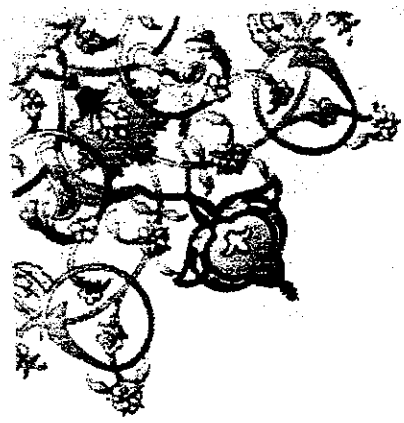

RESULTS

RESULTS

The results of the current study are shown in the following tables :

Table (1) shows the age and gender distribution in the studied groups where the mean age was 33.14±10.06 years in the control group, 56.30±8.85 years in HCC group, 50.35± 11.18 in liver cirrhosis group and 45.70±8.48 years in chronic hepatitis group. Regarding gender, there were 21.4%, 65%, 75%, 70% males and 78.6%, 35%, 25% and 30% females in the control, HCC, liver cirrhosis and chronic hepatitis groups respectively.

1) C.B.C.:

Table (2a) demonstrate the RBCs number in million/cc^3 in the control and other work groups:

- In the control group it was 4.6 ± 0.3.
- In the HCC group it was 3.3 ± 0.4 which was significantly ($P<0.001$) lower than that of the control group.

- In the cirrhosis group it was 3.5 ± 0.7 which was significantly (P<0.001) lower than that of the control group but insignificantly (P>0.05) variable from that of HCC.

- In the chronic hepatitis group it was 3.2 ± 0.5 which was significantly (P<0.001) lower than that of the control group but insignificantly (P>0.05) changed when compared to the HCC and cirrhosis groups.

Concerning the WBCs count in the various studied groups, it was expressed in thousands/cc^3 (Table 2b):

- In the control group it was 5200 ± 1131.7.

- In the HCC group it was 4930 ± 1545.6 which was insignificantly (P>0.05) changed when compared to the control value.

- In the cirrhosis group it was 5485 ± 1590 which was insignificantly (P>0.05) variable from either the control and HCC group.

- In the chronic hepatitis group it was 4720 ± 1955 which was insignificantly (P>0.05) different from all other groups.

As regard the platelet count, it was expressed in thousands/cc^3 as follows (Table 2c):

- In the control group it was 281 ± 42.9.
- In the HCC group it was 179.7 ± 90.2 which was significantly (P<0.001) reduced when compared to the control value.
- In the cirrhosis group it was 143.3 ± 76.7 which was also significantly (P<0.001) reduced when compared to the control value but insignificantly (P>0.05) variable from HCC value.
- In the chronic hepatitis group it was 174.9 ± 72.7 which was significantly (P<0.001) lower than that of the control value but significantly indifferent (P>0.05) from that in all other groups.

2) Prothrombine Time (sec.):

Table (3) illustrate prothrombin time in control and other groups:

- In the control group it was 12.7 ± 1.7 seconds.

- In the HCC group it was 15.3 ± 3.2 seconds which was significantly (P<0.05) higher than that of the control group.
- In the cirrhosis group: it was 19.1 ± 4.6 seconds which was significantly (P<0.001) higher than that of the control and also significantly (P<0.05) higher than the HCC group.
- In the chronic hepatitis group it was 15.7 ± 2.8 which was significantly (P<0.01) higher than that of the control group, significantly (P<0.01) lower than that of the cirrhosis group but insignificantly (P>0.05) variable from the HCC group.

3) ***Total and Direct Bilirubin (mg/dL):***

Table (4) demonstrates serum total and direct bilirubin in the control and other diseased group:

- In the control group the total bilirubin was 0.7 ± 0.19 mg/dL while the direct level was 0.13 ± 0.04 mg/dl.
- In the HCC group the total serum bilirubin was 3.4 ± 1.6 mg/dL which was significantly (P<0.001) higher than the control value. The direct bilirubin level was 2.2 ± 1.01 mg/dL which was also significantly (P<0.001) elevated than the corresponding control value.

- In the cirrhosis group the total serum bilirubin was 3 ± 1.9 mg/dL which was significantly (P<0.001) higher than that of the control group but insignificantly (P>0.05) changed from the corresponding HCC level. The direct bilirubin level was 1.8 ± 1.4 mg/dL which was significantly (P<0.001) higher than the corresponding control value but also statistically indifferent (P>0.05) from that of the HCC group.

- In the chronic hepatitis group the total serum bilirubin was 2.1 ± 1.1 mg/dL which was significantly (P<0.001) higher than the control value, significantly (P<0.01) lower than the HCC level but insignificantly (P>0.05) variable from the cirrhosis group. The direct bilirubin level was 1.2 ± 0.9 mg/dL which was significantly (P<0.001) elevated when compared to the control value, significantly (P<0.01) reduced when compared to the HCC level but insignificantly (P>0.05) changed when compared to the cirrhosis group.

4) ALT Level (IU/L):

Table (5) and illustrate ALT level in the various groups of this study:

- In the control group it was 25.1 ± 6.6 IU/L.

- In the HCC group it was 77.7 ± 9.5 IU/L which was significantly (P<0.001) elevated when compared to the control value.
- In the cirrhosis group it was 94.9 ± 14.6 IU/L which was significantly (P<0.001) higher than the control and the HCC values.
- In the chronic hepatitis group it was 66.15 ± 11.1 IU/L which was significantly (P<0.001) elevated than the control value but significantly (P<0.01 & <0.001) lower than the HCC and cirrhosis groups' levels.

5) AST Level (IU/L):

Table (6) show AST level in the control and other work groups:

- In the control group it was 23.5 ± 7 IU/L.
- In the HCC group it was 93.7 ± 16.1 IU/L which was significantly (P<0.001) elevated when compared to that of the control group.
- In the cirrhosis group it was 90.2 ± 17.5 IU/L which was significantly (P<0.001) elevated than the control value but significantly (P>0.05) invariable from that of HCC group.

- In the chronic hepatitis group it was 104.7 ± 25.3 IU/L which was significantly ($P<0.001$) higher than the control value but insignificantly ($P>0.05$) changed from HCC and cirrhosis groups' values.

