Table(1) : An Over View on the relevant history and clinical data of the Studied cases:

Variable	Number of cases
Sex: Female Male	 53 (52%) 49 (48%)
Age	(40-84) years 58±7.1
Abdominal pain	96 (94.1%)
Fever	40 (39.2%)
Vomiting	11 (10.7%)
Diarrhea	5 (0.4%)
Upper GIT bleeding	22 (21.5%)
Hepatic encephalopathy	29 (28.4%)
Jaundice	68 (66.6%)
Past history of Schistomsiasis	55 (53.9%)

The studied patients were 53 female (52%) and 49 male (48%). Most of patients presented by abdominal pain(94.1%), jaundice (66.6%), fever(39.2%), hepatic encephalopathy (28.4%) and upper GIT bleeding (21.5%). 53.9% of patients had Past history of schistosomiasis.

Figure (1): The studied patients according to gender.

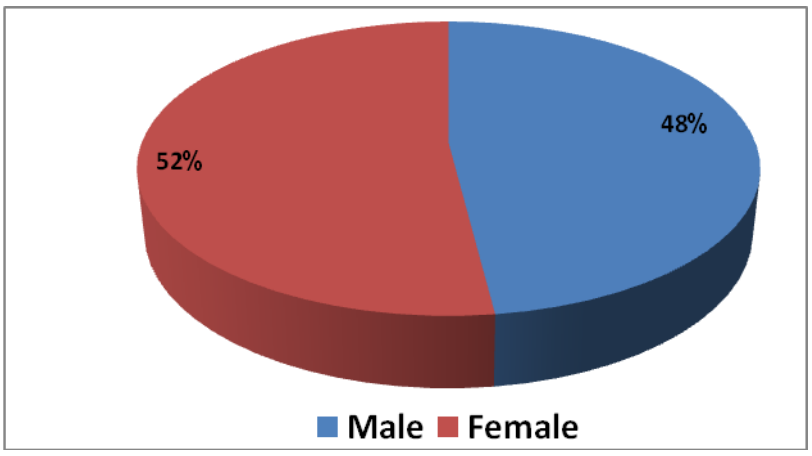

Table (2): Clinical examination of all studied cases:

Variable	Number of cases (%)
General examination:	
Pallor	89 (87.2%)
Jaundice	68 (66.6%)
Flapping tremors	19 (18.6%)
Systolic blood presure	109.8±10.0
diastolic blood presure	71.9±8.5
fever	40 (39.2%)
Abdominal examination:	
Abdominal tenderness	70 (68.6%)
Liver	
Palpable	6 (5.9%)
Not Palpable	96 (94.1%)
Spleen	
Palpable	10 (9.9%)
Not Palpable	92 (90.1%)
Ascites	
Moderate	72 (70.6%)
Tense	30 (29.4%)

As regard general examination of studied patients pallor was detected in 87.2%, jaundice in 66.6%, fever in 39.2% and Flapping tremors in 18.6%.

On abdominal examination 68.6% of patients had abdominal tenderness, 5.9% had enlarged liver, 9.9% had splenomegaly, 70.6% had moderate ascites and 29.4% had tense ascites.

Figure (2): Blood pressure of studied cases:

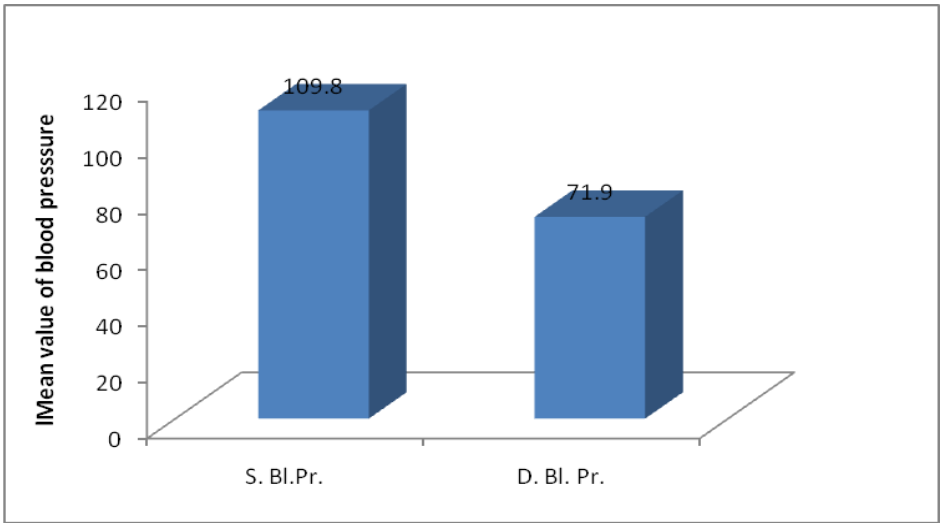

Table (3): Classification of studied cases according to Modified Child's Pugh classification :

Grading	Number of cases
Child Class B	36 (35.3%)
Child Class C	66 (64.7%)

In studied patients 35.3% were child class B and 64.7% were child class C.

Figure(3): Classification of studied cases according to Modified Child's Pugh classification.

