RESULTS

The results of this work were demonstrated in the following tables and figures.

Table (1):-Aetiology and character of pleural effusion among the studied cases:-

Group	No	%
Tuberculous group(I)	10	33.33%
Malignant group (II):-	10	33.33%
a-Mesothelioma.	2	6.66%
b-Adenocarcinoma.	5	16.66%
c-Metastatic lesion.	3	10%
Transudative group (III):-	10	33.33%
a-Congestive heart failure.	3	10%
b-Liver cell faliure.	5	16.66%
c-Chronic renal cell faliure.	2	6.66%
Total	30	100%

Table (1) elucidated the aetiology and characters of pleural effusion among the studied cases.The study was carried on 30 patients having pleural effusion.They were classified into three groups as follow:- Tuberculous group (No:10) 33.33 % of all patients.Malignant group (No:10) 33.33% f all patients in the study.Most of the malignant cases were due to mesothelioma (2 cases,6.66%), Adenocarcinoma (5 cases,16.66%) and metastatic lesion (3 cases,10%).Transudative group (No:10) 33.33% of all patients in the study.Transudative effusion due to congestive heart failure (3 cases,10%), liver cell failure (5cases,16.66%) and chronic renal failure (2 cases,6.66%).

Table (2):- Age distribution among studied groups.

Age	GI (Tuberculous group)	GII (Malignant group)	GIII (Transudative group)
Range	10-40 years	40-70 years	30-80 years
Mean	25	58.2	60.7
± SD	9.30	7.84	16.89
t. test		**27.635**	
P value		**0.001**	

Table (2) and figure (1) show the age distribution among studied groups. Tuberculous effusion developed mostly in adults with age ranged between 10-40 years with mean of 25 ± 9.3 years. The age ranged in malignant pleural effusion was 40-70 years with mean of 58.2 ± 7.84 years while in the transudative group was 30-80 years with the means of 60.7±16.89 years.By statistical analysis show significant lower mean age in tuberculous group than others groups.

Fig. (1):- Age distribution among studied groups.