6) *Serum Albumin Level: (g/L)*

Table (7) show serum albumin level in the control and other work groups:

- In the control group it was 4.1 ± 0.2 g/L.
- In the HCC group it was 2.7 ± 0.6 g/L which was significantly ($P<0.001$) reduced when compared to the control value.
- In the cirrhosis group it was 2.04 ± 0.4 g/L which was also significantly ($P<0.001$) reduced when compared to either the control and HCC levels.
- In chronic hepatitis group it was 2.8 ± 0.4 g/L which was significantly ($P<0.001$) reduced when compared to the control value, statistically invariable ($P>0.05$) when compared to HCC group but significantly ($P<0.001$) higher than that of the cirrhosis group.

7) *Total Plasma Protein Level: (g/L)*

Table (8) and show total plasma protein level in the control and other work groups:

- In the control group it was 7.1 ± 0.2 g/L.
- In the HCC group it was 6.5 ± 0.4 g/L which was significantly (P<0.001) reduced when compared to the control value.
- In the cirrhosis group it was 5.7 ± 0.7 g/L which was significantly (P<0.001) reduced when compared to either the control or the HCC level.
- In the chronic hepatitis group it was 6.1 ± 0.7 g/L which was significantly (P<0.001 & <0.05) lower than that of the control and HCC values but insignificantly (P>0.05) changes when compared to that of cirrhosis group.

8) Serum Alkaline Phosphatase Level (IU/L):

Table (9) illustrate serum alkaline phosphatase level in the control and other groups:

- In the control group it was 58.5 ± 5.3 IU/L.
- In the HCC group it was 400 ± 86.5 IU/L which was significantly (P<0.001) higher than that of the control group.
- In the cirrhosis group it was 152.1 ± 27.9 IU/L which was significantly (P<0.001) higher than the control value but lower than the HCC group's level.

- In the chronic hepatitis group it was 119 ± 28.9 IU/L which was significantly (P<0.001) higher than that of the control but significantly (P<0.001) lower than that of either the HCC and cirrhosis groups.

9) Serum γ-Glutamyl Transpeptidase Level (U/L):

Table (10) illustrate serum γGT level in the control and other liver disease groups:

- In the control group it was 28.5 ± 4.2. U/L.
- In the HCC group it was 186.8 ± 51.2 U/L which was significantly (P<0.001) elevated when compared to the control value.
- In the cirrhosis group it was 87.4 ± 21.5 U/L which was significantly (P<0.001) higher than the control but lower than the HCC values.
- In the chronic hepatitis group it was 103.2 ± 29.04 U/L which was significantly (P<0.001) higher than that of the control but lower than the HCC group levels. However it was significantly (P>0.05) comparable to that of cirrhosis group value.

10) Anti-HCV and HBsAg:

Tables (11 & 12) illustrate the (%) ratio of anti-HCV and HBsAg in the work group:

- In the HCC group, 70% of cases were HCV positive while 15% were HBsAg positive.
- In the cirrhosis group, 70% of cases were also HCV positive but 25% were HBsAg positive.
- In the chronic hepatitis group, 80% of cases were HCV positive, meanwhile, 50% of cases were HBsAg positive.

11) Serum α–Fetoprotein Level: (μg/L)

Table (13) illustrate serum α-fetoprotein level in the control and diseased groups:

- In the control group, it was 537.1 ± 144.9 μg/L which was significantly (P<0.001) higher than that of the control group.
- In the cirrhosis group it was 128.8 ± 36.8 μg/L which was significantly (P<0.001) elevated when compared to the control value but significantly (P<0.001) lower than the HCC group.
- In the chronic hepatitis group it was 5.6 ± 2.4 μg/L which was significantly (P<0.05) higher than that of the control but significantly (P<0.001) reduced when compared to the HCC and cirrhosis group.

12) *Serum IgG and IgM Level (mg/dL):*

Table (14) illustrate levels of serum IgG in various control and test groups:

- In the control group it was 1242.6 ± 139.5 mg/dL.
- In the HCC group it was 2832.1 ± 507 mg/dL which was significantly (P<0.001) higher than that of the control group.
- In the cirrhosis group it was 27.47.3 ± 573.5 mg/dL which was significantly (P<0.001) higher than the control value but insignificantly (P>0.05) changed from the HCC value.
- In chronic hepatitis it was 2592.8 ± 540.1 mg/dL which was significantly (P<0.001) higher than that of the control value but significantly (P>0.05) comparable to those of HCC and cirrhosis groups.

Table (15) illustrate serum IgM levels in control and other groups:

- In the control it was 112.1 ± 30 mg/dL.
- In the HCC group it was 187.4 ± 26 mg/dL which was significantly (P<0.001) higher than that of the control group.

- In the cirrhosis group it was 229.8 ± 59 mg/dL which was significantly (P<0.001 & <0.01) higher than either of the control and HCC groups.
- In the chronic hepatitis group it was 175.5 ± 45 mg/dL which was significantly (P<0.001) higher than that of the control group, significantly (P>0.05) comparable to that of the HCC group but significantly (P<0.01) lower than that of the cirrhosis group.

13) Serum TGF-α Level: (pg/mL)

Table (16) illustrate serum TGF-α in various control and liver disease groups:

- In the control group it was 21.1 ± 5.5 pg/mL.
- In the HCC group it was 50.6 ± 8.6 pg/mL which was significantly (P<0.001) higher than that of the control group.
- In the cirrhosis group it was 23.7 ± 8.1 pg/mL which was statistically insignificant (P>0.05) comparable to that of the control group but significantly (P<0.001) lower than that of HCC group.
- In the chronic hepatitis group it was 19 ± 5.1 pg/mL which was statistically insignificant (P>0.05) comparable to that of the control group but significantly

($P<0.001$ & <0.05) when compared to HCC and cirrhosis groups.

Correlation between TGF-α and Each of other Liver Function Tests:

Tables (17, 18 & 19) illustrate the correlation between TGF-α and each of other liver function tests in the HCC, cirrhosis and chronic hepatitis groups.

They show positive significant correlation with IgG in HCC group ($r= 0.555$ & $P<0.05$) and with either of P.T. ($r= 0.443$ & $P<0.05$) and α-fetoprotein ($r= 0.447$ & $P<0.05$) in the cirrhotic group. In chronic hepatitis group no significant correlation was found between TGF-α and other liver function tests.