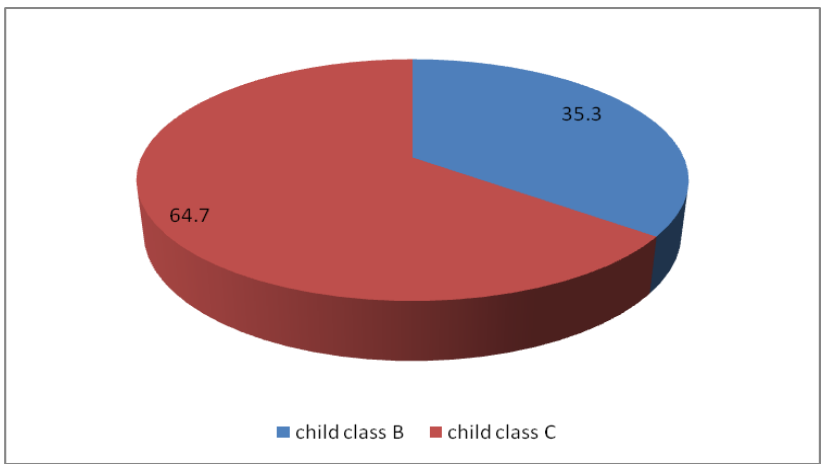

Table (4): Classification of studied cases according to ascitic fluid PMN:

	Non SBP group	SBP group
- Ascitic fluid PMN ≥ 250 c/mm^3	0	21
- Ascitic fluid PMN ≤ 250 c/mm^3	81	0

According to ascitic fluid PMN count the studied cases were classified into two groups:

* Group I (SBP group):

Included 21 (20.6%) cases who had ascitic fluid PMN count ≥ 250 c/mm^3.

* Group II (non SBP group):

Included 81 (79.4%) cases who had ascitic fluid PMN count ≤ 250 c/mm^3.

Figure (4): Classification of the studied groups according to ascitic fluid PMN count.

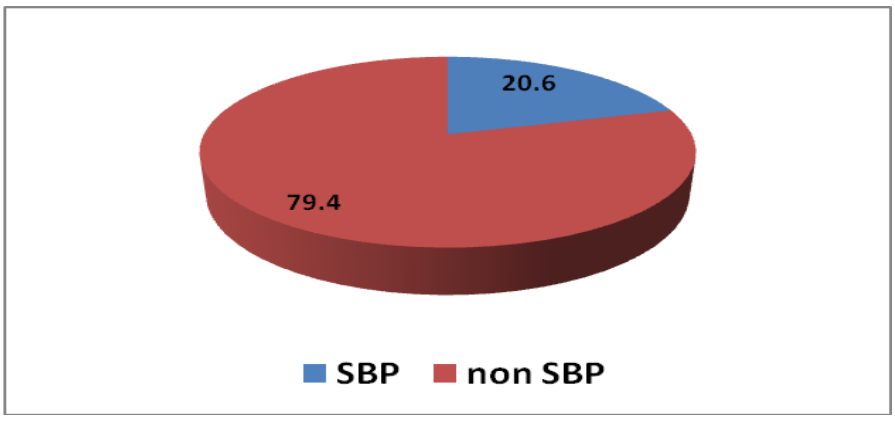

Table (5): General features of SBP and non SBP groups:

Characteristics	Non SBP group No = 81	SBP group No = 21
- Age (years):		
Range	50 – 84	40 – 66
Mean ± SD	58.5 ± 7.2	56.1 ± 6.8
- Sex:		
Male	36 (44.4%)	13 (61.9%)
Female	45 (55.6%)	8 (38.1%)

SBP group included 13males (61.9%) and 8 females (38.1%). Their age ranged from 40 to 66 years with a mean of 56.1±6.8.

In non SBP group, there were 36 males (44.4%) and 45 females (55.6%). Their age ranged from 50 to 84 years with a mean of 58.5±7.2.

Concerning age and sex there was no statistical significant difference between both groups.

Figure (5): Age of the studied groups.

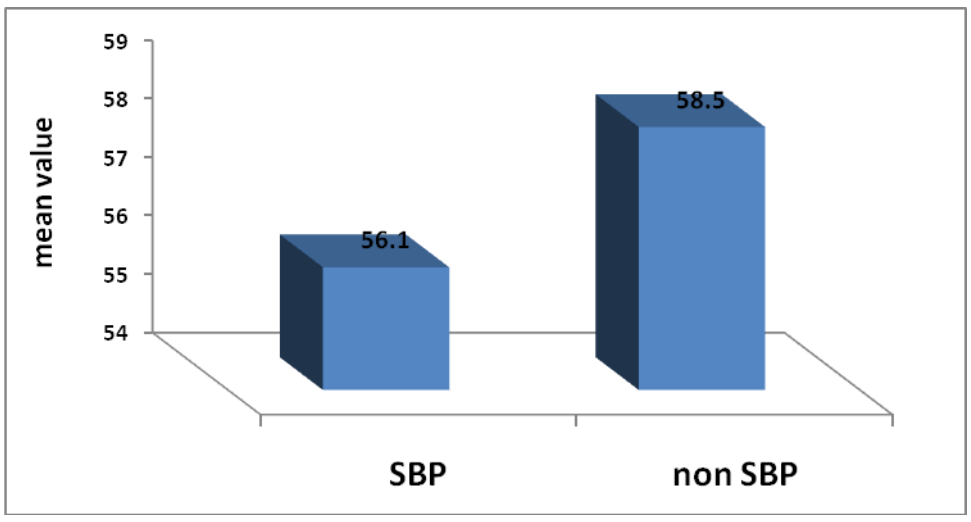

Figure (6): Studied groups according to gender.

