Results

RESULTS

This study is a cross-sectional short-term community based prostate cancer screening study that was conducted in Qualubia Governorate from March 2003 to October 2005, and included one thousands, one hundred and seventy four men.

Population of the study: men with no lower urinary tract symptoms, aged fifty years and older of good health.

Table (8): Age distribution of the studied group.

Age (group)	N	%	Mean± S.D
50~	581	49.5	55.1±2.7
60~	471	40.1	64.4±2.4
≥70	122	10.4	73.4±1.7
Total	*1174*	*100%*	60.8±6.6

This table shows:

- The number of the screened men was 1174 ,with a mean age of 60.8 ±6.6 years.
- In the age group from 50 to less than 60 years the number of men was 581 accounted for 49.5% with a mean age of 55.1 ±2.7 years.

- In the age group from 60 to less than 70 years the number of men was 471 accounted for 40.1% with a mean age of 64.4 ± 2.4 years.
- In the age group of 70 years and older the number of men was 122 accounted for 10.4% with a mean age of 73.4 ±1.7 years.

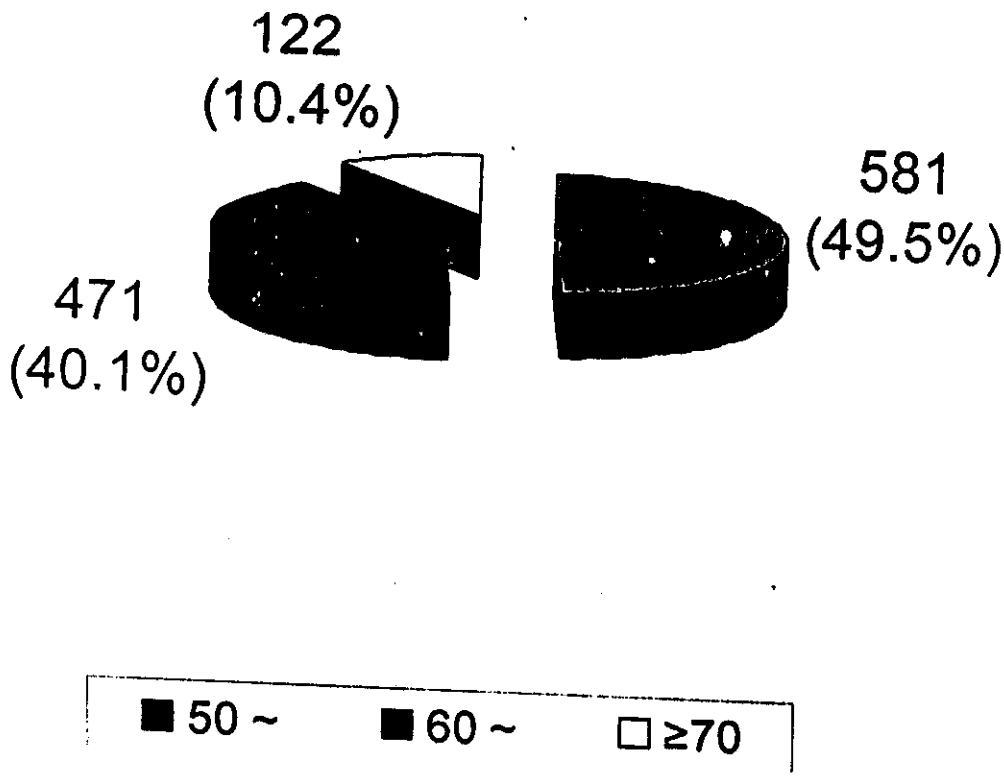

Fig. (19): Age distribution of the studied group

Table (9): PSA ranges of the studied group.

Table (9): PSA ranges of the studied group.

PSA range	*No*	*%*	*Mean ± S.D*
0 ~	487	41.5	0.5 ±0.2
1 ~	299	25.5	1.3 ± 0.2
2 ~	198	16.8	2.2 ± 0.2
3~	103	8.8	3.2 ± 0.3
4~	76	6.5	6.4 ± 1.3
≥10	11	0.9	14.6 ± 3.6
Total	1174	100%	1.8± 2.02

This table shows :

- 487 (41.5%) men had a PSA range from 0 to less than 1 ng/ ml.
- 299 (25.5%) men had a PSA range from 1 to less than 2 ng/ ml.
- 198 (16.8%) men had a PSA range from 2 to less than 3 ng/ ml.
- 103 (8.8%) men had a PSA range from 3 to less than 4 ng/ ml.
- 76 (6.5%) men had a PSA range from 4 to less than 10 ng/ ml.
- 11 (0.9%) men had a PSA range ≥ 10ng/ml.
- The mean PSA for the all screened men was 1.8 ±2.02 ng/ml.

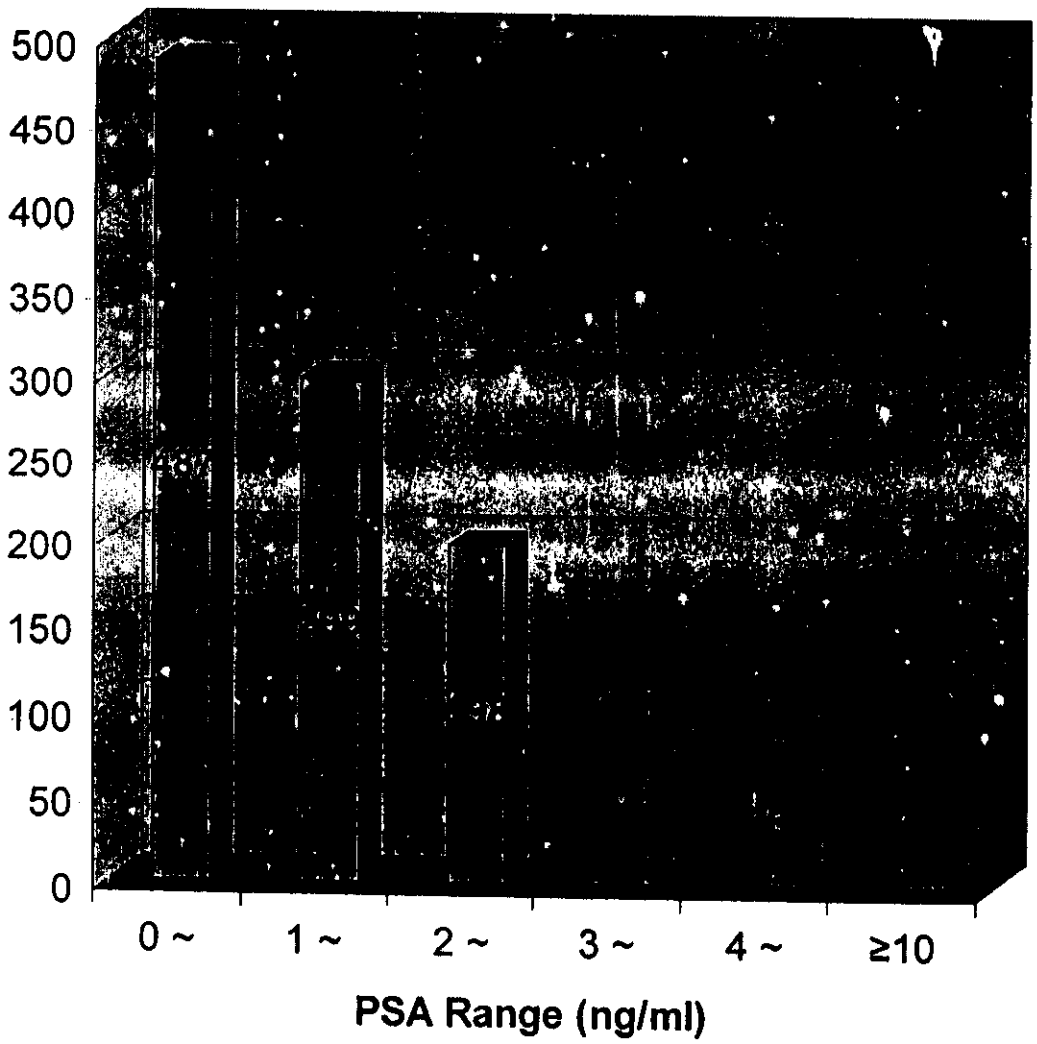

Fig. (20): PSA ranges of the studied group

Table (10): PSA according to age.

Age \ PSA	PSA≥ 4 ng/ml		PSA< 4 ng/ml		Mean ± SD	Range	ANOVA	
	No	%	No	%			F	Pvalue
50~ n= 581	21	3.6	560	96.4	1.5 ± 1.6	0.1 – 21	13.6	<0.05
60~ n= 471	49	10.4	422	89.6	2.06 ±2.1	0.1 – 9.2		
≥70 n= 122	17	13.9	105	86.1	2.2 ±3.2	0.1 – 18.6		
Total n= 1174	87	7.4	1087	92.6	1.8 ± 2.02	0.1 – 21		

This table shows that:

There was a statistically significant difference between age groups regarding the mean PSA level (P value < 0.05)

- In the age group from 50 to less than 60 years the mean PSA was 1.5±1.6 ng/ml with a range from 0.1 to 21 ng/ml, 21(3.6%) of them had PSA ≥ 4ng/ml and 560 (96.4%) of them had a PSA <4 ng/ml.
- In the age group from 60 to less than 70 years the mean PSA was 2.06 ± 2.1 with a range from 0.1 to 9.2, 49 (10.4%) of them had PSA ≥4ng/ml and 422 (89.6%) of them had PSA <4 ng/ml.
- In the age group ≥70 years the mean PSA was 2.2 ± 3.2 ng/ml with a range from 0.1 to 18.6,17 (13.9%) of them had PSA ≥4ng/ml and 105 (86.1%) of them had PSA <4 ng/ml.
- In the total screened men the mean PSA was 1.8 ± 2.02 4ng/ml with a range from 0.1 to 21 ng/ml, 87 (7.4%) of them had PSA ≥4ng/ml and 1087 (92.6%) had PSA <4ng/ml.