Sensitivity and Specificity :

Table (20) shows the different sensitivites and corresponding cut-off values and diagnostic accuracies for AFP for detection of hepatocellular carcinoma as compared with cirrhotic patients. The best cut-off value for AFP is 176 µg/L at sensetivity and specificity of 90%, 90% respectively.

Table (21) shows the different sensitivites and corresponding cut-off values and diagnostic accuracies for TGF-alpha for detection of hepatocellular carcinoma as compared with cirrhotic patients. The best cut off cut-off value is 30 pg/mL for TGF-alpha at sensetivity and specificity of 75%, 70% respectively.

The Receiver Operating Characteristic Curve :

The receiver operating characteristic curve (ROC curve) was used to compare and evaluate the best cut-off values, sensitivity, specificity, and the accuracy of the levels of serum AFP and TGF-alpha for detection of HCC in patients with chronic liver diseases.

It was found that the best cut off vlue for serum AFP was 176 µg/L and for TGF-alpha was 30 pg/ml which are the points closest the upper left corner of the curve.

The ROC curve is also used to compare the two diagnostic tests. The curve nearer to the upper left pole is the one which has the greater sensitivity and specificity and hence the more accurate of the two. Moreover, the area under the curve represents the overall accuracy of each test. The larger this area, the better the test. These two factors fit with the AFP curve which is better than TGF-alpha in diagnosis of hepatocellular carcinoma.

To Be discussed later

Table (1): Age and gender in the studied groups.

	Controls (n=21)	HCC (n=20)	Cirrhosis (n=20)	Chronic Hepatitis (n=20)
Age (yrs)				
Mean	33.14	56.30	50.35	45.70
±SD	10.06	8.85	11.18	8.48
Gender	No. %	No. %	No. %	No. %
Male	15 71.4	13 63	15 75	14 70
Female	6 28.6	7 35	6 25	6 30
Total	21 100	20 100	21 100	20 100

Table (2a): C.B.C.; RBCs (million/cc^3) in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	4.6	3.3	3.5	3.2
± SD	0.3	0.4	0.7	0.5
P_1		4.5 < 0.001	4.5 < 0.001	5 < 0.001
P_2			0.000 > 0.05	0.52 > 0.05
P_3				0.52 > 0.05

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

Table (2b): C.B.C.; WBCs /cc^3 in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	5200	4930	5485	4720
± SD	1131.7	1545.6	1590	1955
P_1		0.296 > 0.05	1.53 > 0.05	0.154 > 0.05
P_2			1.09 > 0.05	0.367 > 0.05
P_3				1.32 > 0.05

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

Table (2c): C.B.C.; Platelets /cc^3 in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	281	179.7	143.3	174.9
± SD	42.9	90.2	76.7	72.7
P_1		4.46 < 0.001	6.86 < 0.001	5.46 < 0.001
P_2			1.33 > 0.05	0.25 > 0.05
P_3				1.27 > 0.05

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

Table (3): Illustrates the prothrombin time (seconds) in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	12.7	15.3	19.1	15.7
± SD	1.7	3.2	4.6	2.8
P_1		2.3 < 0.05	4.9 < 0.001	2.83 < 0.01
P_2				0.44 > 0.05
P_3				2.8 < 0.01

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

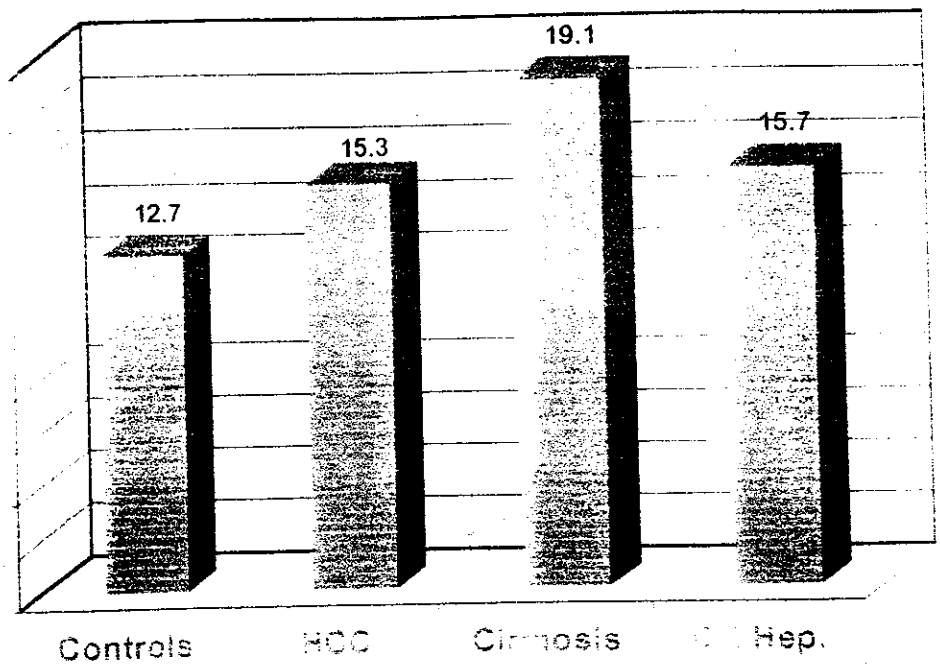

Fig. (2): Prothrombin time in the studied groups

Table (4): Total and direct bilirubin (mg/dL) in control and various liver disease groups.