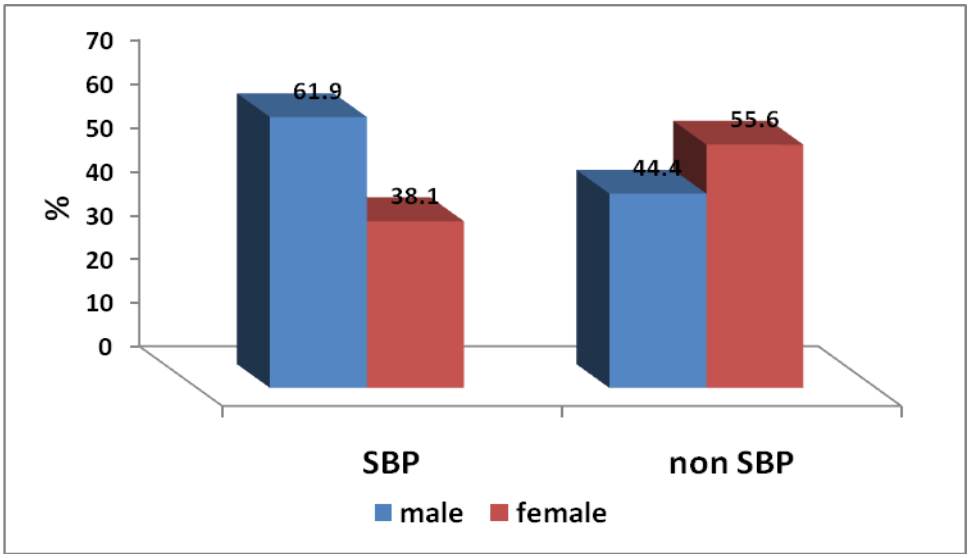

Table (6): Clinical presentations of studied groups:

Variable	Non SBP N=81	SBP N=21	P
Abdominal pain	75 (92.6%)	21 (100.0%)	> 0.05
Fever	28 (34.6%)	12 (57.1%)	< 0.05*
Vomiting	9 (11.1%)	2 (9.5%)	> 0.05
Diarrhea	1 (1.2%)	4 (19.1%)	< 0.001*
Upper GIT bleeding	15 (18.5%)	7 (33.3%)	> 0.05
Hepatic encephalopahy	23 (28.4%)	6 (28.6%)	> 0.05
Jaundice	54 (66.7%)	14 (66.7%)	> 0.05

In the present study, patients with SBP commonly presented by abdominal pain (100%), fever (57.1%) and diarrhoea (19.1%) with a highly statistical significant difference compared to non SBP group.

No statistically significant difference between SBP and non SBP group regarding hepatic encephalopathy, Jaundice, Upper GIT bleeding or vomiting.

Figure (7): Clinical presentations of studied groups.

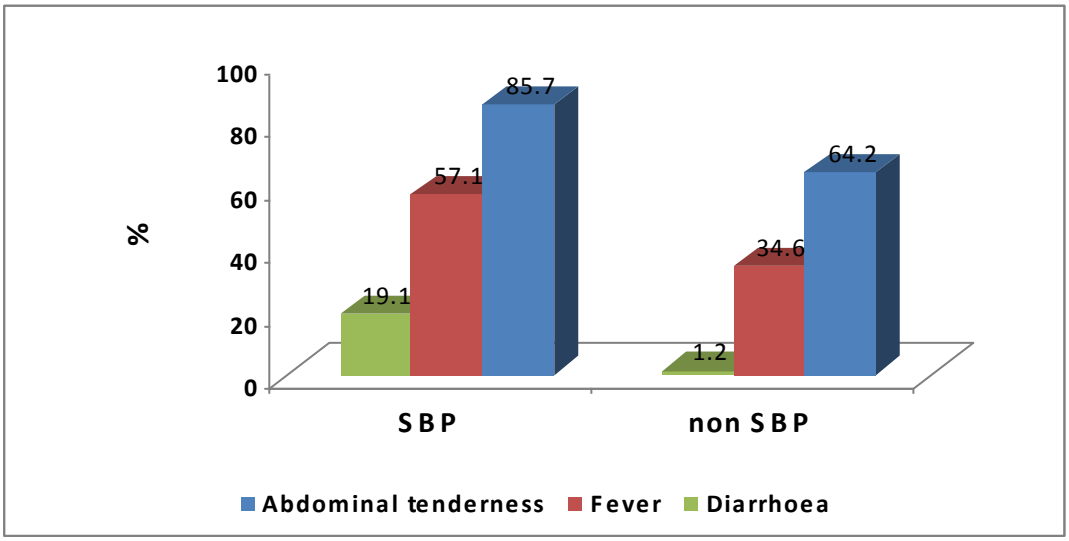

Table (7): Clinical examination of the studied cases:

Variable	Non SBP N=81	SBP N=21	P
General examination:			
Pallor	72 (88.9%)	17 (80.9%)	> 0.05
Jaundice	54 (66.7%)	14 (66.7%)	> 0.05
Flapping tremors	16 (19.8%)	3 (14.3%)	> 0.05
temperature	37.2 ± 0.12	39.22 ± 0.2	< 0.05*
Systolic blood presure	110.4 ± 9.7	107 ± 11.4	> 0.05
Diastolic blood presure	72.3 ± 8.7	70 ± 7.7	> 0.05
Abdominal examination:			
Umbilical hernia	49 (60.5%)	12 (57.1%)	> 0.05
Abdominal tenderness	52 (64.2%)	18 (85.7%)	< 0.05*
Liver			
Palpable	5 (6.2%)	1 (4.8%)	> 0.05
Not Palpable	76 (93.8%)	20 (95.2%)	> 0.05
Spleen			
Palpable	9 (11.1%)	1 (4.8%)	> 0.05
Not Palpable	72 (88.9%)	20 (95.2%)	> 0.05
Ascites			
Moderate	57 (70.4%)	15 (71.4%)	> 0.05
Tense	24 (29.6%)	6 (28.6%)	> 0.05

As regard the clinical examination of studied patients abdominal tenderness (85.7%) and fever (57.1%) were significantly higher in SBP than non SBP groups.