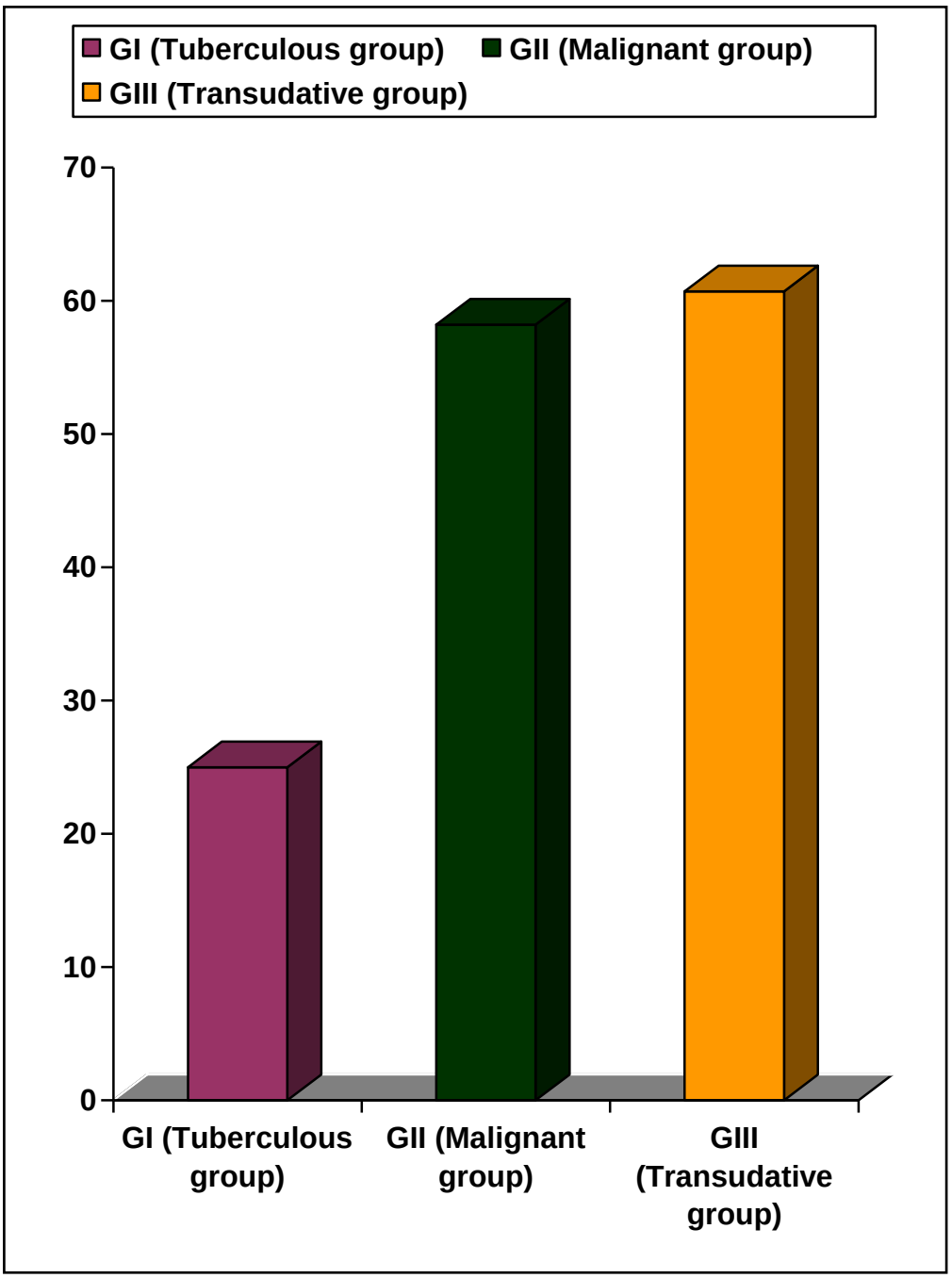


Table (3):- Sex distribution among studied groups.

Group / Sex	Tuberculous group		Malignant group		Transudative group	
	NO	%	NO	%	NO	%
Male	7	70	4	40	5	50
Female	3	30	6	60	5	50
Total	10	100	10	100	10	100

Table (3) and figure (2) show sex distribution among studied groups. Tuberculous group included 10 patients, seven males (70%) and three females(30%)**.** Malignant group included 10 patients, four males (40%) and six females (60%).And transudative group included 10 patients, five males (50%) and fives females (50%).

Fig (2):- Sex distribution among studied groups.

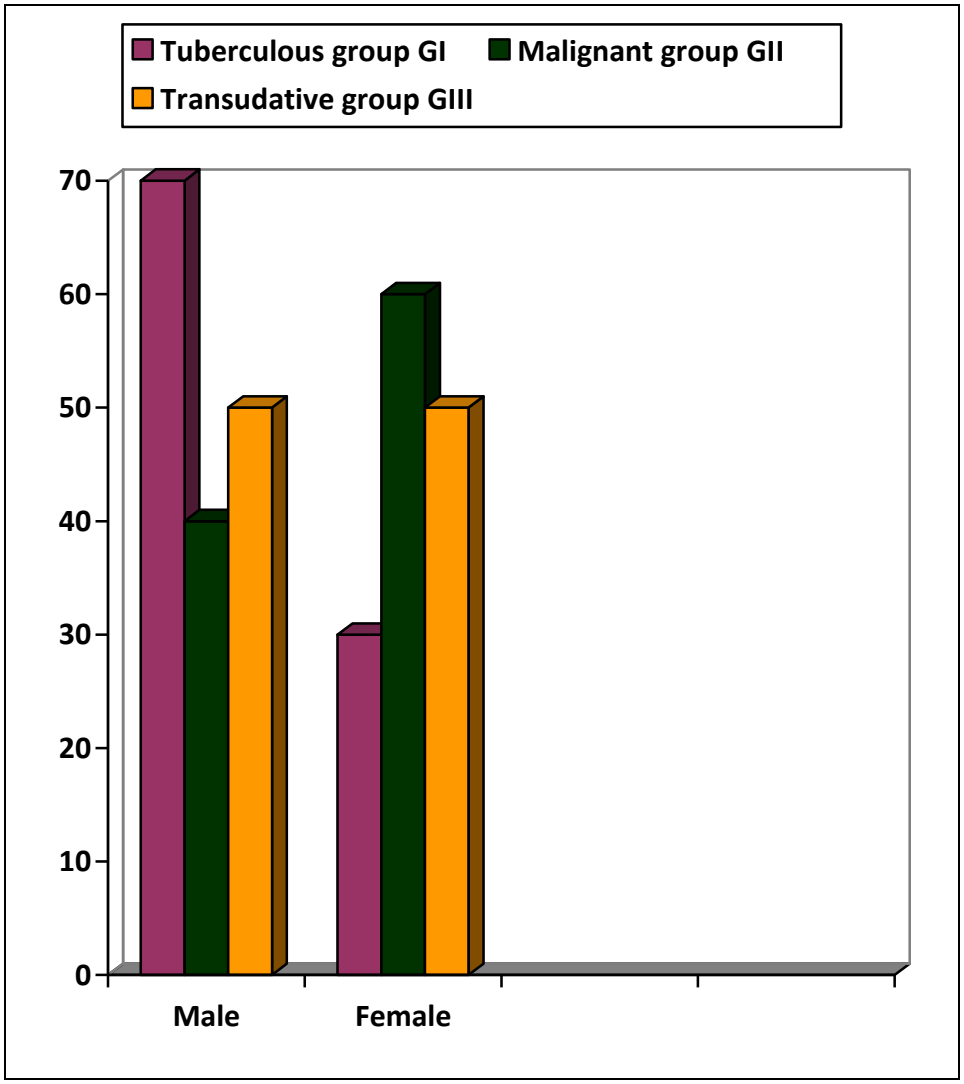


Table (4):-Side of pleural effusion in studied groups.