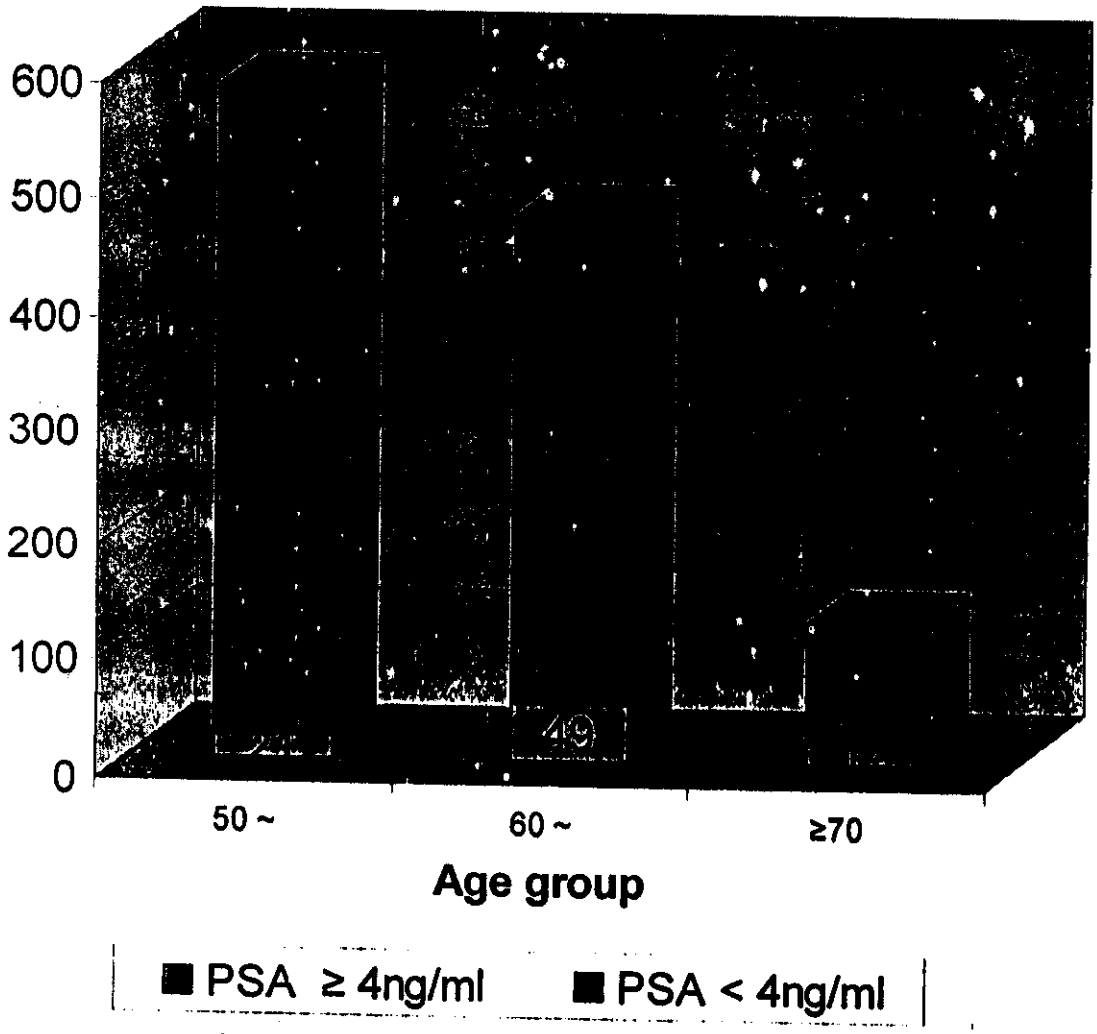

Fig. (21): PSA according to age

Table (11): The relation between PSA and DRE.

PSA / DRE	≥4ng/ml		<4ng/ml		Mean ± SD	Range	t	P value
	No	%	No	%				
+ve DRE n=90	24	27.6	66	6.1	3.5 ± 3.7	0.2 - 19.2	8.6	<0.05
-ve DRE n=1084	63	72.4	1021	93.9	1.6 ± 1.8	0.1 -21		
Total n=1174	87	7.4	1087	92.6	1.8 ± 2.02	0.1 – 21		

This table shows that:

There was a statistically significant difference between PSA and presence of abnormalities by DRE (*t* test = 8.6, P value <0.05).

- The number of men that had PSA ≥4 ng/ml was 87 men accounted for 7.4% of the all screened men, 24 (27.6%) of them had an abnormal DRE and 63(72.4%) of them were normal by DRE.
- The number of men that had PSA <4 ng/ml was 1087 men accounted for 92.6% of the all screened men, 66 (6.1%) of them had an abnormal DRE and 1021 (93.9%) of then were normal by DRE.
- The mean PSA of the men that had an abnormal DRE was 3.5 ± 3.7 ng/ml with a range from 0.2 to 19.2 ng/ml.
- The mean PSA of the men that had normal DRE was 1.6 ± 1.8 ng/ml with a range from 0.1 to 21 ng/ml.

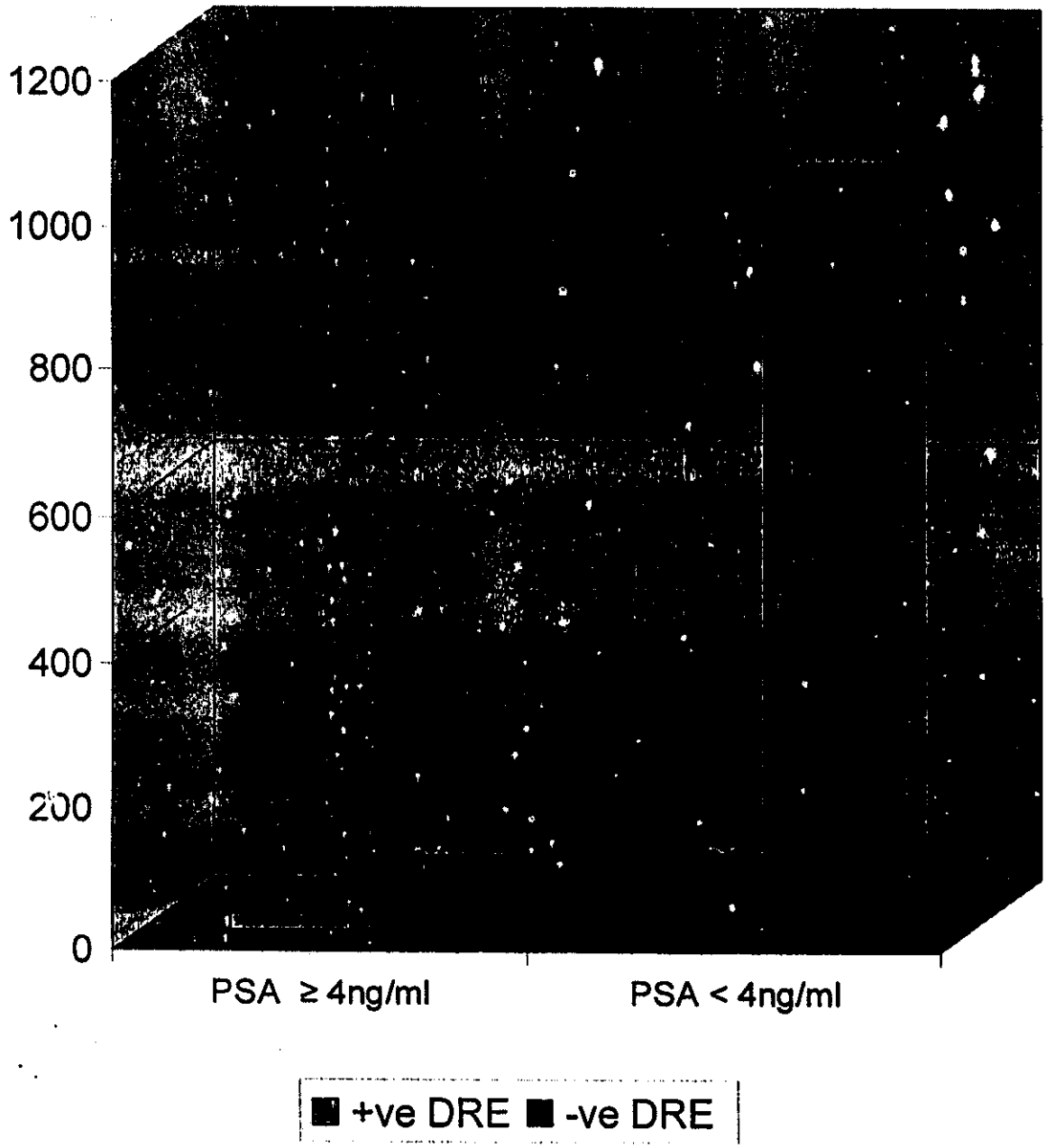

Fig. (22): The relation between PSA and DRE

Table (12): DRE according to age.

DRE / Age group	+ ve DRE		-ve DRE		Total		Chi-Square	P value
	No	%	No	%	No	(%)		
50~	17	2.9	564	97.1	581	49.4	150.7	< 0.05
60~	30	6.4	441	93.6	471	41		
≥70	43	35.2	79	64.8	122	10.6		
Total	90	7.6	1084	92.4	1174	100		

This table shows that:

There was a statistically significant difference in each age group regarding the presence of abnormalities by DRE (χ^2 = 150.7, P value <0.05).

- The total number of screened men was1174 men 90 (7.6%) of them had an abnormal DRE and 1084 (92.4%) of them were normal by DRE.
- In the age group from 50 to to less than 60 years, there were 581 men, 17 (2.9%) of them had an abnormal DRE and 564 (97.1%) of them were normal by DRE.
- In the age group from 60 to to less than 70 years, there were 471 men, 30 (6.4%) of them had an abnormal DRE and 441 (93.6%) of them were normal by DRE.