No statistically significant difference between both groups regarding pallor, jaundice, flapping tremors, blood pressure levels, hepatomegaly, splenomegaly or ascites.

Figure (8): Temperature in studied groups.

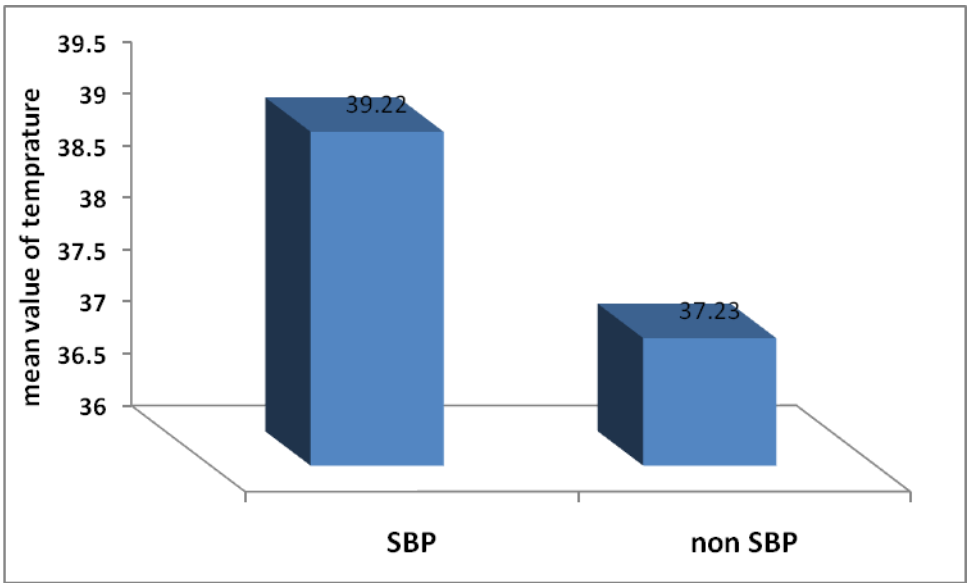

Table (8): Laboratory investigations of studied groups:

Variable	Non SBP	SBP	P
Hemoglobin(Hb%)	9.7 ± 1.8	10.1 ± 1.3	> 0.05
RBCs (m cells/cc)	3.5 ± 0.7	3.3 ± 0.6	> 0.05
WBCs (thousands/cc)	6390 ± 2760.1	8033.3 ± 3172.9	> 0.05
Platelets (thousands/cc)	121.2 ± 51.02	105.1 ± 83.5	> 0.05
ESR (mm/hr)	71.4 ± 42.1	57.6 ± 36	> 0.05
PT second	25.8 ± 10.96	21.5 ± 6.4	> 0.05
Random glucose (mg/dl)	115.2 ± 39.9	101.8 ± 30.2	> 0.05
Serum albumin (g/dl)	2.4 ± 0.5	2.3 ± 0.4	> 0.05
Total bilirubin (mg/dl)	2.8 ± 2.1	4.1 ± 2.1	<0.05*
Direct bilirubin (mg/dl)	1.55 ± 1.88	1.77 ± 1.86	>0.05
Serum creatinine (mg/dl)	1.2 ± 0.47	1.4 ± 0.64	> 0.05
ALT (IU/L)	53.7 ± 26.2	60.1 ± 24.6	> 0.05

In the present study, the level of total bilirubin showed a significant difference between both groups. Regarding Hb%, RBCs, WBCs, platelets counts, ESR, PT, random blood glucose, serum albumin, serum creatinine, direct bilirubin and ALT there was no significant difference between both groups.

Figure (9): Serum total bilirubin in studied patients.

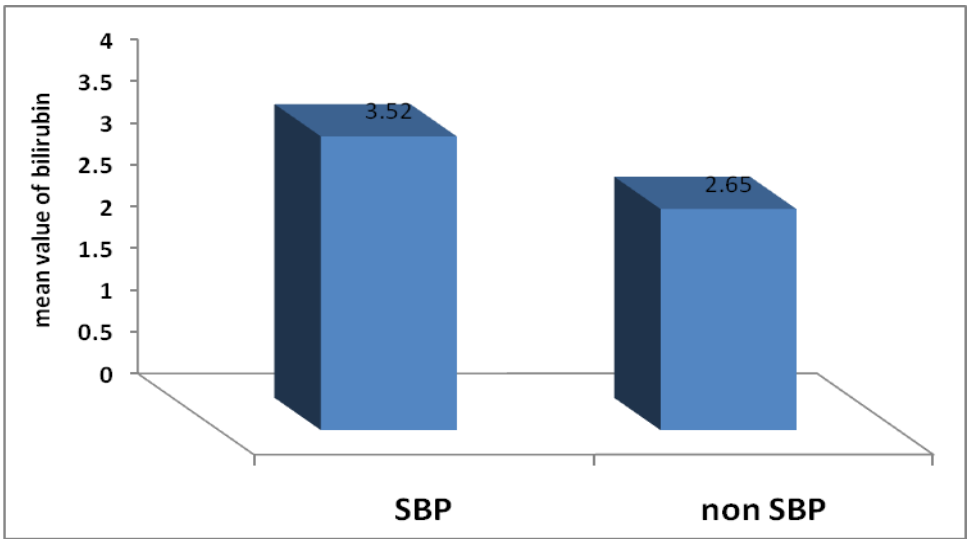

Table (9): Abdominal ultrasonographic findings among studied groups:

Variable	Non SBP	SBP	P
	No	No	
Liver			
Size			
Enlarged	0 (0.0%)	0 (0.0%)	-
Shrunken	81 (100.0%)	21 (100.0%)	-
Texture			
Bright	0 (0.0%)	0 (0.0%)	-
Coarse	81 (100.0%)	21 (100.0%)	-
Heterogenous	14 (17.3%)	6 (28.6%)	> 0.05
Focal lesions	1 (1.2%)	2 (9.5%)	< 0.05*
Spleen			
Average	2 (2.5%)	0 (0.0%)	> 0.05
Enlarged	76 (93.8%)	21 (100.0%)	> 0.05
Surgically removed	3 (3.7%)	0 (0.0%)	> 0.05
Amount of ascites			
Moderate	57 (70.4%)	15 (71.4%)	> 0.05
Severe	24 (29.6%)	6 (28.6%)	> 0.05
Internal echoes	2 (2.5%)	12 (57.1%)	< 0.001*

According to abdominal ultrasonographic findings among studied groups all cases had shrunken liver. Splenomegaly was found in all cases of SBP while in non SBP patients it was detected in 93.8% with no significant difference.

In SBP patients, the internal echoes were detected in (57.1%) while in the other group they were detected in (2.5%) with a highly significant difference between both groups.

Figure (10): Focal lesions in both groups.

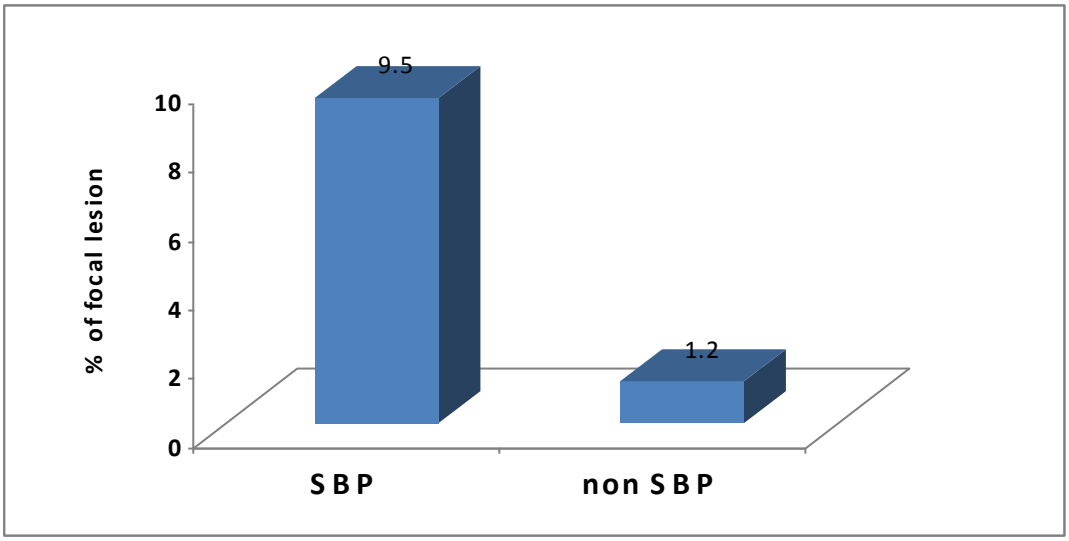

Figure (11): Presence of internal echoes in ascites in both groups.

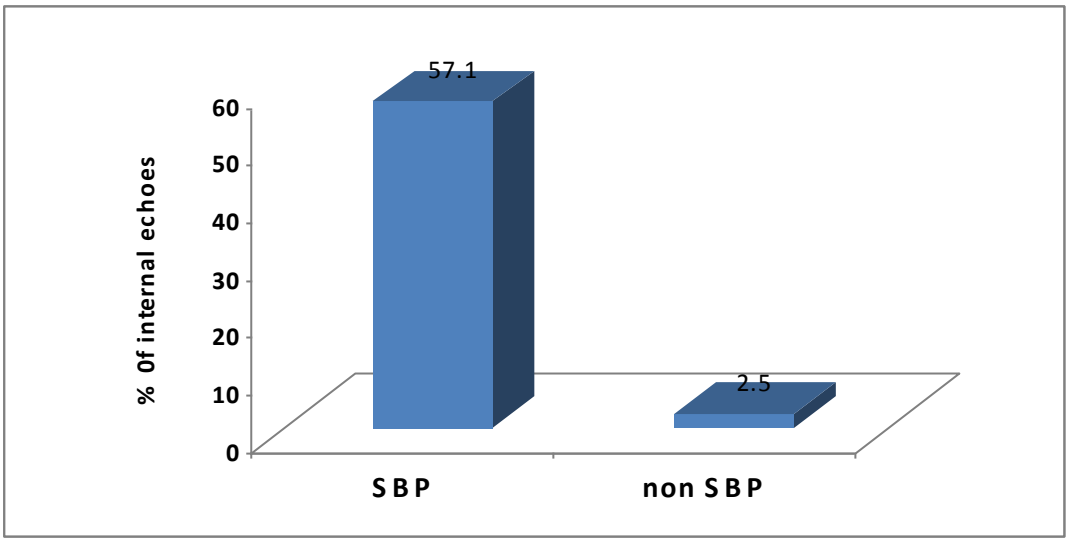

Table (10): Child's Pugh classification of both groups:

Variable	Non SBP	SBP	P
	N=81	N=21	
Child Class B	27 (33.3%)	9 (42.9%)	> 0.05
Child Class C	54 (66.7%)	12 (57.1%)	> 0.05

According to modified Child's Pugh classification, SBP group included 9 patients with child class B and 12 patients with child class C, while non SBP group included 27 patients with class B and 54 patients with class C.