Group / Site	Tuberculous group		Malignant group		Transudative group	
	NO	%	NO	%	NO	%
Right side(RT)	4	40	5	50	3	30
Left Side(LT)	4	40	4	40	2	20
Bilateral	2	20	1	10	5	50
Total	10	100	10	100	10	100

Table (4) and figure (3) show the affected side in each group in the present study as following:-

1- Tuberculous group: was right sided in four cases (40%), left sided in four cases (40%) and bilateral in two cases (20%).
2- Malignant group: was right sided in five cases (50%) , left sided in 4 cases (40%) and bilateral only in one case (10%).
3- Transudative group: was right sided in three cases (30%) , left sided in two cases (20%) and bilateral in five cases (50%).

Fig (3):-Affected side distribution of pleural effusion in all groups.

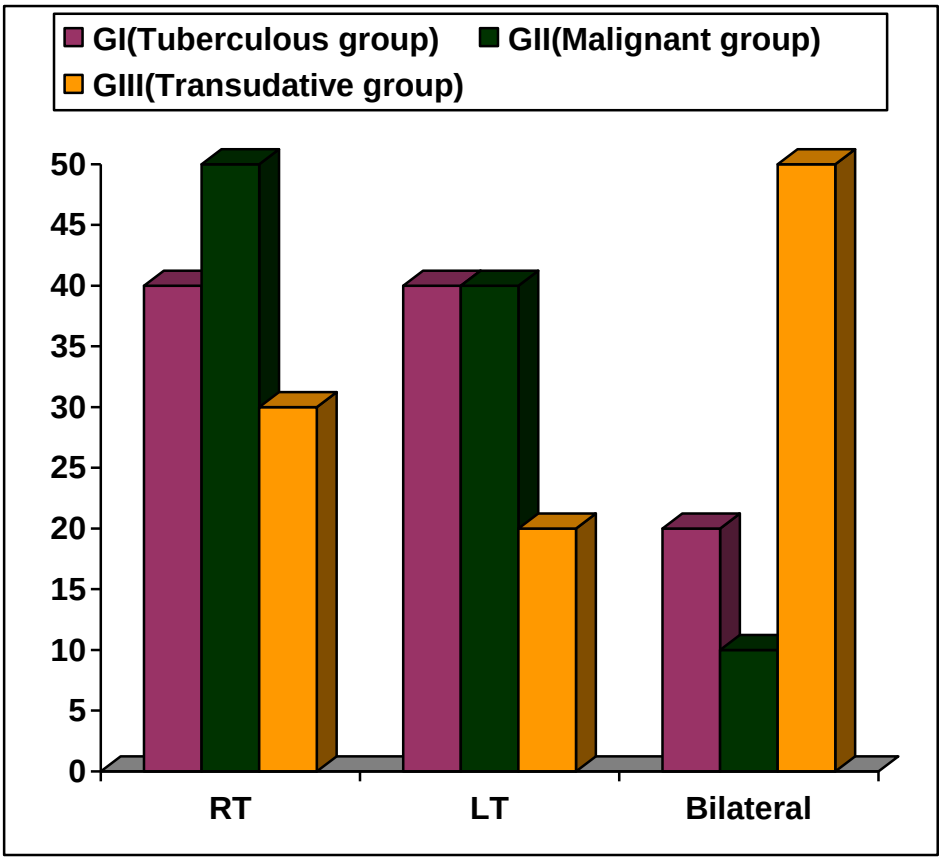


Table (5):- Erythrocyte sedimentation rate (ESR) among studied groups.

ESR 1st hr (first hour)	GI(Tuberculous group)	GII(Malignant group)	GIII(Transudative group)
Range	35-115	32-118	35-85
Mean	70.80	71.33	63.90
± SD	10.61	8.84	4.73
t. test	**0.458**		
p. value	**0.632**		

ESR 2nd hr (second hour)	GI(Tuberculous group)	GII(Malignant group)	GIII(Transudative group)
Range	72-135	66-136	70-125
Mean	91.37	104.55	100.70
+ SD	10.51	8.25	5.42
t. test	**0.253**		
p. value	**0.963**		

Table (5) and Fig (4) Show erythrocyte sedimentation rate (ESR) among studied groups. The mean value of ESR in first hour in tuberculous group was 70.8 ± 10.61 mm, in malignant group was 71.33 ± 8.84 mm and for transudative group was 63.9 ± 4.73 mm respectively.There has been no statistical significant difference between all groups (p=0.632).