- In the age group from 70 years and older, there were 122 men, 43 (35.2%) of them had an abnormal DRE and 79 (64.8%) of them were normal by DRE.

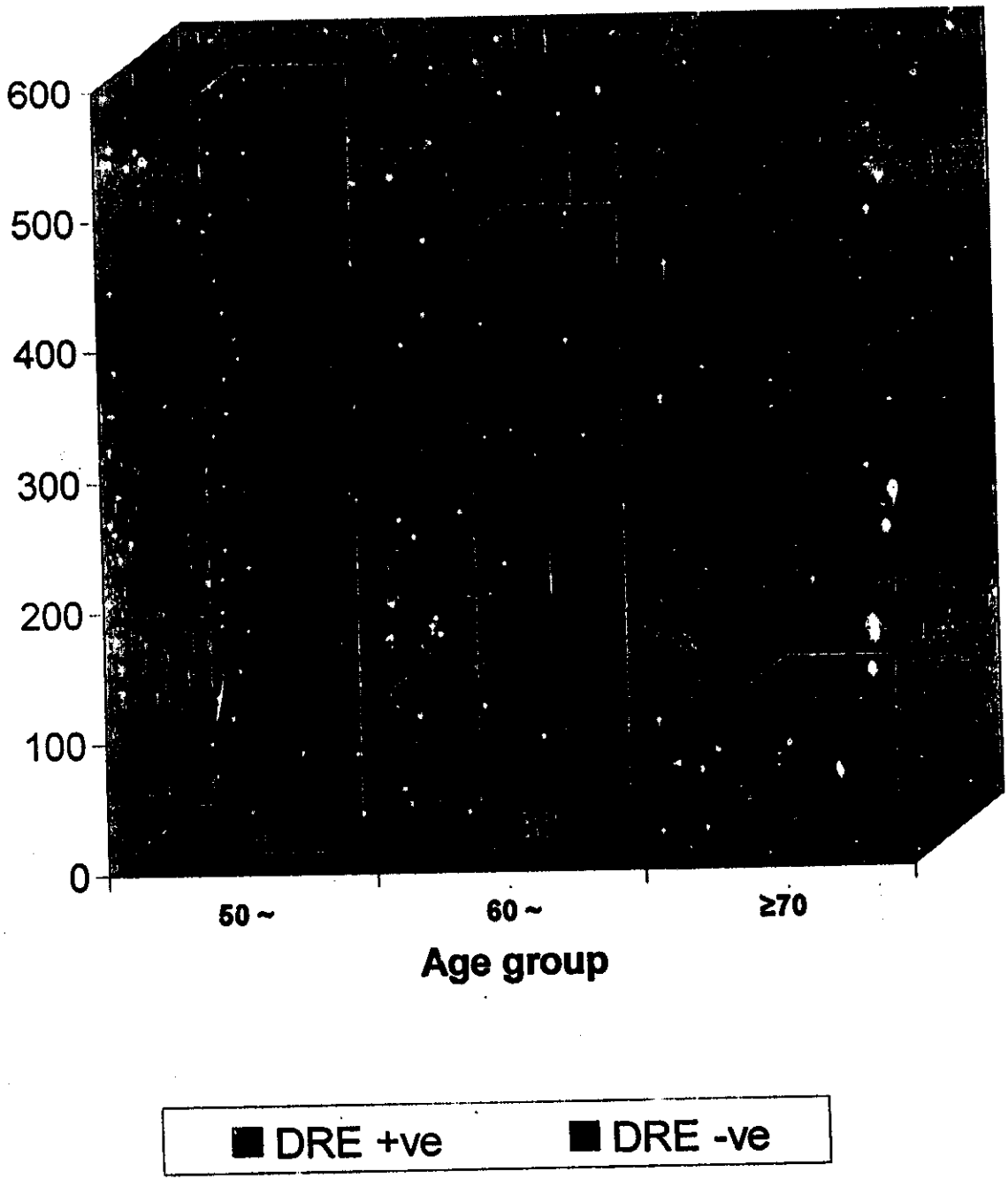

Fig. (23): DRE according to age.

Table (13): Criteria of cases that underwent TRUS examination and biopsy.

PSA / DRE	+ ve DRE		- ve DRE		Total	
	No.	%	No.	%	No.	%
PSA ≥ 4ng/ml	24	26.7	63	100	87	56.9
PSA <4ng/ml	66	73.3	0	0	66	43.1
Total	90	100	63	100	153	100

- This table shows that there were 153 cases underwent TRUS examination and biopsy ,out of them 63 men had only PSA ≥ 4ng/ml , 66 men had only abnormalities in DRE and 24 men had both abnormalities in DRE and PSA ≥ 4ng/ml

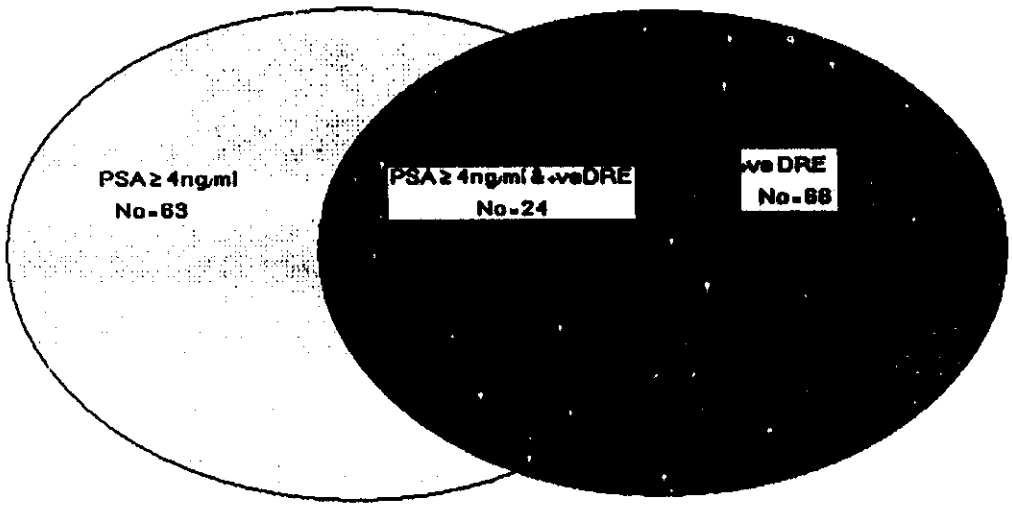

*Fig. (24): **Criteria of cases that underwent TRUS examination and biopsy.***

Table (14): Types of lesions by TRUS in suspicious cases

	No	(%)
No lesion	**84**	54.9
Hypoechoic lesion	**44**	28.8
Isoechoic lesion	**18**	11.7
Hyperechoic lesion	7	4.6
Total	**153**	100

This table shows:

- There were 84 cases without lesion inTRUS examination accounted for 54.9% of the all examined cases
- There were 44 cases with hypoechoic lesion inTRUS examination accounted for 28.8% of the all examined cases
- There were 18 cases with isoechoic lesion in TRUS examination accounted for 11.7 % of the all examined cases
- There were 7 cases with hyperechoic lesion in TRUS examination accounted for 4.6 % of the all examined cases.

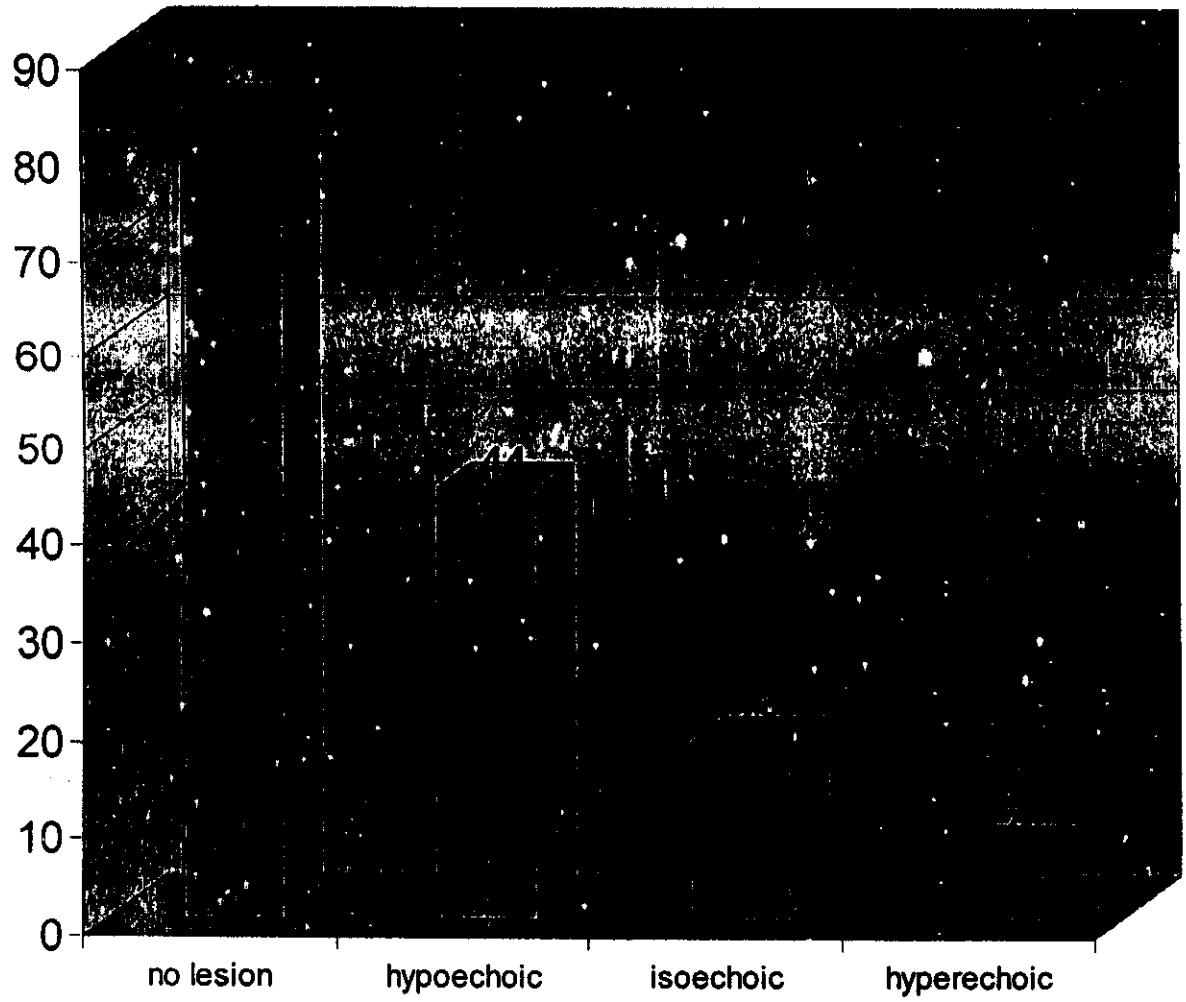

Fig. (25): Types of lesion by TRUS in suspicious cases

Table (15): PSA and types of lesion detected by TRUS.