	Controls		HCC		Cirrhosis		Ch. Hep.	
	Total	Direct	Total	Direct	Total	Direct	Total	Direct
Mean	0.7	0.13	3.4	2.2	3.01	1.8	2.1	1.2
± SD	0.19	0.04	1.6	1.01	1.9	1.4	1.1	0.9
P_1			7.5 <0.001	4.4 <0.001	5.34 <0.001	5.21 <0.001	5.46 <0.001	5.19 <0.001
P_2					0.702 >0.05	1.02 >0.05	2.95 <0.01	3.33 <0.01
P_3							1.8 >0.05	1.57 >0.05

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

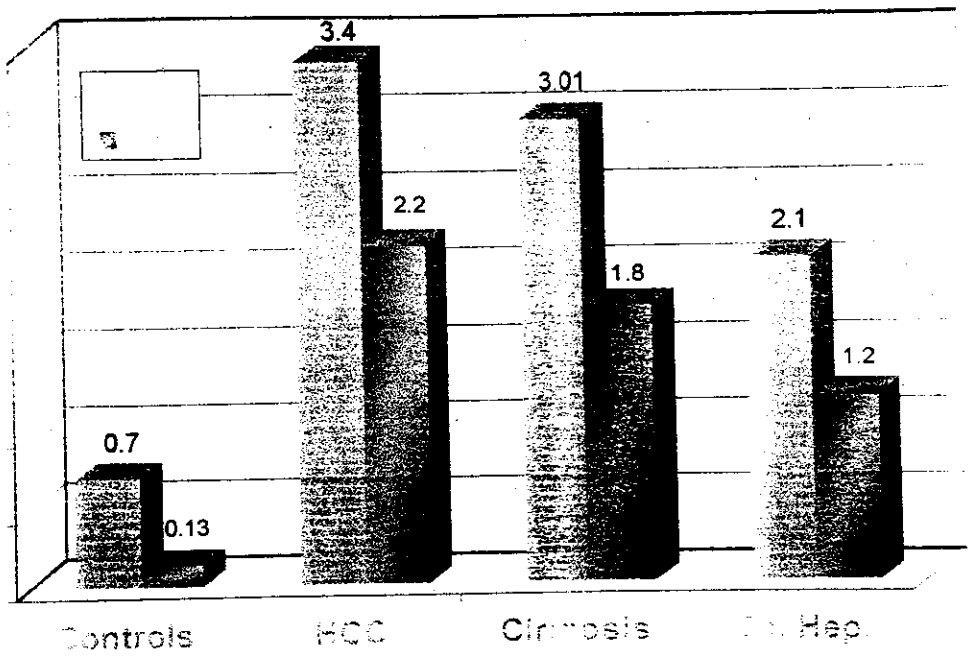

Fig. (3): Total and direct bilirubin in the studied groups

Table (5): Illustrates ALT (IU/L) level in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	25.1	77.7	94.9	66.15
± SD	6.6	9.5	14.6	11.1
P_1		19.8 < 0.001	19.3 < 0.001	14.1 < 0.001
P_2			4.3 < 0.001	3.33 < 0.01
P_3				6.86 < 0.001

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

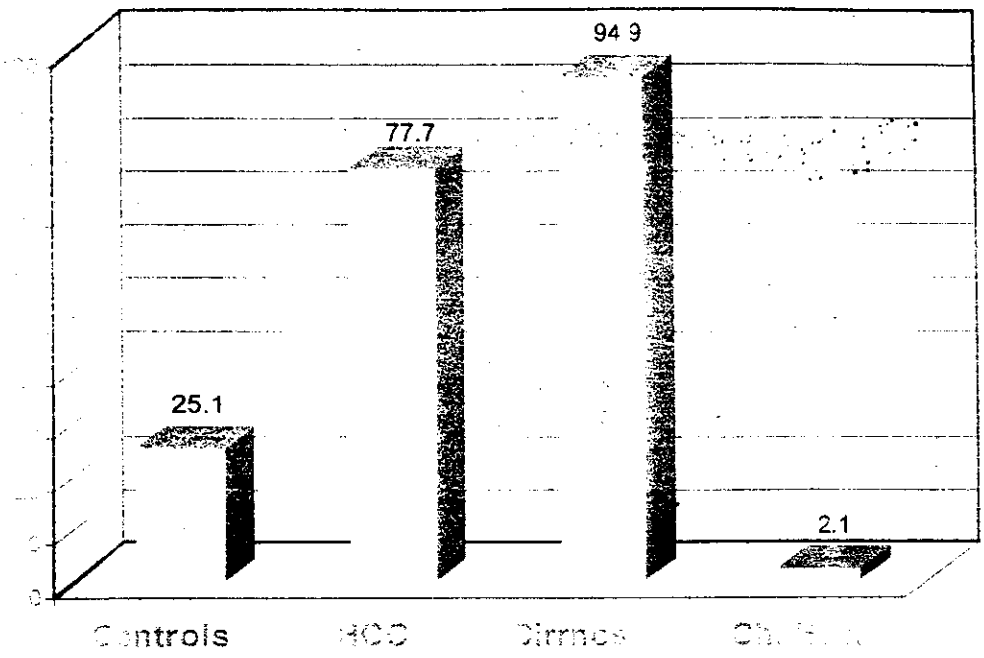

Fig. (4): ALT in the studied groups

Table (6): Demonstrates AST (IU/L) level in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	23.5	93.7	90.2	104.7
± SD	7	16.1	17.5	25.3
P_1		17.5 < 0.001	15.9 < 0.001	13.7 < 0.001
P_2			0.64 > 0.05	1.61 > 0.05
P_3				1.92 > 0.05