The mean value of ESR in second hour was 91.37 ± 10.51 mm for tuberculous group, 104.55 ± 8.25 mm for malignant group and 100 ± 5.42 mm for transudative group respectively. There has been also no statistical significant between three groups.

Fig (4):- Erythrocyte sedimentation rate (ESR) among studied groups.

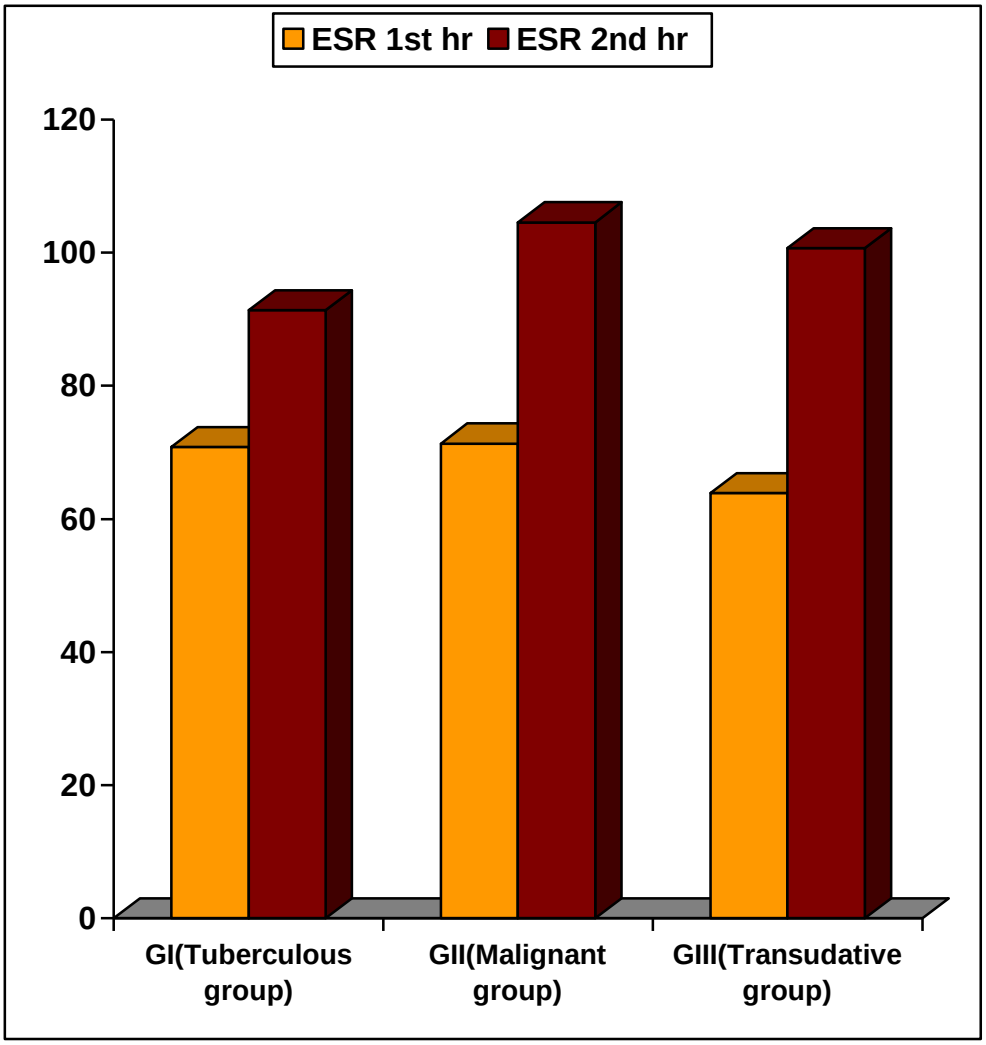


Table (6):Tuberculin test among studied groups.

Tuberculin test	Tuberculous group	Malignant group	Transudative group
Range	8-22	2-10	0-8
Mean	13.60	6.30	4.60
±SD	4.69	3.19	4.14
t test	13.658		
P value	0.001*		

Table (6) and Fig.(5) Show the mean level of tuberculin test among studied groups.There was significant difference between all groups (P< 0.001).The mean level of tuberculin test was high in tuberculous group (13.6± 4.69 mm) versus malignant group it was (6.3± 3.19 mm) and transudative group was (4.6± 4.14mm).

Fig.(5):- Tuberculin test among studied groups.