PSA / TRUS	≥4ng/ml		<4ng/ml		Mean ± SD	Range	ANOVA	
	No.	%	No.	%			F	P value
No lesion n=84	45	53.6	39	46.4	4.4 ± 2.6	1 - 9.8	6.04	<0.05
Hypoechoic n=44	31	70.5	13	29.5	6.9 ± 5.4	0.2 - 21		
Isoechoic n=18	9	50	9	50	3.4 ± 2.8	0.3 - 8		
Hyperechoic n=7	2	28.6	5	71.4	3.9 ± 1.9	2.1 - 8		
Total n= 153	87	56.9	66	43.1	4.9 ± 3.8	0.2 - 21		

This table shows that:

There was a statistically significant difference between results of TRUS examination (lesion types) and mean PSA level (P value <0.05).

- There were 153 cases underwent TRUS examination,87 (56.9%) of them had PSA ≥4 ng/ml , and 66 (43.1) %of them had PSA <4 ng/ml. The mean PSA of them was 4.9 ± 3.8 ng/ml with a range of 0.2-21 ng/ml
- There were 84 cases showed no lesion by TRUS, 45 (53.6%) of them had PSA ≥4 ng/ml ,and 39 (46.4%) of them had PSA <4 ng/ml. The mean PSA of them was 4.4 ± 2.6 ng/ml with a range of 1-9.8 ng/ml.
- There were 44 cases showed hypoechoic lesion by TRUS, 31 (70.5%) of them had PSA ≥4 ng/ml 13 (29.5%) of them had PSA <4 ng/ml.The mean PSA of them was 6.9 ± 5.4 ng/ml with a range of 0.2-21 ng/ml.

- There were 18 cases showed hypoechoic lesion by TRUS, 9 (50%) of them had PSA ≥4 ng/ml and 9 (50 %) of them had PSA <4 ng/ml.The mean PSA of them was 3.4± 2.8 ng/ml with a range of 0.3 - 8 ng/ml.
- There were 7 cases showed hyperechoic lesion by TRUS, 2 (28.6) of them had PSA ≥4 ng/ml and 5 (71.4 %) of them had PSA <4 ng/ml. The mean PSA of them was 3.9 ± 1.9ng/ml with a range of 2.1-8 ng/ml.

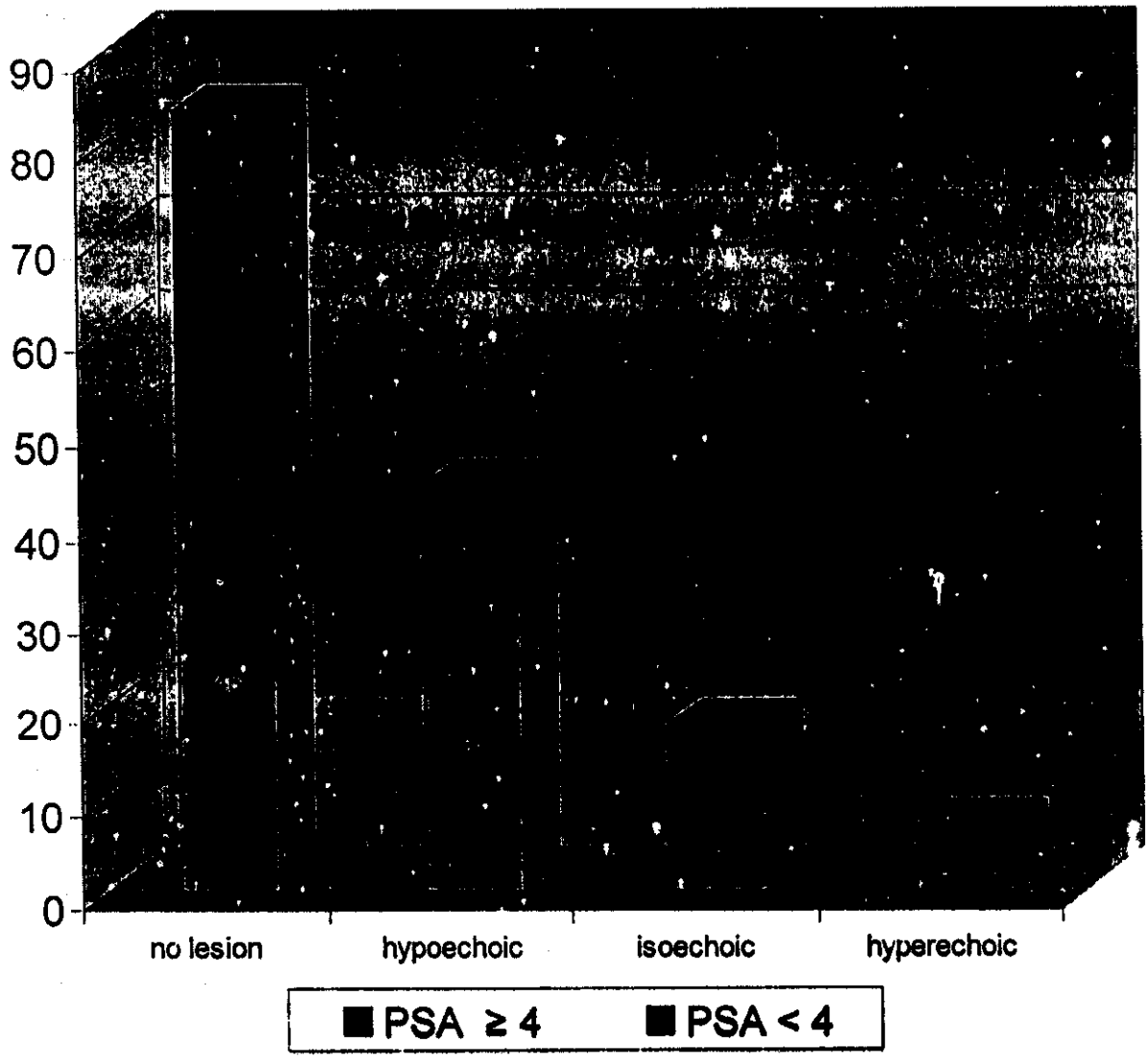

Fig. (26): PSA and type of lesion by TRUS

Table (16): DRE and types of lesion detected by TRUS.

DRE / TRUS	+ve DRE		-ve DRE		Total		Chi-square	P value
	No	(%)	No	(%)	No	(%)		
No lesion	52	62	32	38	84	54.9	1.4	>0.05
Hypoechoic	22	50	22	50	44	28.8		
Isoechoic	11	61.1	7	38.9	18	11.7		
Hyperechoic	5	71.4	2	28.6	7	4.6		
Total	90	58.8	63	41.2	153	100		

There was statistically insignificant difference between results of TRUS examination (lesion types) and presence of abnormalities by DRE (X^2 = 1.4, P value = >0.05).

- There were 84 cases revealed no lesion by TRUS, 52 (62%) of them had abnormal DRE and 32 (38%) of them were normal by DRE.
- There were 44 cases revealed hypoechoic lesion by TRUS, 22 (50%)of them had abnormal DRE and 22 (50%) of them were normal by DRE.
- There were 18 cases revealed isoechoic lesion by TRUS, 11 (61.1%) of them had abnormal DRE and 7 (38.9%) of them were normal by DRE.

- There were 7 cases revealed hyperechoic lesion by TRUS, 5 (71.4%) of them had abnormal DRE and 2 (28.6%) of them were normal by DRE.