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

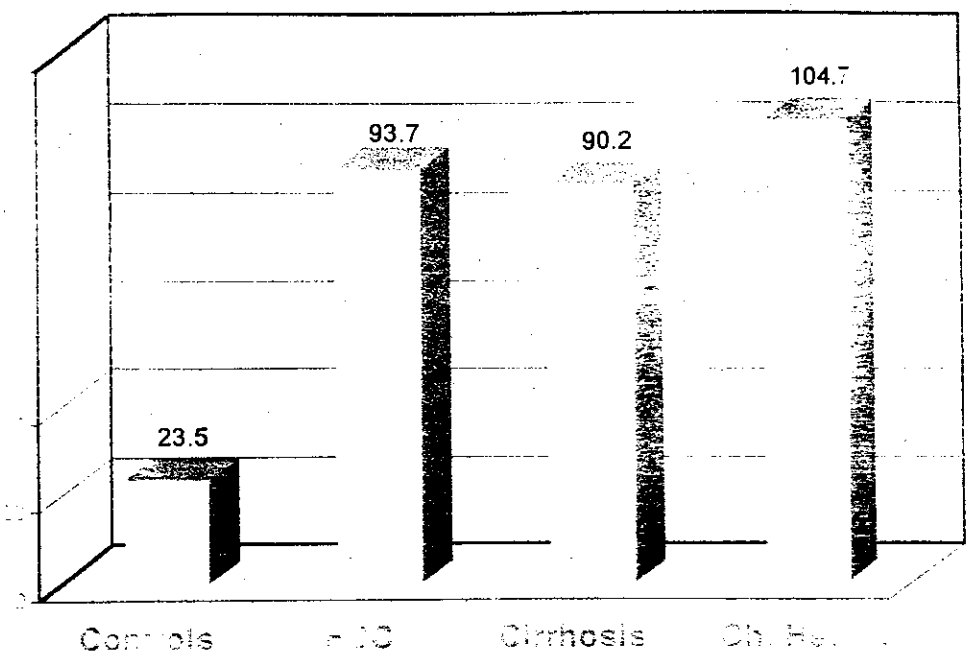

Fig. (5): AST in the studied groups

Table (7): Demonstrates serum albumin level (g/dL) in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	4.1	2.7	2.04	2.8
± SD	0.2	0.6	0.4	0.4
P_1		10 < 0.001	20.6 < 0.001	13 < 0.001
P_2			4.12 < 0.001	0.625 > 0.05
P_3				6.33 < 0.001

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

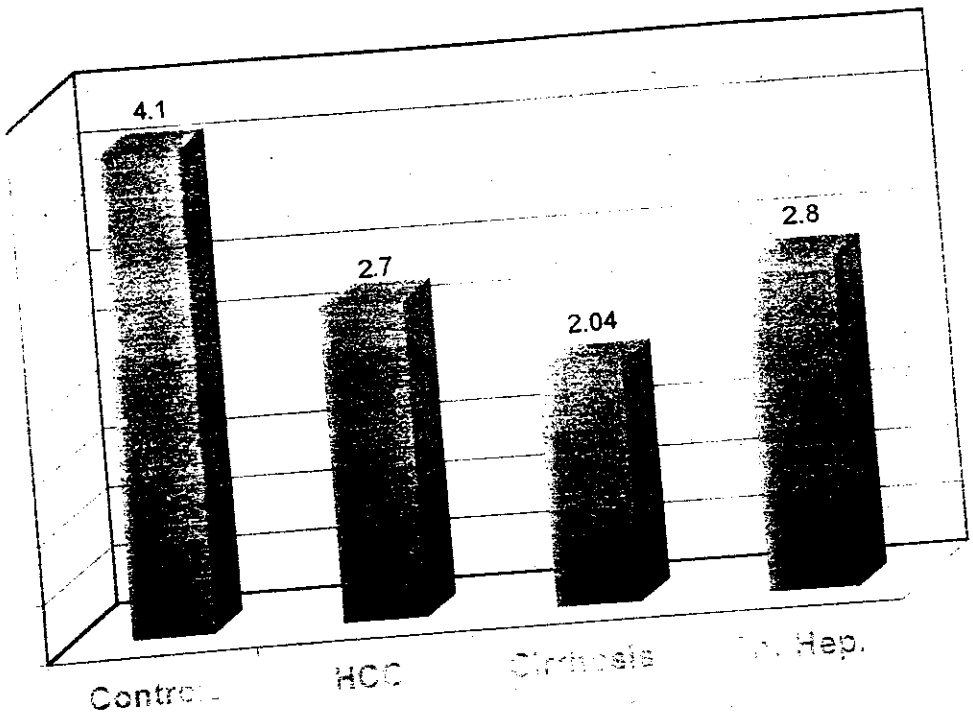

Fig. (6): S. albumin in studied groups

Table (8): Demonstrates total plasma protein level (g/dL) in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	7.1	6.5	5.7	6.1
± SD	0.2	0.4	0.7	0.7
P_1		6 < 0.001	8.75 < 0.001	6.25 < 0.001
P_2			4.2 < 0.001	2.2 < 0.05
P_3				1.81 > 0.05

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

Table (9): Demonstrates serum alkaline phosphatase (IU/L) level in control and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	58.5	400	152.1	119
± SD	5.3	86.5	27.9	28.9
P_1		17.3 < 0.001	14.4 < 0.001	9.1 < 0.001
P_2			11.9 < 0.001	13.38 < 0.001
P_3				3.58 < 0.001

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

Table (10): Demonstrates serum GGT level (U/L) in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	28.5	186.8	87.4	103.2
± SD	4.2	51.2	21.5	29.04
P_1		13.5 < 0.001	11.8 < 0.001	11.1 < 0.001
P_2			7.85 < 0.001	6.19 < 0.001
P_3				1.951 > 0.05

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

Table (11): Demonstrates percentage ratio of anti-HCV positive cases in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Number	0.00	14/20	14/20	16/20
Ratio (%)	0.00%	70%	70%	80%

Table (12): Demonstrates percentage ratio of HBsAg positive cases in control group and various liver disease group.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Number	0.00	3/20	5/20	10/20
Ratio (%)	0.00%	15%	25%	50%

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

Table (13): Demonstrates serum α-fetoprotein level (μg/L) in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	4.1	537.1	128.8	5.6
± SD	1.2	144.9	36.8	2.4
P_1		16.05 < 0.001	14.7 < 0.001	2.45 < 0.05
P_2			11.9 < 0.001	11.3 < 0.001
P_3				15 < 0.001

