

RESULTS

Using the strict criteria of sperm morphology evaluation (*Kruger et al., 1987*), 70 semen samples analysis were performed, the age of patients with leukocytospermia ranged between 21 and 42 years (*) (mean 33.35 ± 3.36) and the control group ranged between 29 and 45 years (mean 34.46 ± 4.96). The difference was not statistically significant. Minimum duration of infertility for patients with leukocytospermia was 1.5 and maximum was 12 years, (mean 4.36 ± 2.73).

The semen volume in the group with leukocytospermia ranged from 0.5 to 6 ml, (mean 3.49 ± 1.29), while count ranged from 5 to 120 million/ml, (mean 27.19 ± 20). The percentage of motility ranged from 5 to 60%, (mean 26.44 ± 15.42), in the control group, the semen volume ranged from 2.5 to 6 ml, mean (4.46 ± 1.21), count ranged from 22 to 70 million /ml, (mean 41.69 ± 16.19) while the percentage of motility ranged from 40 to 70%, (mean 55 ± 10.80). Since we selected cases with leukocytospermia and abnormal semen count and motility, no comparison between leukocytospermia and control group was done. Concerning abnormal forms in semen samples of control group, the percentage of normal forms ranged from 17 to 51, (mean 28.46 ± 9.55), while in men with leukocytospermia, the percentage ranged from 10 to 35, (mean 20.51 ± 6.82). This has achieved statistical significance ($P = .0003$). Table (4).

(*) (mean $\pm$ SD).

Table (4) : Semen parameters in the leukocytospermia and control groups.

Parameters	Leukocytospermia n = 57	Control n = 13	t	p
Volume (Mean $\pm$ S.D)	3.49 ($\pm$ 1.29)	4.46($\pm$ 1.21)		
Count	27.19 ($\pm$ 20)	41.69($\pm$ 16.19)		
Motility	26.44 ($\pm$ 15.42)	55 ($\pm$ 10 .80)		
Normal sperm	20.51 ($\pm$ 6.02)	28.46 ($\pm$ 9.55)	.997	.3319

Taking $> 14\%$ normal sperm morphology as a threshold for fertility, 13 form 57 (23%) patients with leukocytospermia had $\leq 14\%$ normal sperm morphology, on the other hand, all patients in the control group had morphology $> 14\%$. However this difference did not reach a statistical significance ($P > 0.05$). This may be due to small number of control group (Table 5).

Table (5) : Total normal sperm between the leukocytospermia and control groups.

	<i>Leukocytospermia</i>	<i>Control</i>
Normal sperm $\geq 14\%$	44	13
Normal sperm $< 14\%$	13	0

$$\chi^2 = 0.3069$$

$$p > 0.05$$

The total number of total head abnormalities was higher in patients with leukocytospermia (mean 63.49 ± 7.48 range 51 to 82%). While control group (mean 52.62 ± 8.42 range 38 to 70%). There was a significant relationship between the type of sperm head morphology and leukocytospermia. Higher rate of head abnormalities particularly amorphous forms were observed in leukocytospermia groups (mean 26.53 ± 5.67 range 13% to 38%). Versus control group (mean 2.54 ± 4.08 range 13 to 25%). More tapering forms were seen which ranged from (6 to 30%) means (17.26 ± 5.53) versus control group which ranged from (7 to 18%) mean (11.62 ± 3.04). Other anomalies of the sperm head size and duplicate head did not achieve any statistical difference. Table (6).

Table (6) : Comparison of sperm head anomalies in both leukocytospermia and control groups

Parameters	Leukocytospermia n= 57	Control n = 13	t	p
Total Head abnormalities(Mean $\pm$ S.D)	63.49 ($\pm$ 7.48)	52.62 ($\pm$ 8.42)	4.62	*< .0001
Large Head	7.95 ($\pm$ 3.00)	8.39 ($\pm$ 2.82)	.479	.6335
Small Head	8.32 ($\pm$ 3.18)	7.39 ($\pm$ 2 .69)	.977	.3319
Tapering Head	17.26 ($\pm$ 5.53)	11.62 ($\pm$ 3.04)	3.54	*.0007
Amorpheus	26.53 ($\pm$ 5.67)	20.54 ($\pm$ 4.08)	3.59	*.0006
Duplicate	3.44 ($\pm$ 3.12)	4.69 ($\pm$ 1 .78)	1.39	.1688
Loose Head	2.21 ($\pm$ 1.81)	2.54 ($\pm$ 1.76)	2.37	0.2206

* Significant.