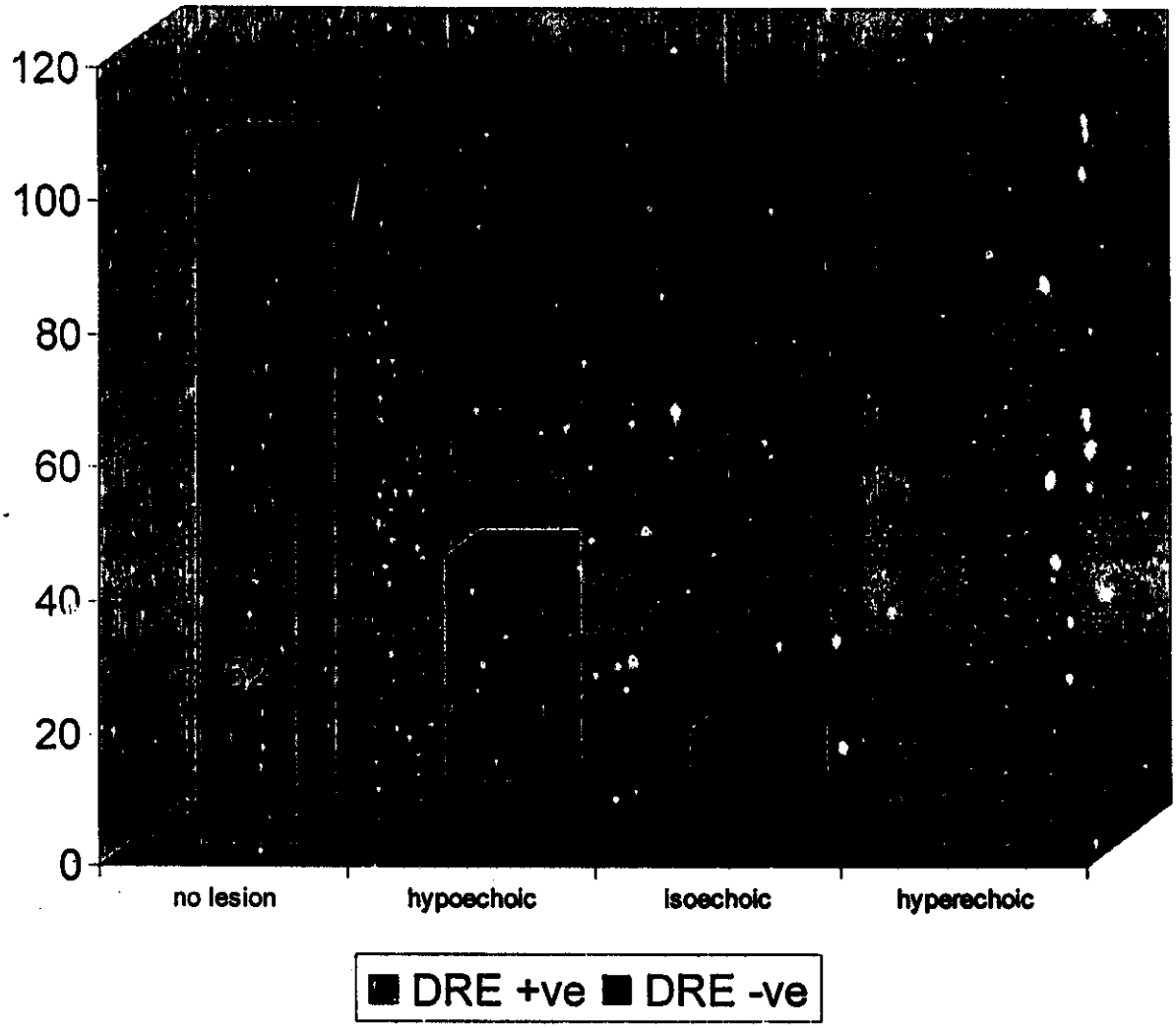

Fig. (27): DRE and type of lesion by TRUS

Table (17): Lesion types by TRUS and presence of prostate cancer

Cancer / TRUS	Cancer		No cancer		Total		Chi square	P value
	No	%	No	%	No	%		
No lesion	8	9.5	76	90.5	84	55	4.4	<0.05
Hypoechoic	11	25	33	75	44	28.7	4.8	<0.05
Isoechoic	4	22.2	14	77.8	18	11.8	0.8	>0.05
Hyperechoic	0	0	7	100	7	4.5		
Total	23	100	130	100	153	100		

- Out of the 84 cases that revealed no lesion by TRUS 8 (9.5%) diagnosed as prostate cancer and 76 (90.5%) revealed no cancer, this difference was statistically significant ($\chi 2 = 4.4$, P value <0.05)
- Out of the 44 cases that revealed hypoechoic lesion by TRUS 11(25 %) diagnosed as prostate cancer and 33 (75 %) revealed no cancer, this difference was statistically significant ($\chi 2 = 4.8$, P value <0.05)
- Out of the 18 cases that revealed isoehoic lesion by TRUS 4 (22.2%) diagnosed as prostate cancer and 14 (77.8%) revealed no cancer , this difference was statistically insignificant ($\chi 2 = 0.8$, P value >0.05).
- There were 7 cases that revealed hyperechoic lesion by TRUS non of them were diagnosed as prostate cancer.

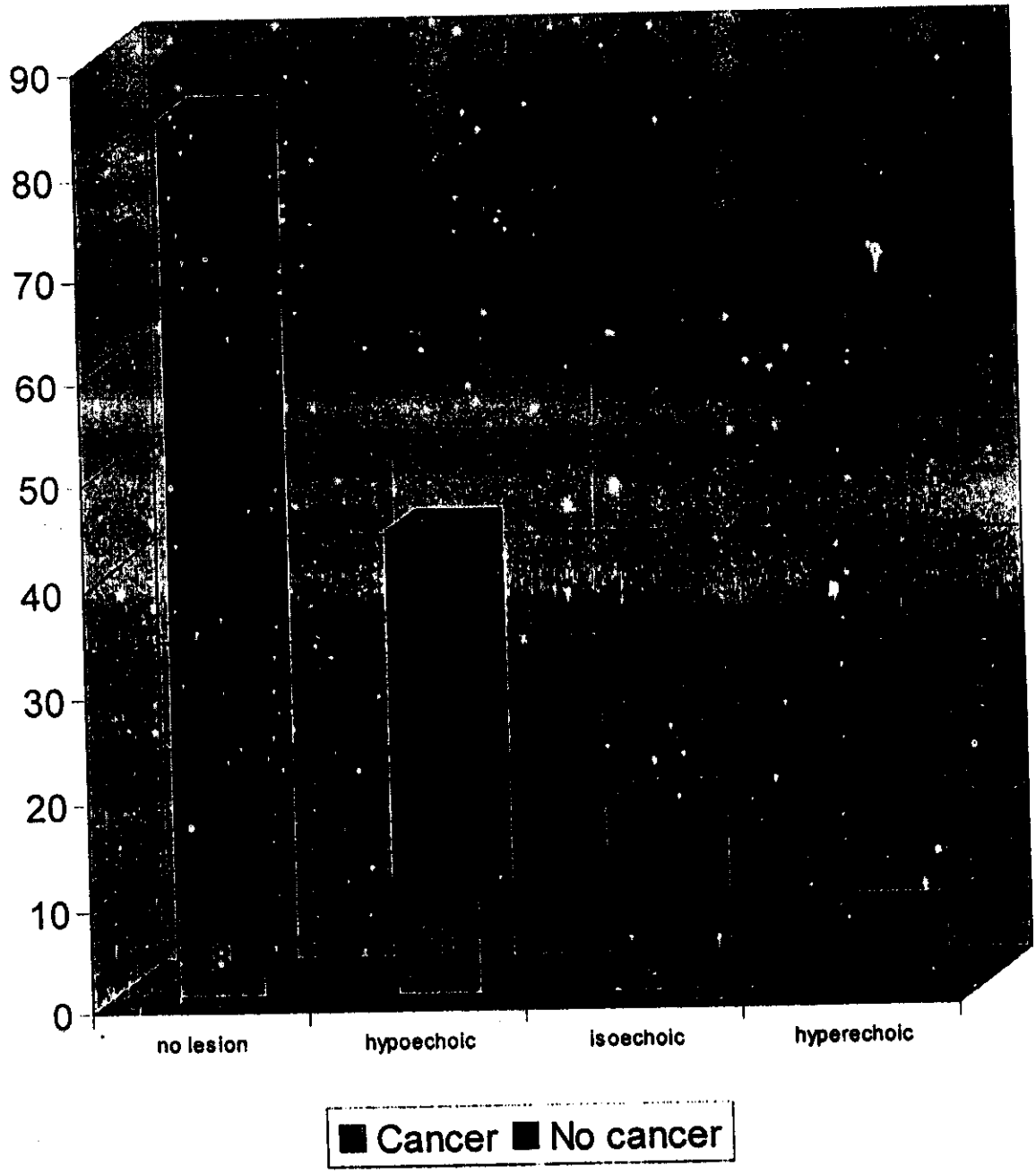

Fig. (28): Lesion types by TRUS and presence of prostate cancer

Table (18): Sensitivity and specificity of TRUS in detection of prostate cancer

Cancer / TRUS	*Positive*		*Negative*		*Total*	
	No.	*%*	*No.*	*%*	*No.*	*%*
+ve TRUS	**15**	65.2	**54**	41.5	**69**	45
-ve TRUS	**8**	34.8	**76**	58.5	**84**	55
Total	**23**	100	**130**	100	**153**	100

$$\text{So, Sensitivity} = \frac{\textbf{True-positive results}}{\textbf{True-positive results + False negative results}} = \textbf{X 100}$$

$$\text{Sensitivity} = \frac{15}{15+8} \text{ X } 100 = 65.2\ \%$$

$$\text{Specificity} = \frac{\textbf{True-negative results}}{\textbf{True-negative results + False positive results}} = \textbf{X 100}$$

$$\text{Specificity} = \frac{76}{76+54} \text{ X } 100 = 58.5\ \%$$

Table (19): Sensitivity and specificity of PSA density (PSAD) cutoff (0.15) in detection of prostate cancer among cases with PSA in the range of 4-10 ng/ml (n = 76).

Cancer / PSAD	*Positive*		*Negative*		*Total*	
	No.	*%*	*No.*	*%*	*No.*	*%*
> 0.15	**10**	66.7	**15**	24.6	**25**	32.9
< 0.15	**5**	33.3	**46**	75.4	**51**	67.1
Total	**15**	100	**61**	100	**76**	100

$$\text{Sensitivity} = \frac{\text{True-positive}}{\text{True-positive results + False negative results}} = \mathbf{X\ 100}$$

$$\text{Sensitivity} = \frac{10}{10 + 15} \text{ X } 100 = 66.6\ \%$$

$$\text{Specificity} = \frac{\text{True-negative}}{\text{True-negative results + False positive results}} = \mathbf{X\ 100}$$

$$\text{Specificity} = \frac{46}{15 + 46} \text{ X } 100 = 75.4\ \%$$

Table (20): Sensitivity and specificity of PSA transition zone density (PSATZ) cutoff (0.35) in detection of prostate cancer among cases with PSA in the range of 4-10 ng/ml (n = 76).