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

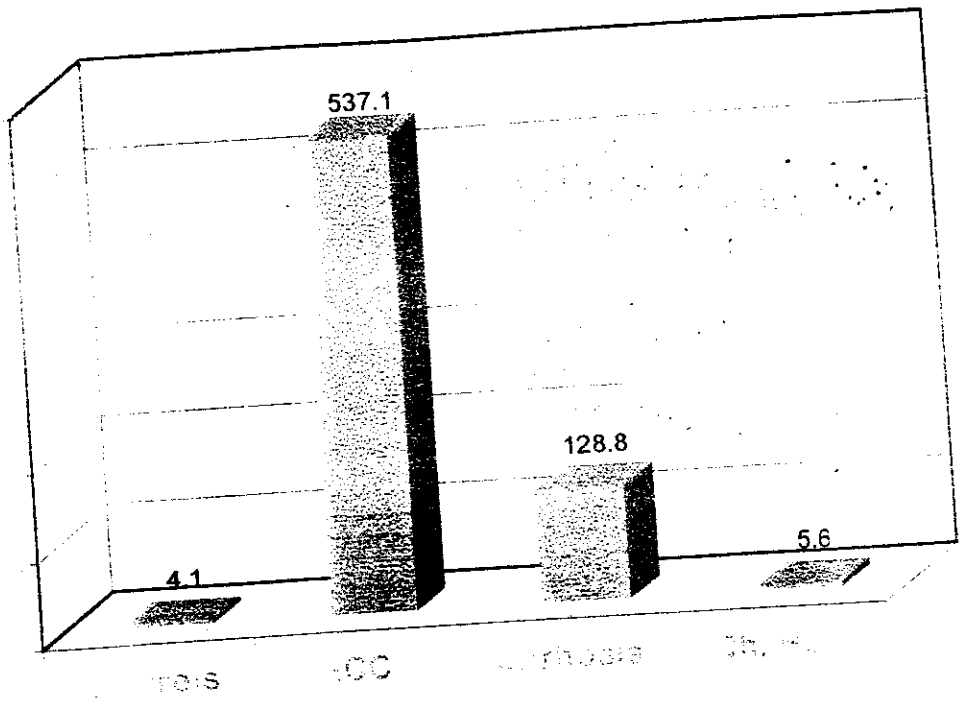

Fig. (7): α-fetoprotein in studied groups

Table (14): Demonstrates serum IgG level (mg/dL) in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	1242.6	2832.1	2747.3	2592.8
± SD	139.5	507	573.5	540.1
P_1		13.25 < 0.001	11.14 < 0.001	10.62 < 0.001
P_2			0.428 > 0.05	1.42 > 0.05
P_3				0.861 > 0.005

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

Table (15): Demonstrates serum IgM level (mg/dL) in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean ±SD	112.1 30	187.4 26	229.8 59	175.5 45
P_1		8.24 < 0.001	7.74 < 0.001	5.08 < 0.001
P_2			2.85 < 0.01	1.008 > 0.05
P_3				3.17 < 0.01

P_1 : Compared to the control group.

P_2 : Compared to the HCC group.

P_3 : Compared to the cirrhosis group.

Table (16): Demonstrates serum TGF-α level (pg/ml) in control group and various liver disease groups.

	Controls	HCC	Cirrhosis	Chronic Hepatitis
Mean	21.1	50.6	23.7	19
± SD	5.5	8.6	8.1	5.1
P_1		12.3 < 0.001	1.18 > 0.05	1.23 > 0.05
P_2			10.3 < 0.001	14.09 < 0.001
P_3				2.23 < 0.05

P_1: Compared to the control group.

P_2: Compared to the HCC group.

P_3: Compared to the cirrhosis group.

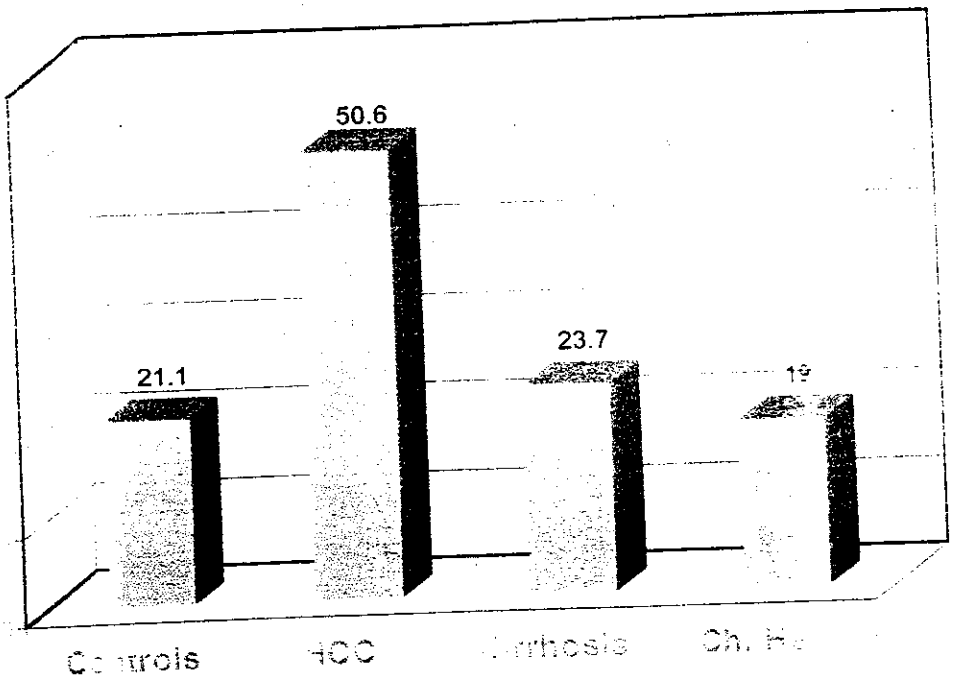

Fig. (8): TGF-α in studied groups

Table (17): Correlation between TGF-α (pg/ml) and each of liver function tests in HCC group.

Liver Function Tests	r	P
Prothrombin Time	0.333	N.S
Serum total bilirubin	0.221	N.S
ALT	0.128	N.S
AST	0.148	N.S
Albumin	– 0.134	N.S
Total Protein	0.003	N.S
Alkaline Phosphatase	– 0.399	N.S
GGT	0.013	N.S
Alpha-fetoprotein	0.283	N.S
IgG	0.555	S. < 0.05
IgM	0.039	N.S

Table (18): Correlation between TGF-α (pg/ml) and each of liver function tests in Cirrhotic group.

Liver Function Tests	r	P
Prothrombin Time	– 0.025	N.S
Serum total bilirubin	0.239	N.S
ALT	0.443	S. < 0.05
AST	0.166	N.S
Albumin	– 0.105	N.S
Total Protein	0.223	N.S
Alkaline Phosphatase	– 0.371	N.S
GGT	– 0.101	N.S
Alpha-fetoprotein	0.447	S. < 0.05
IgG	0.229	N.S
IgM	0.231	N.S

Table (19): Correlation between TGF-α (pg/ml) and each of liver function tests in chronic hepatitis group.