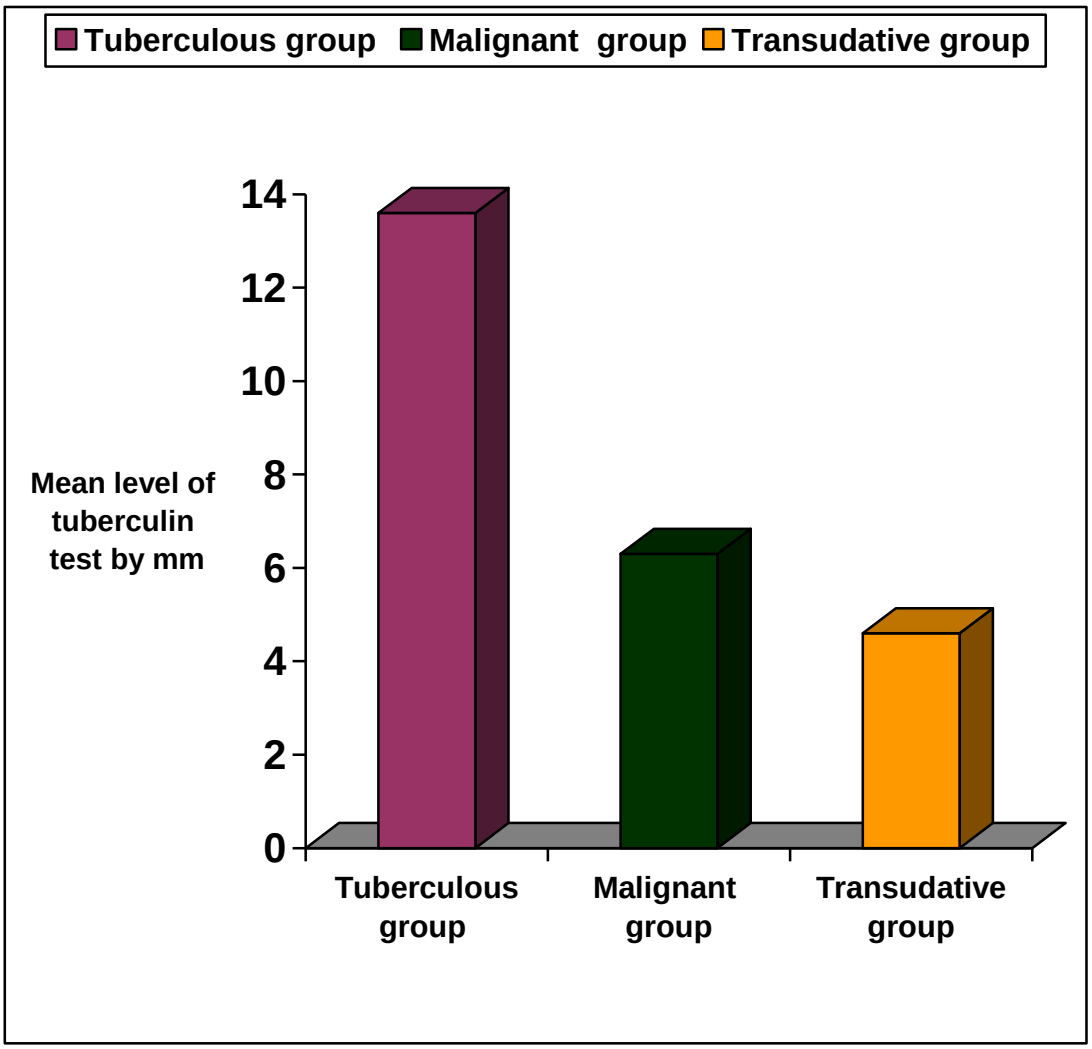


Table (7): Complete blood picture (CBC) in all groups.

Complete blood picture (CBC)		Tuberculous group	Malignant group	Transudative group	p
Hemoglobin(HB)	**Mean**	11.91	11.82	10.72	0.632
	± SD	1.o3	2.16	1.95	(NS)*
Total leucocytic count	**Mean**	6761.9	5421.3	6020	0.963
	± SD	794.7	976.1	679.3	(NS)
Lymphocyte percent	**Mean**	37.3	25.4	15.92	0.005
	± SD	4.61	3.16	4.16	(S)**
Monocyte percent	**Mean**	2	1.9	0.7	0.055
	± SD	0.77	0.41	0.45	(NS)
Eosinophil percent	**Mean**	2	2.5	2.1	0.857
	± SD	0.77	0.83	0.69	(NS)
Basophil percent	**Mean**	0.3	0.3	1.4	0.636
	± SD	0.05	0.15	0.7	(NS)
Staff cell percent	**Mean**	4.9	2.1	2.4	0.051
	± SD	o.83	0.5	1.08	(NS)

S** = statistically significant difference.
NS*= no statistically significant difference.

