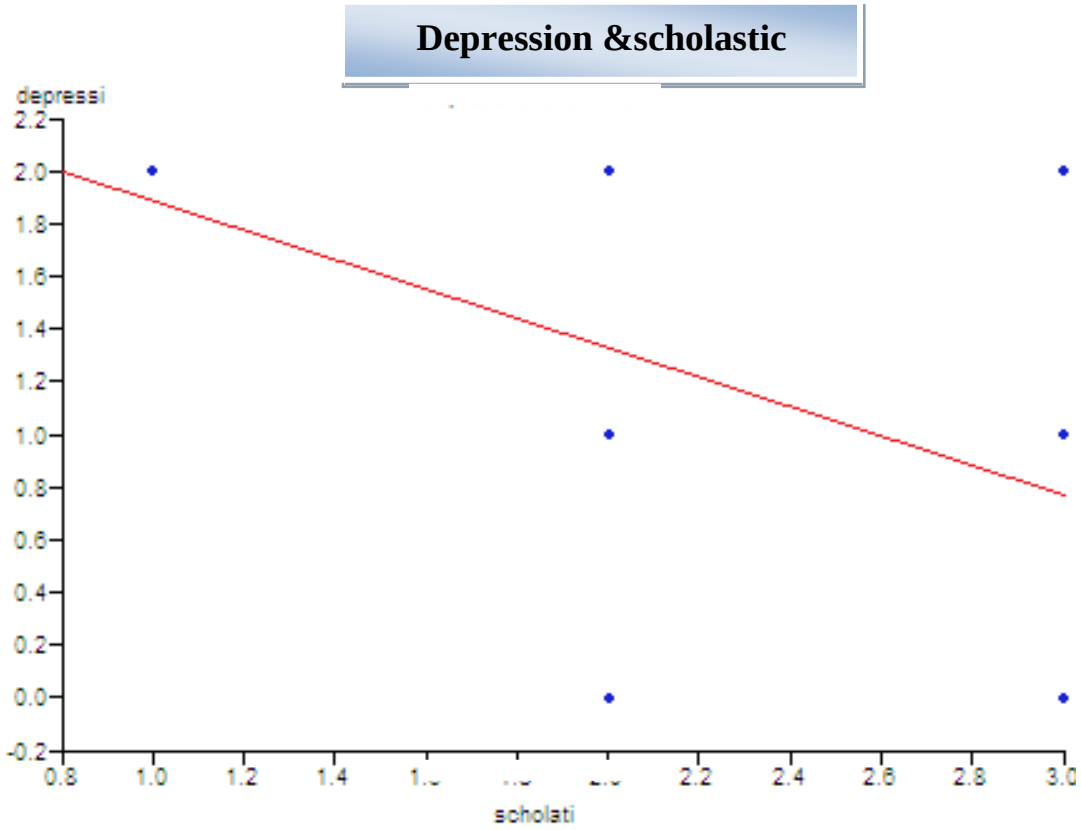

Figure 15c: Correlation between depression and scholastic achievement.