Cancer / PSATZ	Positive		Negative		Total	
	No.	%	No.	%	No.	%
> 0.35	12	80	17	27.9	29	38.2
< 0.35	3	20	44	72.1	47	61.8
Total	15	100	61	100	76	100

$$\text{Sensitivity} = \frac{\text{True-positive}}{\text{True-positive results + False negative results}} \times 100$$

$$\text{Sensitivity} = \frac{12}{12 + 3} \times 100 = 80\ \%$$

$$\text{Specificity} = \frac{\text{True-negative}}{\text{True-negative results + False positive results}} \times 100$$

$$\text{Specificity} = \frac{44}{44 + 17} \times 100 = 72.1\ \%$$

Table (21): Complications of TRUS guided biopsy.

Complication	*No*	*%*
Hematuria	62	40.5
Hematospermia	41	26.8
Dysuria	26	16.9
Urinary retention	9	5.9
Rectal bleeding	2	1.3

This table shows the complications of TRUS guided biopsy.

- 62 cases had hematuria accounted for 40.5% of all cases that underwent TRUS examination and biopsy.
- 41cases had hematospermia accounted for 26.8% of all cases that underwent TRUS examination and biopsy.
- 26 cases had dysuria accounted for 16.9% of all cases that underwent TRUS examination and biopsy
- 9 cases had urinary retention accounted for 5.9% of all cases that underwent TRUS examination and biopsy.
- 2 cases had rectal bleeding accounted for 1.3% of all cases that underwent TRUS examination and biopsy.

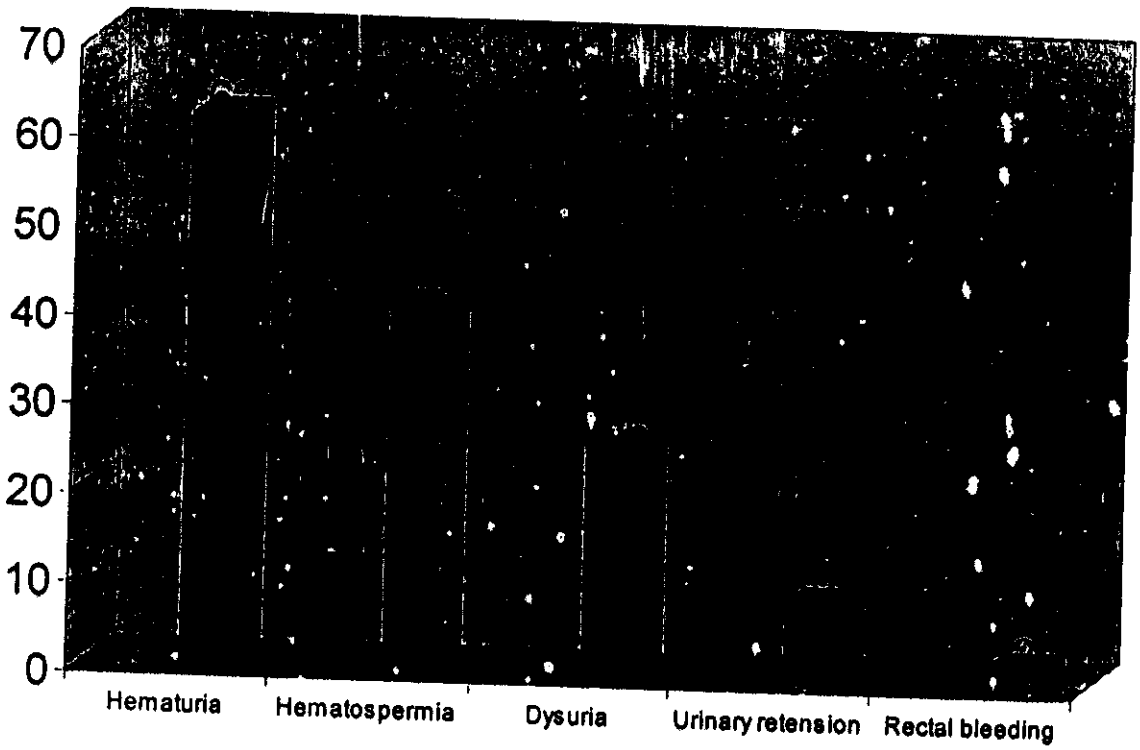

Fig. (29): Complications of TRUS guided biopsy.

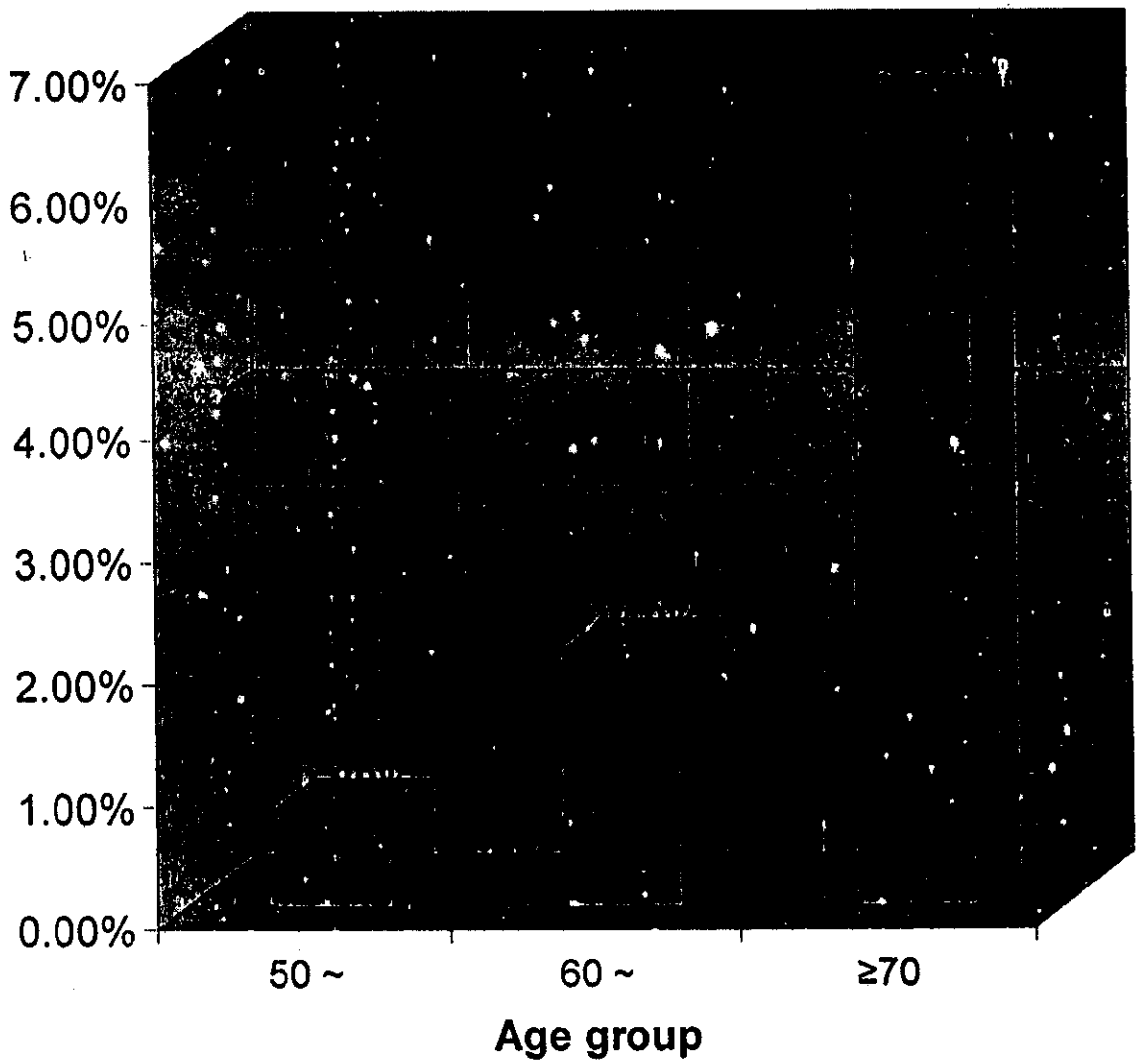

Fig. (31): Cancer detection rate according to age group.

Table (24): PSA and prostate cancer

PSA / Cancer	PSA							
	≥4ng/ml		<4ng/ml		Mean ± SD	Range	t	P value
	No	(%)	No	(%)				
Cancer n= 23	20	87	3	13	8 ± 4.6	3 - 21	5.3	<0.05
No cancer n= 130	67	51.5	63	48.5	4.3 ± 3.3	0.2 - 18.6		
Total n= 153	87	56.9	66	43.1	4.9 ± 3.8	0.2 - 21		

This table shows:

- Cases with prostate cancer diagnosed by TRUS guided biopsy show statistically significant higher mean PSA value (8 ± 4.6) than those that showed no cancer (4.3 ± 3.3), (*t* test = 5.3 , P value <0.05).
- Out of the 23 cases that was diagnosed as prostate cancer, 20 (87%) cases had PSA ≥ 4ng/ml and 3 (13%) case had PSA <4 ng/ml.
- Out of the 130 cases that revealed no prostate cancer 67 (51.5%) had PSA ≥ 4ng/ml and 63 (48.5%) had PSA <4 ng/ml.