The mean teratozoospermia index showed a trend to be higher in patient with leukocytospermia the (mean 1.45 ± 1.208) while control group, (mean 1.36 ± 0.130). Taking > 1.6 TZI as a threshold for fertility in vivo, 11 patients with leukocytospermia showed $\text{TZI} > 1.6$, while all control group (13) showed $\text{TZI} < 1.6$, $P > 0.05$. However this difference did not reach statistical significance due to small number of control groups. (Table 9).

Table (9) : Mean teratozoospermia index in both groups.

Parameters	Leukocytospermia n = 57	Control n = 13	t	p
Teratozoospermia index (TZI) (Mean $\pm$ S.D)	1.45 (± 1.208)	1.36($\pm .130$)	1.47	.1450

Table (10) : TZI in both groups.

	leukocytospermia n	control n
TZI > 1.6	11	0
TZI < 1.6	46	13

$$X^2 = .2097$$

$$p > 0.05$$

When we compared the presence of precursor cells in leukocytospermia patients and control groups, a difference was found with an increase of these cells with leukocytospermia, yet this difference reach a statistical significance, $P > 0.05$. Table (11).

Table (11) : Precursor cells count in leukocytospermia and control groups.

Parameters	Leukocytospermia n= 57	Control n = 13	Totals
Many	6	1	7
Few	36	11	47
Some	15	1	16

$$X^2 = 2.42, \quad p = .2986$$

Table (12) : Strict criteria data of leukocytospermia

sex	age	infD	vol	count	mot.%	pus	specl.	N.S	Tab	L.H	S.H	Tap.H	DH	Adj.	Nile	Tot.H	S.T	C.T	D.T	O.T	T.T	N/M	C.D	L.H	T.Z.I
1	30	3.5	3.5	24	40	20	some	19	81	11	8	13	2	22	25	56	5	16	4	5	30	10	7	0	1.27
2	35	2	4.5	27	5	30	some	20	80	5	6	16	1	27	25	55	7	15	1	4	27	8	7	6	1.21
3	31	5	3	23	50	40	many	16	84	10	5	14	2	30	23	61	6	14	1	4	25	8	4	2	1.1
4	33	7	2	55	30	25	some	13	87	7	5	25	2	35	13	74	3	16	0	3	22	6	4	1	1.22
5	32	1.5	3	22	30	20	few	20	80	5	6	19	3	32	15	65	6	18	4	4	32	18	8	3	1.51
6	34	2	2.5	25	50	15	some	21	79	10	6	13	3	31	16	63	7	6	0	5	18	18	4	2	1.3
7	42	5	5	42	20	12	few	13	87	12	6	15	4	30	20	67	4	10	1	5	20	8	4	3	1.14
8	34	4	2.5	25	50	15	some	26	74	7	5	15	1	29	17	57	16	30	5	11	62	8	4	1	1.7
9	30	8	3	20	30	20	few	23	77	9	4	14	2	34	14	63	2	15	2	8	27	8	2	0	1.3
10	42	1.5	5	42	20	15	few	24	76	10	5	15	3	34	9	67	15	12	0	15	42	10	4	1	1.62
11	37	2	6	55	30	25	some	12	88	8	6	26	4	26	18	70	7	12	7	14	40	16	10	5	1.36
12	35	6	2	23	40	20	few	29	71	9	4	12	0	28	18	53	5	6	8	10	29	7	8	0	1.25
13	39	5	6	5	10	20	few	26	74	7	4	10	2	28	23	51	10	25	0	8	43	8	4	2	1.43
14	35	10	5	7	10	16	few	24	76	8	6	10	2	30	20	56	15	17	6	12	50	10	8	4	1.57
15	30	4	6	18	20	20	few	27	73	12	6	13	0	27	15	58	8	12	0	10	30	9	3	0	1.37
16	32	2	4	10	30	15	few	22	78	8	10	20	0	27	15	68	15	15	7	5	42	12	6	2	1.55
17	36	3	2	75	30	40	few	27	73	4	9	21	2	26	11	62	10	12	2	5	29	17	4	3	1.51
18	31	4	1	16	50	10	few	22	78	12	6	18	0	30	12	66	20	17	4	8	49	13	5	0	1.65
19	32	2	3	12	30	15	few	13	87	15	8	15	4	36	9	78	14	12	6	15	47	20	15	5	1.91
20	32	10	2	13	5	25	many	10	90	14	9	18	4	37	8	82	10	15	0	8	33	10	4	0	1.43
21	33	11	2	45	10	20	few	24	76	10	6	15	2	26	17	59	18	12	4	5	39	14	6	0	5.1
22	34	5	2.5	55	10	15	few	26	74	4	10	14	2	30	14	60	18	10	2	10	40	14	4	4	1.59
23	26	4	3	25	20	12	few	23	77	12	4	20	3	27	11	66	10	14	3	8	35	12	8	6	1.57
24	35	7	4	25	20	15	some	22	78	6	10	15	0	27	20	58	9	20	5	8	42	10	2	0	1.38
25	33	5	4.5	25	20	12	few	23	77	10	6	16	1	27	17	60	10	9	2	11	32	8	5	2	1.34
26	36	10	2	72	50	15	few	22	78	6	12	14	0	27	19	59	9	12	2	7	30	10	4	2	1.29
27	37	8	1.5	120	30	10	some	32	68	8	10	12	7	22	9	59	6	9	0	10	25	8	2	0	1.38
28	34	3	2	5	20	25	some	24	76	4	12	12	3	29	16	60	13	10	2	7	32	6	4	6	1.34
29	31	2	3	42	5	15	some	24	76	6	10	15	4	26	12	64	6	11	4	5	26	6	0	1	1.21
30	35	5	4	17	10	10	few	28	72	3	10	12	4	26	17	55	5	10	2	7	24	6	2	0	1.19
31	34	6	3	18	15	12	few	29	71	9	4	12	1	32	13	58	7	9	1	10	27	8	4	4	1.35
32	36	1.5	4	7	10	10	few	13	57	12	15	6	0	38	16	71	10	15	3	10	38	8	4	0	1.36
33	32	3	2.5	15	30	20	few	11	89	8	15	10	5	29	22	67	6	10	5	7	28	14	5	3	1.28
34	30	7	5	22	15	15	few	18	82	5	12	22	0	19	24	58	6	11	2	10	29	6	2	0	1.13
35	31	2	4	16	20	10	some	13	87	8	10	16	5	30	18	69	11	8	6	10	35	10	8	1	1.25