Table (7) showing complete blood picture in all studied groups.From this table concluded,There was significant difference between all groups in lymphocyte pecent (P< 0.005).The mean level of lymphocyte percent was high in tuberculous group (37.3±4.61) versus malignant and transudative group was 25.4±3.16 , 15.92±4.16 respectively.

Table (8): Comparison between different parameters measured in all groups and it is significance in pleural fluid.

	Tuberculous group	Malignant group	Transudative group	t test	P value
Protein g/dl	9.22 ± 4.35	4.73± 0.62	2.47 ±0.28	2.052	0.088
Glucose mg/dl	65.20 ± 18.5	80.1 ±46.6	132± 75.5	4.481	0.025
Lactate dehydrogenase (LDH)IU/L	409.3 ±50.38	369.6±25.8	187.6±57.64	6.420	0.008

As regard protein level in pleural fluid,It was 9.22±4.35 g/dl in tuberculous group, 4.73±0.62 g/dl in malignant group, 2.47±0.28 g/dl in transudative group respectively with no significant difference between all groups.

Glucose level it was high in transudative group than in malignant and tuberculous groups.It was significant difference between all groups ($P< 0.025$).

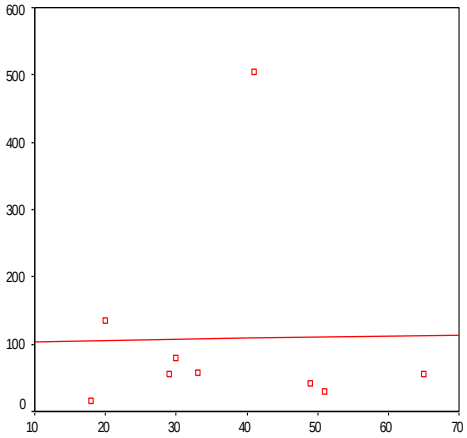
The mean level of lactate dehydrogenase measured in different groups it was 409.3±50.38 IU/L in tuberculous group, 369±25.8 IU/L in malignant group and 187.6±57.64 IU/L in transudative group.There was significant difference between all groups.

Table (9): Correlation between adenosine deaminase (ADA), blood lymphocytes and pleural fluid lymphocytes in tuberculous group*.

	Mean	±SD	Test of significance		
			Between	r	P
1-Adenosine deaminase (ADA)	**92.1**	**24.2**	1 * 2	**0.639**	**0.001**
2-Lymphocytes in blood.	37.3	14.59	2 * 3	0.539	0.002
3-Lymphocytes in pleural fluid.	95.11	4.98	3 * 1	4.693	0.011

***Only eight patients done ADA in tuberculous group.**

Fig (7):Correleation between ADA and lymphocytes in blood in tuberculous group.



Fig(8):Correleation between ADA and lymphocytes in pleural fluid in tuberculous group.

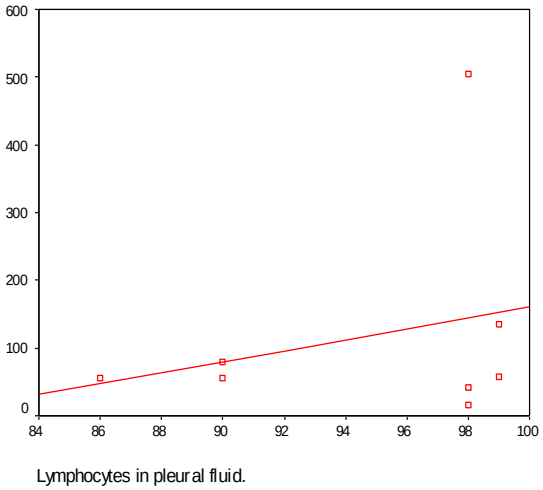


Table (9) and figure (7,8) In searching for the correct diagnosis,Adenosine deaminase (ADA) was measured in only (8) cases in tuberculous group.In there cases, the mean ± SD of ADA level in pleural fluid was 92±24.2,(Table 9).And percentage of lymphocytes in serum was 37.3± 14.59 and in pleural fluid was 95.11± 4.98.

In trying to do correlation between there parameter (Fig 7,8,Table 9) show positive correlation between correlation between ADA and both lymphocytes% in serum and lymphocytes% in pleural fluid.

Table (10): Pleural fluid gamma interferon by copy/ml among patients of different studied groups.