Liver Function Tests	r	P
Prothrombin Time	0.115	N.S
Serum total bilirubin	– 0.276	N.S
ALT	0.115	N.S
AST	0.101	N.S
Albumin	0.18	N.S
Total Protein	0.05	N.S
Alkaline Phosphatase	0.047	N.S
GGT	0.049	N.S
Alpha-fetoprotein	0.009	N.S
IgG	– 0.111	N.S
IgM	– 0.179	N.S

Table (20): Sensitivity, specificity, and accuracy of AFP (µg/L) in diagnosis of HCC at different cut-off levels.

Level (µg/ml)	Sensitivity %	Specificity %	Accuracy %
126	100	40	70
130	100	45	72.5
140	100	60	80
160	95	70	82.5
161	92.5	80	86.25
176*	90	90	90
181	87.5	95	91.25
190	85	100	92.25

* Best cut-off level

This table shows the different sensitivites, specificities and diagnostic accuracies at different cut-off levels of serum AFP for detection of hepatocellular carcinoma as compared with cirrhotic patients. The best cutoff level for AFP is 176 ng/ml.

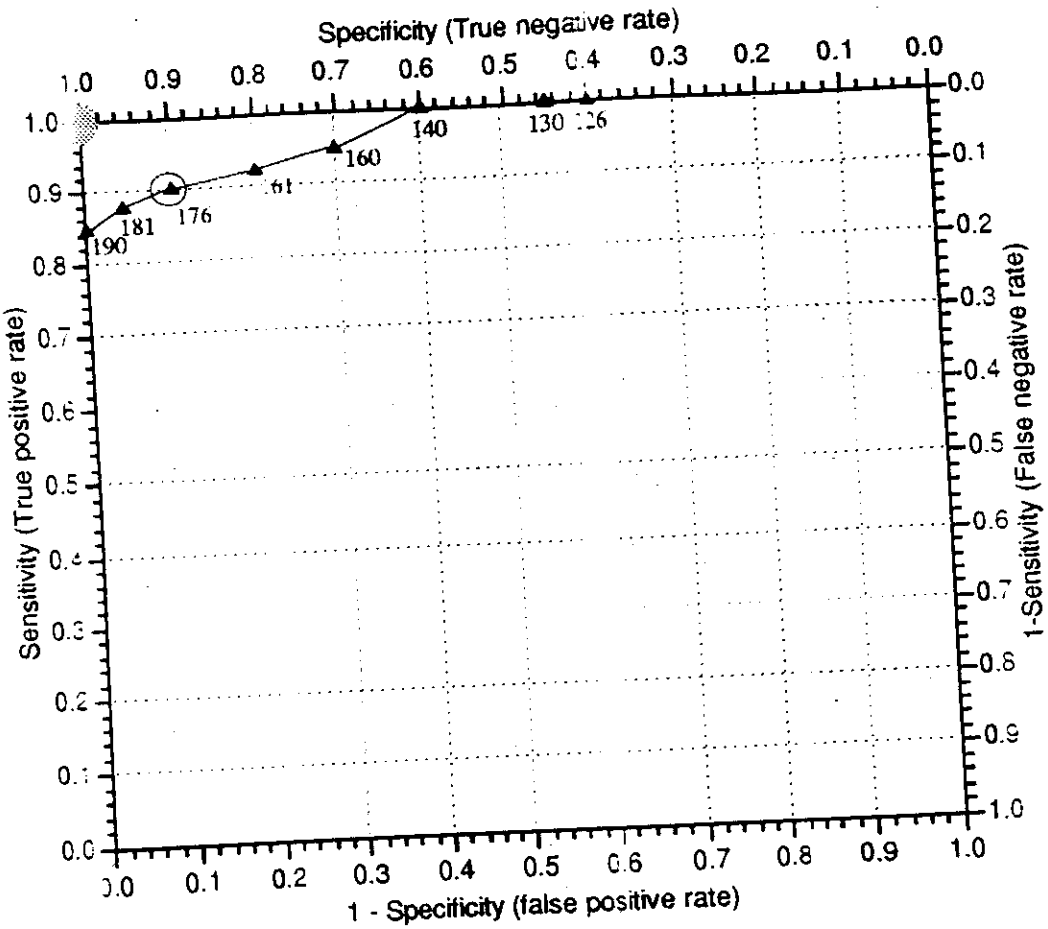

Fig. (11): Receiver Operator Characteristic Curve (ROC curve) for serum AFP levels in HCC group.

The best cut off level for serum AFP is 176 µg/L (circle). A point closest to the upper left corner (shadowed circle) where both sensitivity and specificity are ideal (100%).

Table (21): Sensitivity, specificity, and accuracy of TGF-alpha (pg/ml) in diagnosis of HCC at different cut-off levels.

Level (ng/ml)	Sensitivity %	Specificity %	Accuracy %
20	87.5	40	63.75
25	82.00	45	63.50
28	77.5	60	68.25
30*	75	70	72.50
31	65	80	72.5
33	65	90	72.5
39	52.5	95	73.75
40	50	100	75

* Best cut-off level

This table shows the different sensitivites, specificities and diagnostic accuracies at different cut-off levels of serum TGF-alpha for detection of hepatocellular carcinoma as compared with cirrhotic patients. The best cutoff level for TGF-alpha is 30 pg/ml.