Cont. Table (12):

sex	age	inf.D	vol.	count.	mot.%	pns.	specel.	N.S	Tab	L.H	S.H	Tap.H	D.H	A.H	N.H*	Total	S.T	C.T	D.T	O.T	T.T	N/M	C.D	L.M	T.Z.I
36	37	6	3	25	50	12	some	35	65	5	10	15	2	26	7	58	7	10	2	10	29	4	2	0	1.43
37	32	2	4	35	7	30	few	20	80	10	8	11	3	20	28	52	10	8	2	8	28	8	4	0	1.43
38	34	2	5	21	30	25	few	17	83	6	9	26	2	20	20	63	11	8	4	10	33	10	5	3	1.15
39	30	3	3	18	10	15	few	14	86	10	9	19	4	31	13	73	7	13	7	12	39	8	5	2	1.31
40	31	4	4	7	20	25	some	16	84	9	6	15	0	25	29	55	5	11	2	10	28	6	3	0	1.44
41	35	3.5	4.5	25	20	25	few	21	79	7	8	10	0	32	22	57	8	20	3	10	41	8	2	2	1.1
42	33	2	4	20	10	12	few	19	81	8	7	18	3	26	19	62	5	7	3	10	25	8	2	2	1.57
43	32	2	4	18	20	20	some	27	73	6	5	16	5	27	14	59	7	10	6	15	38	10	4	0	1.49
44	32	3	3	16	25	20	few	12	88	5	10	25	4	17	27	61	10	15	7	8	40	10	4	1	1.31
45	35	7	5	25	30	12	few	18	82	5	8	30	7	20	12	70	5	18	2	10	35	15	3	3	1.5
46	31	6	6	42	20	18	many	21	79	2	10	25	4	28	10	69	7	15	5	12	39	10	4	2	1.54
47	36	12	4	50	50	10	some	17	83	8	12	20	5	23	15	68	8	18	7	15	48	11	9	1	1.32
48	37	2	4.5	16	25	15	many	15	85	6	10	25	7	22	15	70	3	12	4	10	29	9	4	3	1.64
49	32	1.5	3	23	50	25	few	20	80	9	8	23	5	25	10	70	5	14	3	1	23	8	4	0	1.31
50	34	3	2.5	18	15	15	few	18	82	10	13	18	4	27	10	72	5	25	5	8	43	10	7	2	1.61
51	35	8	3	10	40	20	few	20	80	6	12	30	10	13	9	71	10	25	11	9	55	30	10	4	2.08
52	34	2	5	10	10	15	many	28	72	2	5	20	12	13	20	82	12	20	9	15	56	20	7	0	1.88
53	28	4	4.5	40	60	15	few	12	88	15	13	17	5	18	20	68	15	12	10	12	49	10	12	8	1.58
54	34	1.5	3.5	20	50	15	few	11	89	10	12	25	16	20	6	83	10	20	9	10	49	15	7	2	1.73
55	35	2	2.5	27	60	20	few	14	86	7	15	30	10	14	10	76	10	15	15	10	50	11	8	2	1.69
56	21	3	2.5	20	30	10	few	25	75	8	12	16	4	20	15	60	8	17	10	15	50	10	6	1	1.68
57	34	2	0.5	16	10	15	many	31	69	5	2	17	6	25	14	55	10	13	14	11	48	9	8	6	1.74