Figure(12): Studied groups according to Child's Pugh classification.

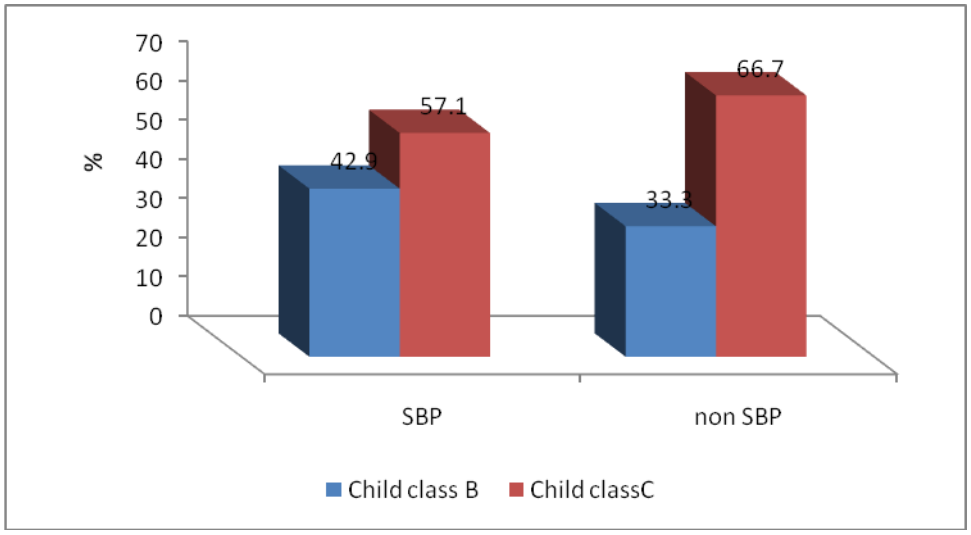

Table (11): Ascitic fluid physical examination among the studied groups:

Variable	Non SBP(N=81)	SBP(N=21)	P
Clear	71 (87.7%)	1 (4.8%)	< 0.001*
Turbid	4 (4.9%)	18 (85.7%)	< 0.001*
Red	6 (7.4%)	2 (9.5%)	> 0.05

Ascitic fluid was turbid in 85.7% and clear in 4.8% of SBP cases with a highly statistical significant difference between two groups.

Figure (13): Ascitic fluid physical examination among the studied patients.

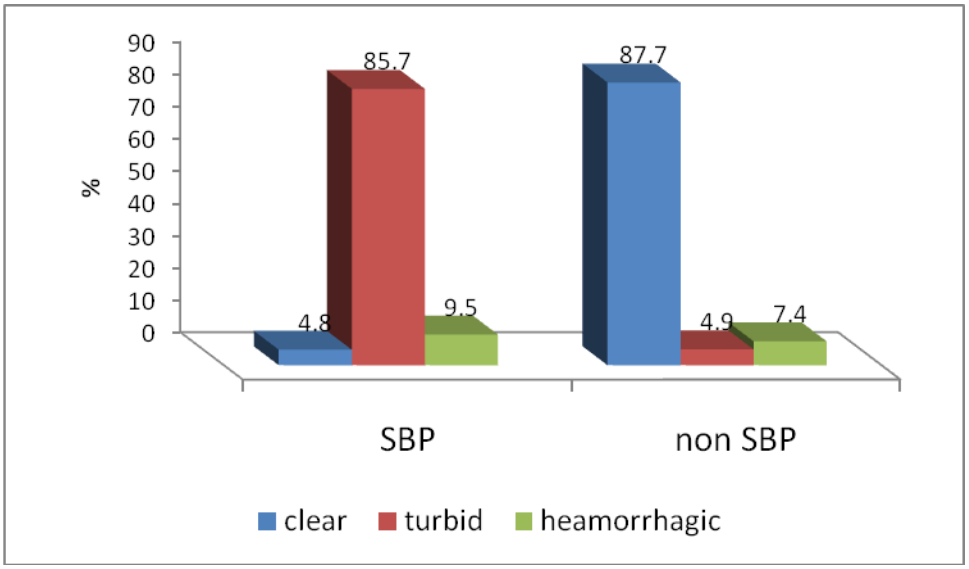

Table (12): Ascitic fluid characters of both groups (cell count and chemical analysis).

Variable	Non SBP	SBP	P
TLC	95.9±50.4	2300.3±2157.8	<0.001*
PMN	76.3±39.8	1671.2±1096.5	<0.001*
AFLAC	140.7±147.3	3434.8±2448.9	<0.001*
Ascitic albumin	0.42±0.25	0.36±0.16	>0.05
SAAG	1.94±0.52	1.98±0.39	>0.05

There was a highly statistical significant difference regarding TLC and PMN count in ascitic fluid and ascitic fluid lactofferin of SBP group compared to non SBP group.

Figure (14): AFLAC levels in both groups.