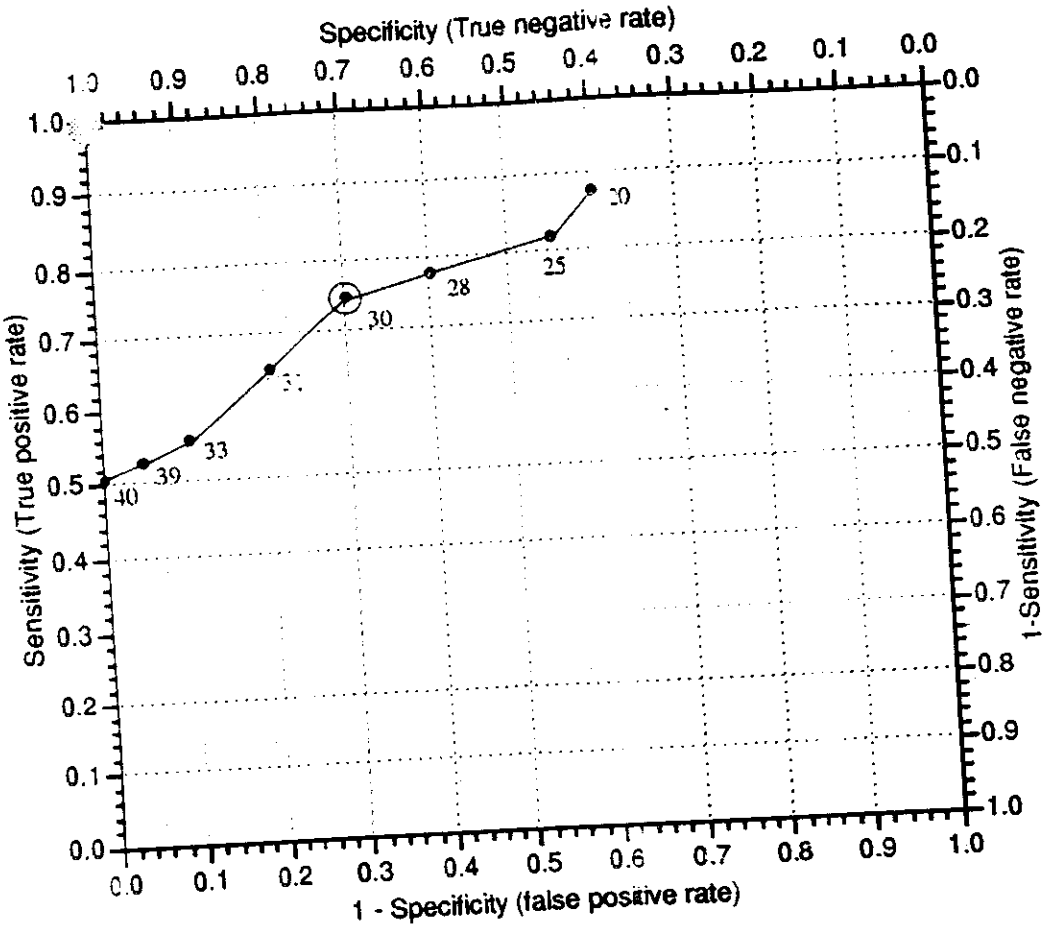

Fig. (12): Receiver Operator Characteristic Curve (ROC curve) for serum TGF-alpha levels in HCC group.

The best cut off level for serum TGF-alpha is 30 pg/ml (circle). A point closest to the upper left corner (shadowed circle) where both sensitivity and specificity are ideal (100%).

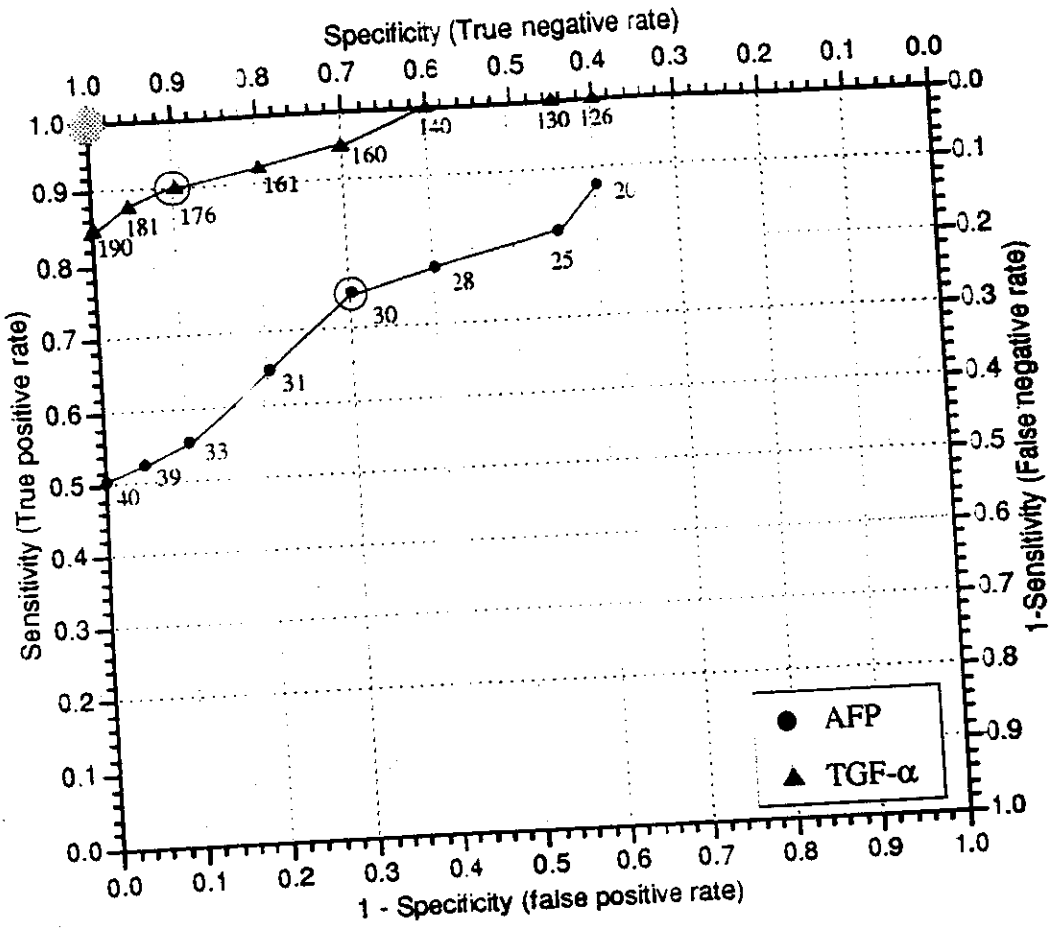

Fig. (13); Receiver Operator Characteristic Curve (ROC curve) for serum TGF-alpha and AFP levels in HCC group.

The ROC curve is used here to compare the two diagnostic tests. *The curve nearer to the upper left pole* is the one which has the greater sensitivity and specificity and hence the more accurate of the two. Moreover, *the area under the curve* represents the overall accuracy of each test. The larger this area, the better the test. These two factors fit with the AFP curve which is better than TGF-alpha in diagnosis of hepatocellular carcinoma.