Groups	Mean	± SD	Test of significance			
			Between	t	p	Sig
GI(Tuberculous group)	6055.5	1388.8	I * III	**11.32**	**0.001**	**S***
GII (Malignant group)	380	35.7	I * II	16.82	0.001	S*
GIII (Transudative group)	183	23.52	II * III	11.32	0.001	S*

S * = significant

Table (10) and Fig (9) show the level of gamma interferon by Copy/ml in studied groups.In tuberculous group (GI) it range from 0.2×10^{-3} to 16.7×10^{-3} Copy /ml with the mean 6055.5 ± 1388.8 Copy/ml, In malignant group (GII) it ranged from 0.23×10^{-3} to 0.49×10^{-3} Copy/ml with means of 380±35.7 Copy/ml while in transudative group (GIII) it ranged from 0.09×10^{-3} to 0.29×10^{-3} Copy/ml with means of 183±23.52 Copy/ml.This mean that the level of gamma interferon in pleural fluid was markedly high in tuberculous group in comparison with other groups (malignant and transudative group) and with statistically highly significance difference between all studied groups (P value <0.001).

Fig. (9):-Pleural fluid gamma interferon among studied groups.

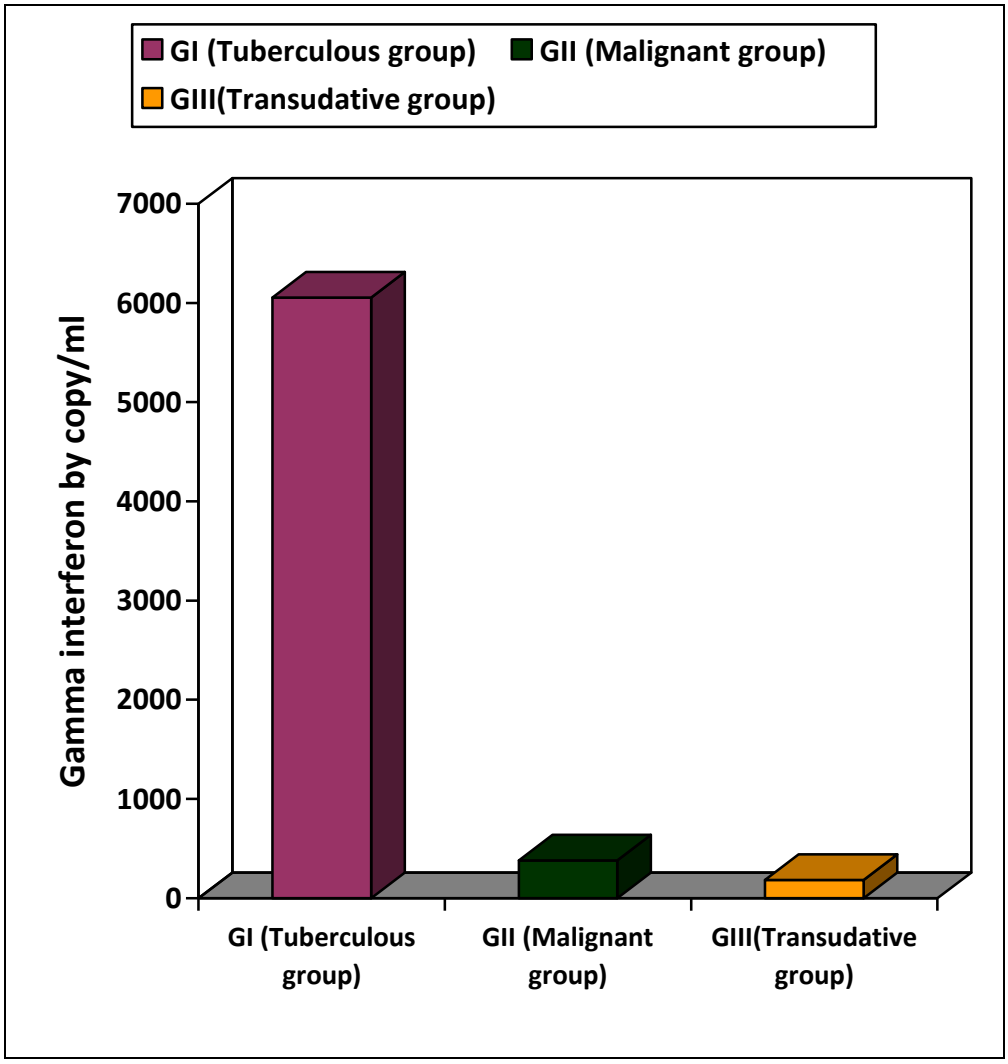


Table (11): Comparison between pleural fluid gamma interferon (IFN-γ) and variable parameters in blood and in pleural fluid among studied groups.