INFD = Duration of infertility.

NS = Normal sperm.

LH = Large Head

Tap H = Tapering Head.

AH = Amorphous Head.

Tot H = Total Head abnormality

CT = Coiled Tail.

OT = Other Tail.

N/M = Neck-Mid piece defect.

LH = Loose Head.

SPCol = Spermatogenic cell.

Tab = Total abnormal from.

SH = Small Head.

DH = Duplicate Head.

NH = Normal Head.

ST = Short tail.

DT = Double Tail.

TT = Total Tail.

CD = Cytoplasmic droplet.

TZI = Tetrao/zoo spermia index.

Table (13) : Strict criteria data of control group

sex	age	vol.	count.	mot.%	pus	sp.cel.	N.S	Tab.	L.H	S.H	Tap. II	D.H	A.H	N.H*	Tot.H	S.T	C.T	D.T	O.T	T.T	N/M	C.D	L.H	T.Z
1	30	5	55	50	1	few	43	57	6	4	10	5	19	13	44	5	8	2	5	20	10	8	4	1.44
2	32	3.5	35	40	4	few	32	68	7	5	10	5	24	17	51	5	8	5	7	25	14	5	4	1.4
3	36	4	70	70	1	few	51	49	7	4	9	5	13	11	38	3	5	4	6	18	10	7	5	1.49
4	41	6	25	40	5	few	26	74	7	6	14	5	25	17	57	2	7	4	6	19	25	5	4	1.3
5	31	3	22	65	0	few	17	83	5	4	18	2	16	38	45	6	8	3	10	27	10	9	4	1.1
6	38	2.5	40	60	1	few	21	79	9	10	8	2	25	25	54	7	4	6	13	30	8	9	0	1.28
7	36	5	57	50	3	few	23	77	12	11	10	6	19	19	58	11	12	9	11	43	9	5	1	1.49
8	31	6	70	60	5	few	18	82	15	8	13	9	25	12	70	5	9	11	15	40	7	9	0	1.54
9	38	4	35	70	4	few	24	76	6	12	15	5	23	15	61	4	10	7	13	34	9	10	3	1.5
10	45	3	28	40	6	few	31	69	11	9	7	3	15	24	45	11	5	4	8	28	5	7	0	1.28
11	30	5	35	60	3	few	28	72	7	8	12	5	19	21	51	6	8	5	7	26	9	4	3	1.25
12	29	6	40	50	2	many	29	71	8	7	13	4	21	18	53	7	7	4	8	26	10	5	2	1.32
13	31	5	30	60	3	some	27	73	9	8	12	5	23	12	57	8	8	5	10	31	10	4	3	1.4

Figure (1) : Normal Sperm.

Figure (2) : Normal sperm, Cytoplasmic droplet.

Figure (3) : Tapering Head.

Figure (4) : Spermatogenic Cell.

Figure (5) : Round Head.

Figure (6) : Double Head, Coiled Tail, Spermatogenic cell.

Figure (7) : Trilobed Head, Loose Head, Irregular Tail.