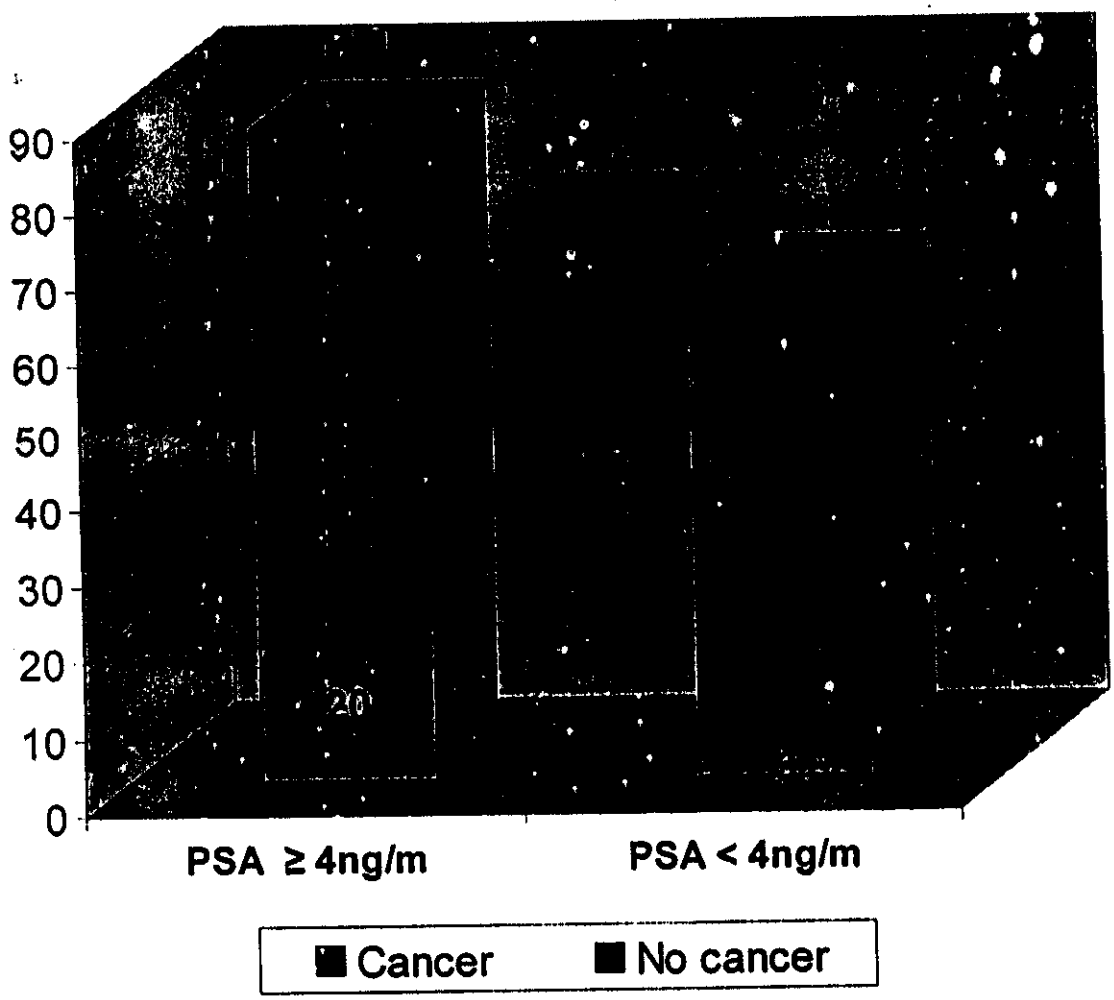

Fig. (32): PSA and cancer prostate

Table (25): Sensitivity and specificity of PSA in detection of prostate cancer at cutoff point 4 ng/ml

Cancer / PSA	Positive		Negative		Total	
	No.	%	No.	%	No.	%
PSA ≥4ng/ml	20	87	67	51.5	87	56.9
PSA< 4ng/ml	3	13	63	48.5	66	43.1
Total	23	100	130	100	153	100

$$\text{So, Sensitivity} = \frac{\text{True-positive results}}{\text{True-positive results + False negative results}} = \text{X } 100$$

$$\text{Sensitivity} = \frac{20}{20 + 3} \text{ X } 100 = 86.9\ \%$$

$$\text{Specificity} = \frac{\text{True-negative results}}{\text{True-negative results + False positive results}} = \text{X } 100$$

$$\text{Specificity} = \frac{63}{63+67} \text{ X } 100 = 48.5\ \%$$

Table (26): DRE and prostate cancer.

DRE / Cancer	+ve DRE		-ve DRE		Total		Chi-square	P value
	No	(%)	No	(%)	No	(%)		
Cancer	14	60.9	9	39.1	23	15	0.05	>0.05
No cancer	76	58.5	54	41.5	130	85		
Total	90	58.8	63	41.2	153	100		

This table shows:

- There was statistically insignificant difference between the presence of prostate cancer diagnosed by TRUS guided biopsy and the presence of abnormalities by DRE ,($\chi 2$ =0.05,P value > 0.05)
- Out of the 23 cases that revealed prostate cancer 14 (60.9%) of them had abnormal DRE and 9 (39.1%) of them were normal by DRE.
- Out of the 130 cases that revealed no cancer 76 (58.5%) of them had abnormal DRE and 54 (41.5%) of them were normal by DRE.

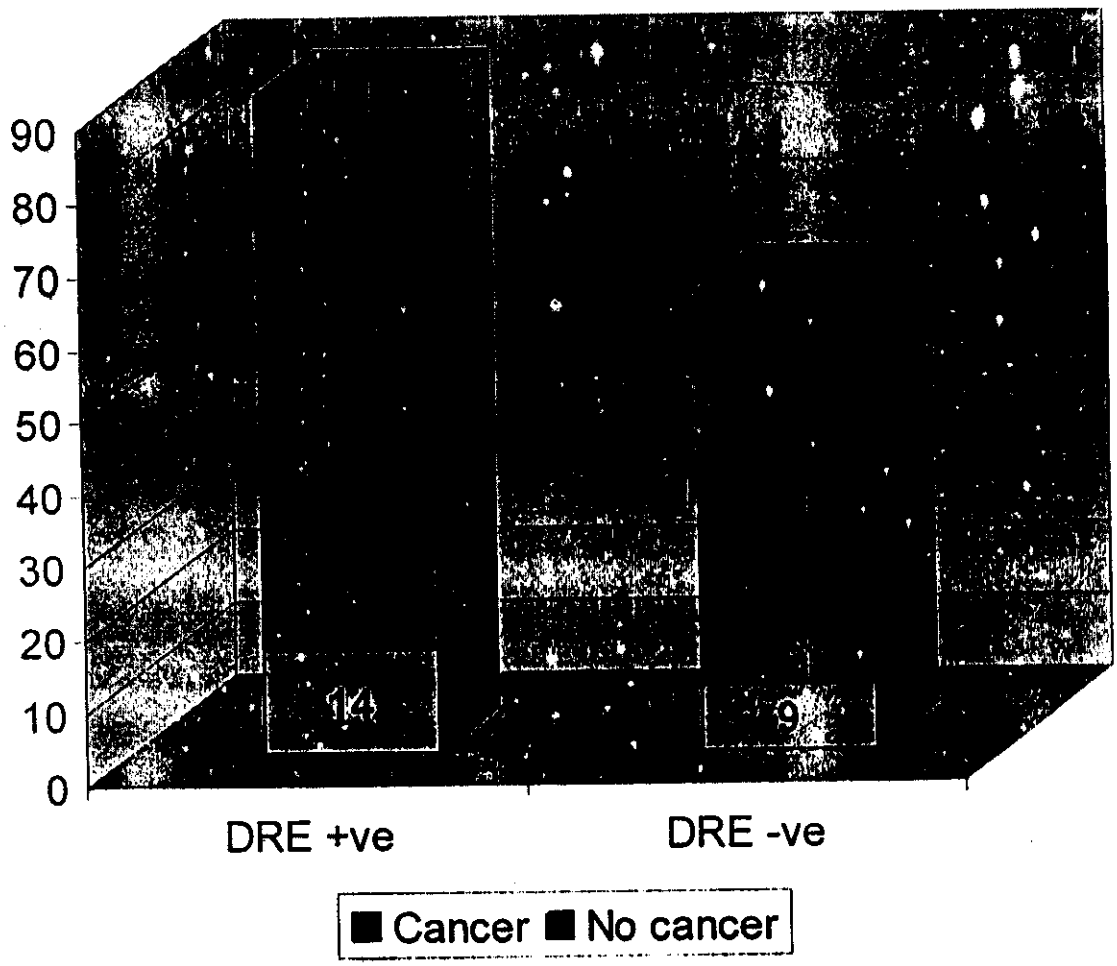

Fig. (33): DRE and cancer prostate

Table (27): Sensitivity and specificity of DRE in detection of prostate cancer

Cancer / DRE	Positive		Negative		Total	
	No.	%	No.	%	No.	%
+ve DRE	14	60.8	76	58.5	90	58.8
-ve DRE	9	39.2	54	41.5	63	41.2
Total	23	100	130	100	153	100

$$\text{Sensitivity} = \frac{\text{True-positive results}}{\text{True-positive results + False negative results}} = X\ 100$$

$$\text{Sensitivity} = \frac{14}{14 + 9} X\ 100 = 60.8\ \%$$

$$\text{Specificity} = \frac{\text{True-negative results}}{\text{True-negative results + False positive results}} = X\ 100$$

$$\text{Specificity} = \frac{54}{54 + 76} X\ 100 = 41.5\%$$

The pathological diagnosis of the 23 cases of prostate cancer was adenocarcinoma.

Table (28): PSA according to Gleason sum of the prostate cancer.

PSA / Gleason Sum	No	%	Mean ± SD	Range	ANOVA	
					F	P value
5	10	43.5	6.5 ± 1.6	3 - 8.9	7.07	<0.05
6	7	30.5	7.08 ± 3.1	3.2 –12		
7	5	21.7	12.4 ± 5.9	7 – 21		
8	1	4.3	19.2			
Total	23	100	8.5 +4.6	3 – 21		

This table shows that:

- There was a statistically significant difference between Gleason sum of the diagnosed prostate cancer and the mean PSA level (P value <0.05)
- Ten cases (43.5%) of prostate cancer had Gleason sum "5" and their mean PSA was 6.5 ± 1.6 ng/ml with a range from 3 to 8.9 ng/ml
- Seven cases (30.5.%) of prostate cancer had Gleason sum "6" and their mean PSA was 7.08 ± 3.1 ng/ml with a range from 3.2 to 12 ng/ml
- Five cases (21.7 %) of prostate cancer had Gleason sum "7" and their mean PSA was 12.4 ± 5.9 ng/ml with a range from 7 to 21 ng/ml.
- One case of cancer had Gleason sum "8" and its PSA was 19.2 ng/ml.