Variable	Pleural fluid gamma interferon					
	Tuberculous group		Malignant group		Transudative group	
	r	P	r	P	r	P
ESR(Erythrocyte sedimentation rate(1st hour)	0.407	0.243	-0.084	0.830	-0.108	0.782
ESR(Erythrocyte sedimentation rate(2nd hr)	0.216	0.549	-0.146	0.756	0.030	0.939
Lymphocytes% in blood	-0.3	0.399	0.144	0.711	-0.316	0.374
Protein in pleural fluid	-0.5	0.141	0.123	0.752	-0.283	0.427
Glucose in pleural fluid	0.340	0.336	0.556	0.120	-0.531	0.114
LDH(Lactate dehydrogenase) in pleural fluid	0.269	0.452	0.325	0.393	0.073	0.840

This table showing non significant correlation between pleural fluid gamma interferon and different parameters in blood as (ESR,lymphocytes %) and in pleural fluid as (protein, glucose and LDH) among all groups.

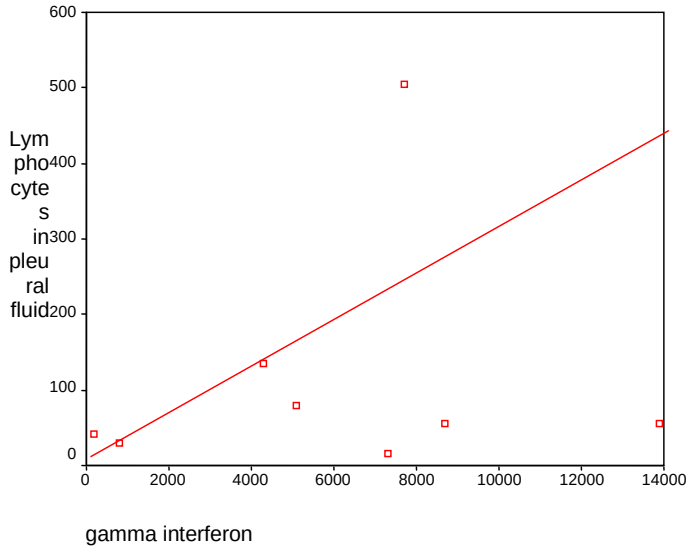
Table (12): Correlation coefficient (r) between pleural fluid gamma interferon (IFN-γ**) and both adenosine deaminase (ADA) and lymphocytes in pleural fluid in tuberculous group*.**

	Pleural fluid gamma interferon	
	r	**P**
Lymphocytes in pleural fluid	**0.639**	**0.049**
Adenosine deaminase (ADA)	**0.708**	**0.019**

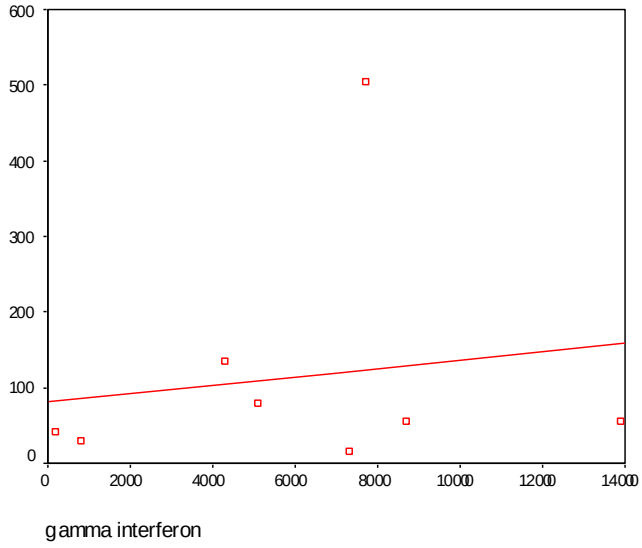
*Only eight cases done ADA in tuberculous group.

Table (12) and figures(10,11) show in only eight cases in which adenosine deaminase (ADA) performed,There was significant positive correlation between pleural fluid gamma interferon (IFN-γ) and it is lymphocyte% content ($P<0.05$).and positive correlation between gamma interferon and adenosine deaminase in tuberculous group ($P<0.05$).

Fig (10):-Correlation between gamma interferon and lymphocytes in pleural fluid.



Fig(11):- Correlation between gamma interferon and adenosine deaminase on tuberculos group.



Table(13):-Evaluation of gamma interferon determination as a test in pleural effusions.

Groups	Tuberculous group G(I)	Malignant group G(II)	Transudative group G(III)
Cut off value	1.465×10^{-3}		
Sensitivity	97.3%	60%	0%
Specificity	93%	50%	10%
Positive predictive value.	96.4%	64.3%	0%
Negative predictive value.	79%	46.5%	10%
Test of accuracy	95%	60%	10%

Table (13) show the accuracy of IFN- γ level in pleural fluid for diagnosis of pleural effusion.

By taking cut off value at 1.465×10^{-3} Copy/ml for pleural fluid gamma interferon.The tuberculous effusions could be distinguished from malignant and transudative effusions with a sensitivity 97.3%, specificity of 93% and a test of accuracy of 97% in tuberculous group, the sensitivity, specificity and accuracy were 60%,50% and 60% in malignant group and 0% in transudative group.