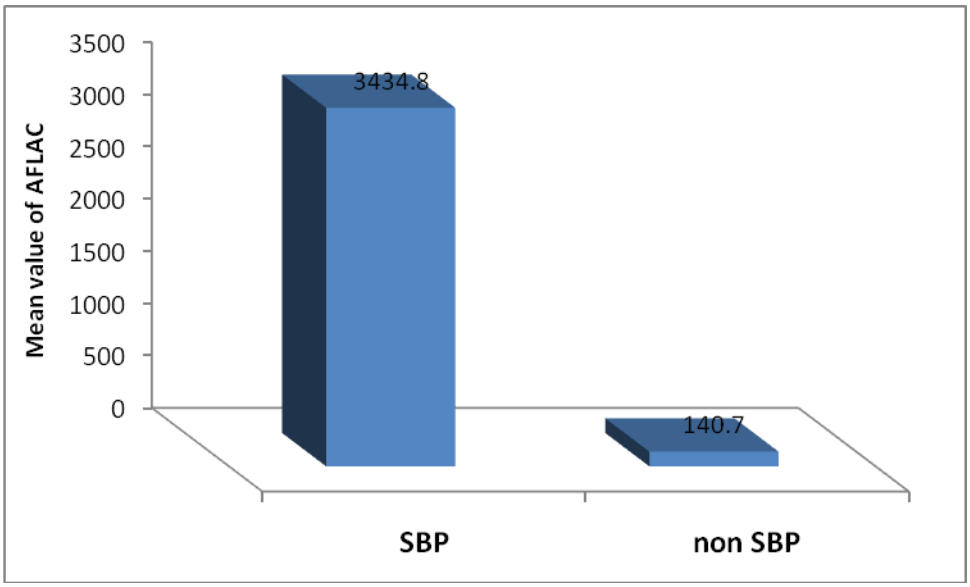

Table (13): Ascitic fluid characters of both groups (cell count in comparison between AFLAC and Multistix).

Variable	Non SBP (N=81)	SBP (N=21)	P
PMN ≥ 250 cells/mm^3	0 (0%)	21(100.0%)	< 0.001*
Lactofferrin ≥ 252ng/ml	3(3.7%)	21 (100.0%)	< 0.001*
Multistix +ve	2 (2.5%)	19 (90.5%)	< 0.001*

There was a highly statistical significant difference regarding PMN count in ascitic fluid, ascitic fluid lactofferin and examination by multistix 10 SG urine screening test of SBP group compared to non SBP group.

Figure (15): Ascitic fluid characters of both groups.

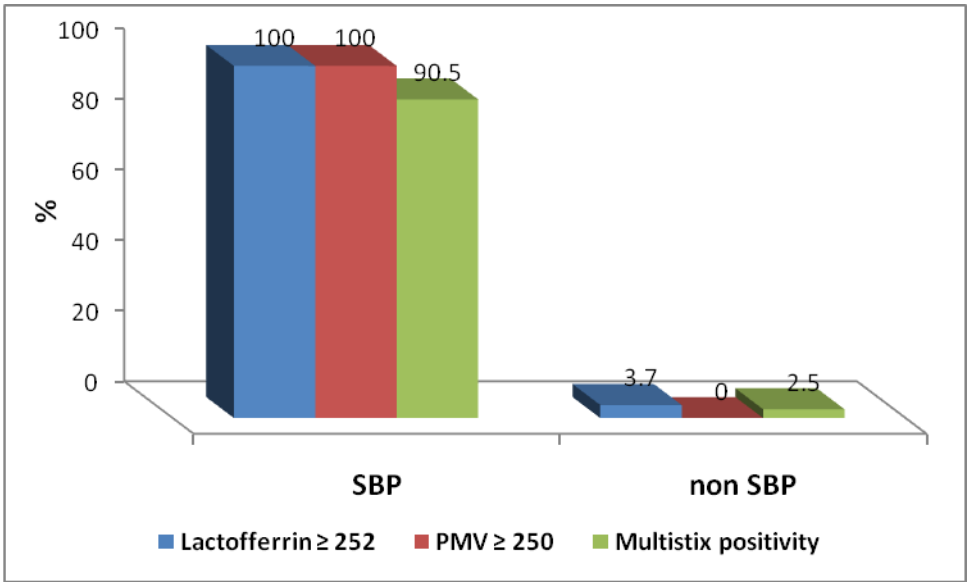

Table (14): Impact of treatment on ascitic fluid chemical composition among the SBP group:

Variable	Pretreatment	Posttreatment	P
AFLAC levels	3434.8±2448.9	201.4±185.6	< 0.001*
PMN count	1671.2±1096.5	503.7±777.6	< 0.001*

There was a highly statistical significant difference regarding PMN count in ascitic fluid and ascitic fluid lactofferin levels in SBP group pretreatment and posttreatment.

Figure (16): Impact of treatment on ascitic fluid chemical composition and results of multistix among the SBP group:

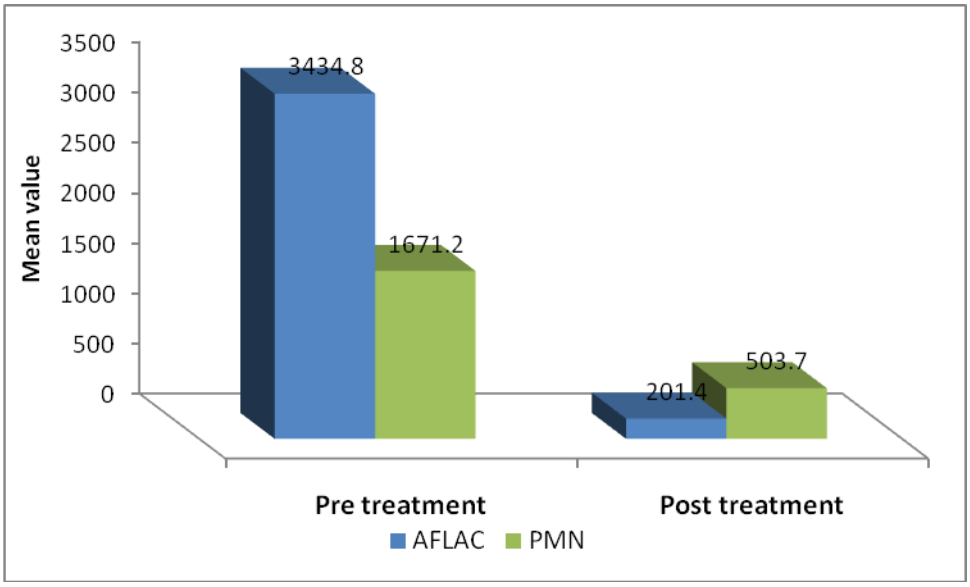

Table (15): Impact of treatment on the results of multistix among the SBP group:

Timing variable	Pretreatment N (%)	Posttreatment N (%)	P
Multistix positivity	19 (90.5%)	4 (19%)	< 0.001*

There was a highly statistical significant difference regarding examination by multistix 10 SG urine screening test of SBP group pretreatment and posttreatment

Figure (17): Impact of treatment on the results of multistix among the SBP group

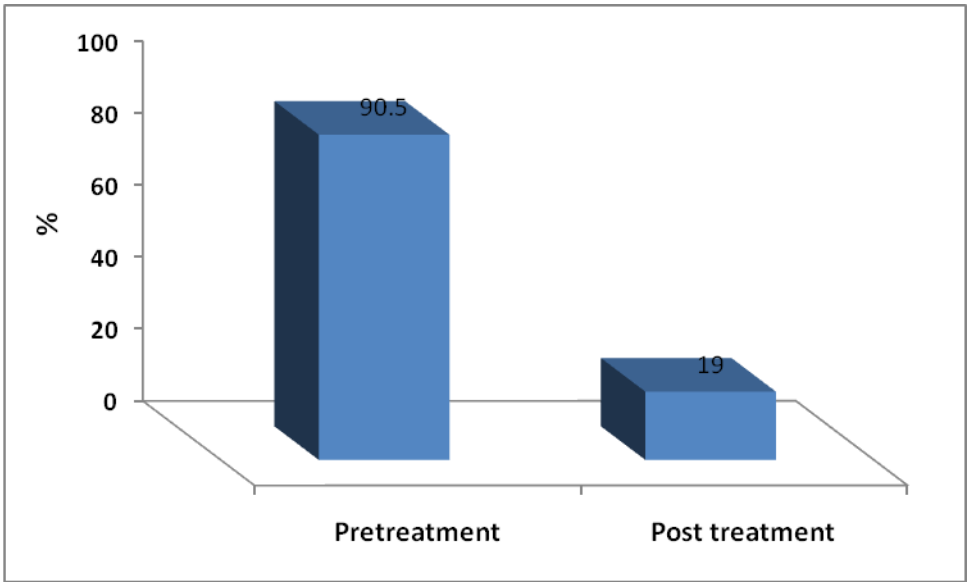

Table (16): Cut off value, sensitivity, specificity and accuracy of AFLAC to diagnose SBP:

Cut off value	Sensitivity	Specificity	PPV	NPV	AUC	Accuracy	P	95%CI
255ng/ml	100.0%	88.9%	70.0%	100.0%	0.98	98.4%	< 0.001*	(0-1)

At cut off of 255 the sensitivity of AFLAC to diagnose SBP was (100%) ,specificity(88.9%) and the area under the curve was 0.98.

Figure (18): ROC curve of AFLAC.

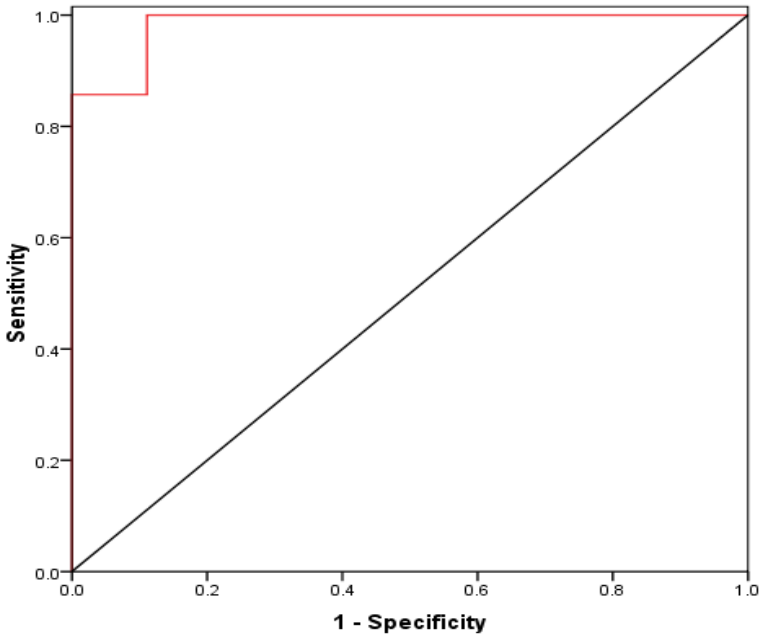

Table (17): Sensitivity, specificity and accuracy of Multistixs for diagnosis of SBP.

Sensitivity	Specificity	PPV	NPV	AUC	Accuracy	P	95%CI
90.5%	93.8%	79.2%	97.4%	0.9	92.2%	< 0.001*	(0.81-1)

The sensitivity of multistixs to diagnose SBP was (90.5%) and specificity was (93.8%),the area under the curve was 0.9.

Figure (19): ROC curve of Multistix.