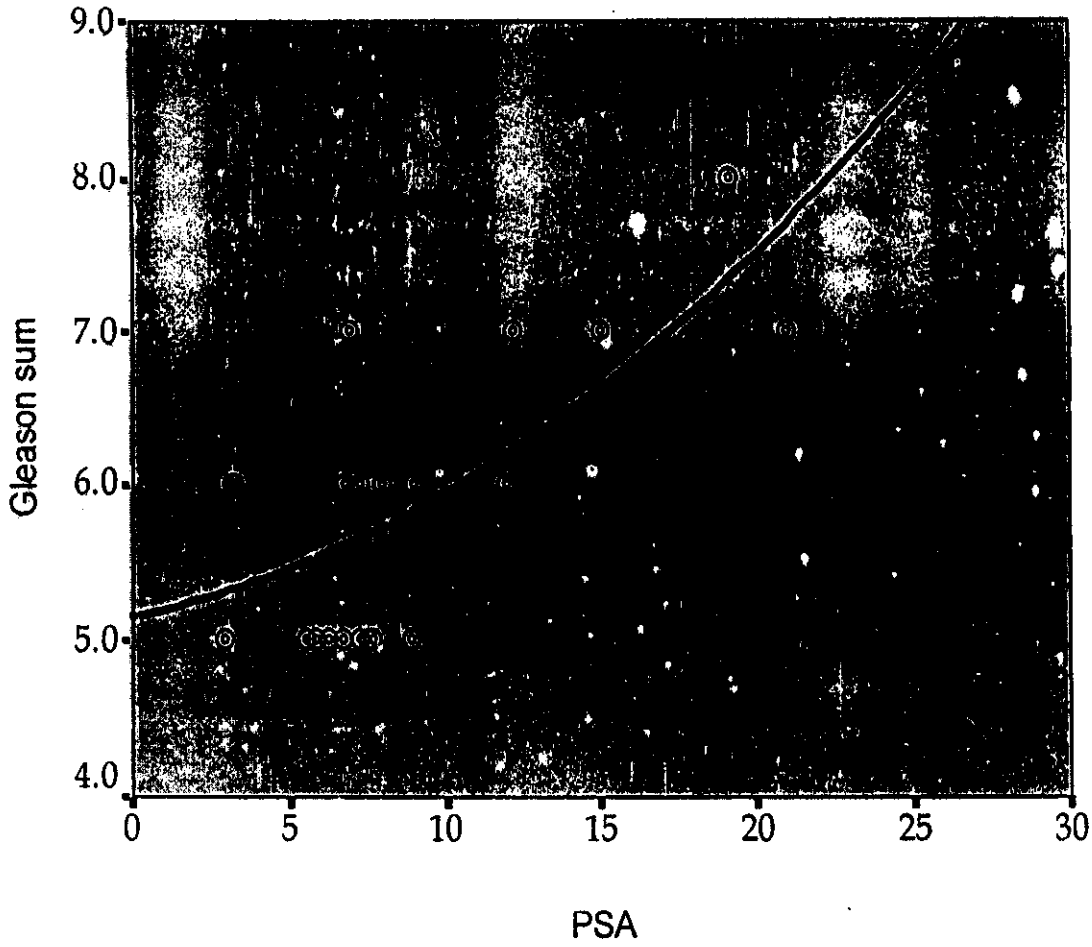

Fig. (34):Scatter plot curve shows the direct positive correlation between PSA and Gleason sum of prostate cancer (r =0.65. P value<0.05)

Table (29): DRE according to Gleason sum of the prostate cancer

DRE / Gleason sum	+ve DRE		-ve DRE		Total		Chi-Square	P value
	No	%	No	%	No	(%)		
5	3	30	7	70	10	43.5	7.2	> 0.05
6	6	85.7	1	14.3	7	30.5		
7	4	80	1	20	5	21.7		
8	1	100			1	4.3		
Total	14	60.9	9	39.1	23	100		

There was a statistically insignificant diffrernce between presence of abnormalities in DRE and Gleason sum of the diagnosed prostate cancer ($\chi^2 = 7.2$, P value >0.05).

- Ten cases of prostate cancer had Gleason sum "5", 3(30%) of them had abnormal DRE and 7 (70%) of them were normal by DRE.
- Seven cases of prostate cancer had Gleason sum "6", 6 (85.7 %) of them had abnormal DRE and 1(14.3%) of them was normal by DRE.
- Five cases of prostate cancer had Gleason sum "7", 4 (80%) of them had abnormal DRE and 1 (20%) of them was normal by DRE.
- One case had a Gleason sum "8" and was abnormal by DRE

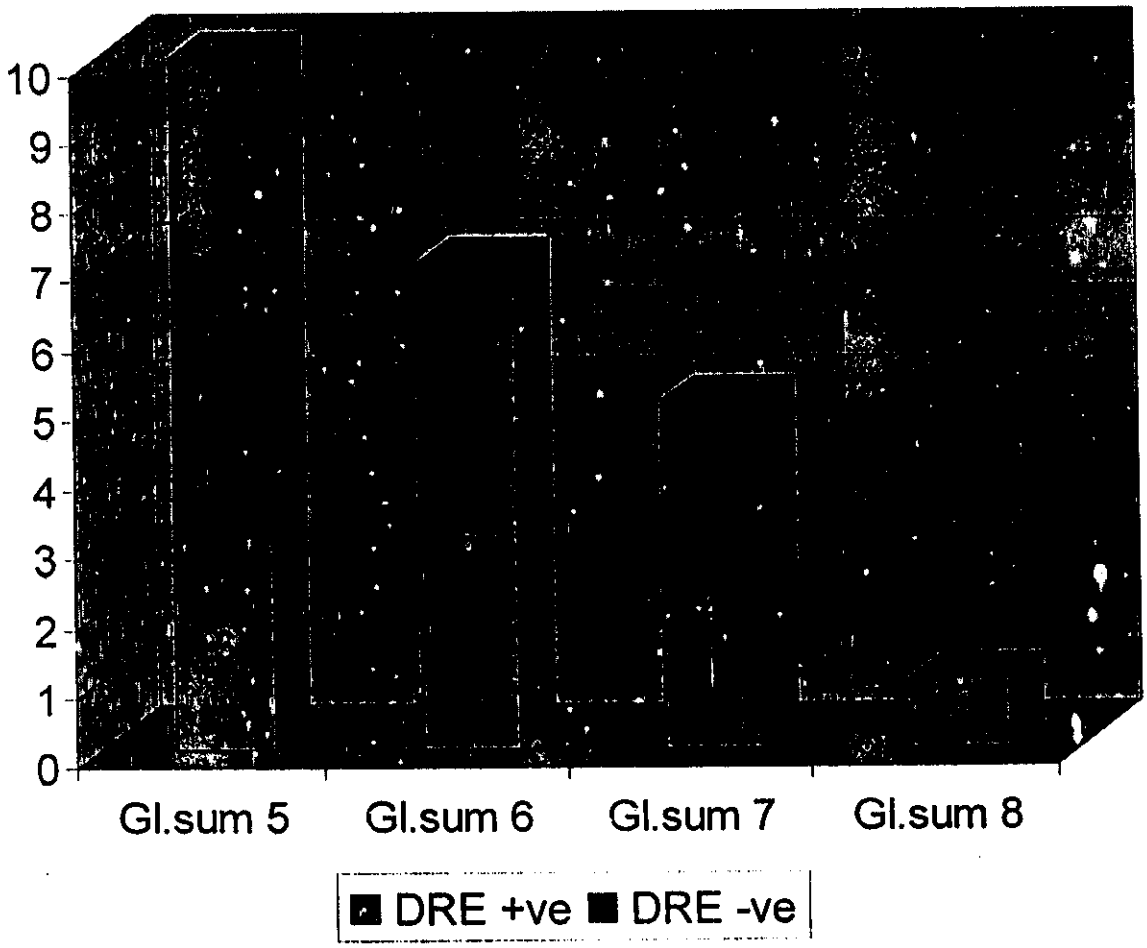

Fig. (35): DRE according to Gleason sum of the prostate cancer

Fig. (36): Prostatic adenocarcinoma , Gleason sum 6 (3+3)

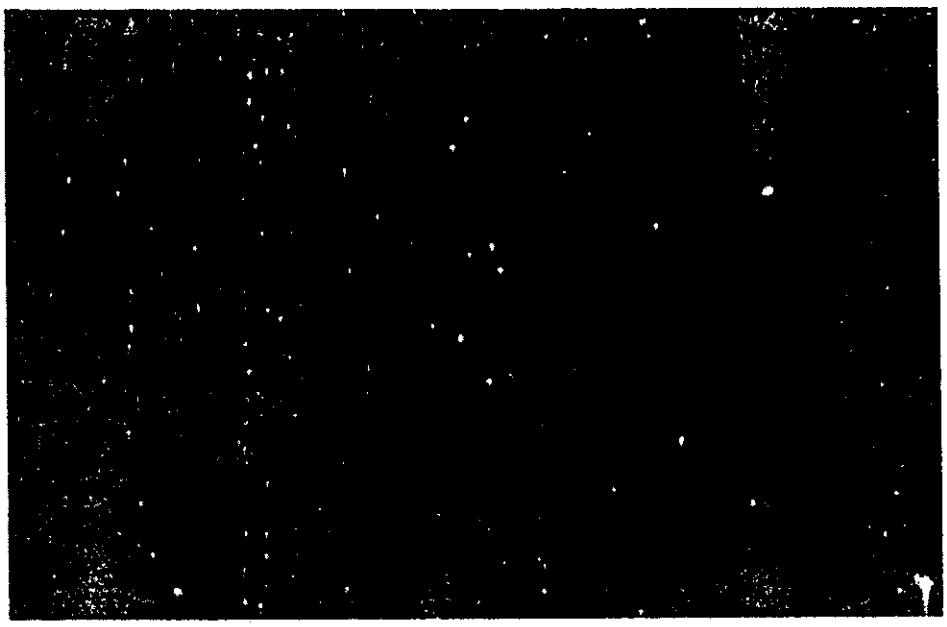

Fig. (37): Prostatic adenocarcinoma , Gleason sum 7 (3+4)