RESULTS

Clinical data of the studied groups:

The number of the patients included in this study was 50 patients, while the number of the control group was 10 healthy subjects **(Table 12).** Patients were divided into five groups (A, B, C, D and E) **(Table 7-11).** Each group included ten patients.

Table (7): Clinical data of group A

Case	Age	Sex	Duration	Caspase-3	Fas	Bcl-2	NF-κB	P53
1.	24	Female	1	4	3.3	2	0	0
2.	45	Male	4	3.3	3	0	0	2
3.	32	Male	1	5	2	0	2.3	0
4.	18	Female	3	2	2.3	0	0	0
5.	23	Male	2	4	2	2	0	0
6.	32	Female	1	2.3	3	0	2	2
7.	34	Female	1	5	2.7	2.3	0	0
8.	27	Male	5	2.7	3	0	0	0
9.	19	Female	3	3.3	2	0	0	2.3
10.	50	Male	3	2	2.3	0	2.7	0

Table (8): Clinical data of group B

Case	Age	Sex	Duration	Caspase-3	Fas	Bcl-2	NF-κB	P53
1.	34	Male	3	3	2.3	2	0	0
2.	44	Male	2	5	3	0	2	2.7
3.	26	Female	2	3	2	0	0	0
4.	38	Male	4	2.7	3.3	2.7	0	0
5.	19	Male	1	4	5	0	2.3	2
6.	24	Male	2	3	2	0	0	0
7.	31	Male	2	2.7	4	2	0	0
8.	23	Female	5	2.3	2.7	0	2.3	2.3
9.	40	Male	2	2	3	0	0	0
10.	29	Male	3	3	2	0	0	0

Table (9): Clinical data of group C

Case	Age	Sex	Duration	Caspase-3	Fas	Bcl-2	NF-κB	P53
1.	25	Female	1	3	2	0	0	0
2.	34	Male	2	2.7	3	0	2	0
3.	30	Male	1	5	3	0	0	0
4.	27	Female	1	3	2.3	2	0	0
5.	36	Male	4	2.3	2	0	0	2
6.	24	Male	2	3	3	0	0	0
7.	31	Male	3	2.7	3	0	0	0
8.	19	Female	5	2	2.3	0	0	0
9.	46	Male	1	4	2	2	0	0
10.	26	Male	2	2.7	3	0	0	0

Table (10): Clinical data of group D

Case	Age	Sex	Duration	Caspase-3	Fas	Bcl-2	NF-κB	P53
1.	23	Male	3	2	3	0	0	0
2.	35	Male	1	2.3	2.7	0	2.3	2
3.	27	Female	3	2	3	0	0	0
4.	36	Male	2	3	3	0	0	0
5.	43	Male	5	2.3	2.7	0	0	0
6.	36	Female	3	2	2	0	2	2.3
7.	41	Male	3	2	2.3	2	0	0
8.	38	Female	2	4	2	0	0	0
9.	26	Male	3	2.7	3	0	0	0
10.	33	Male	4	2	2.3	0	0	0

Table (11): Clinical data of group E

Case	Age	Sex	Duration	Caspase-3	Fas	Bcl-2	NF-κB	P53
1.	35	Female	2	3	2	2	0	0
2.	41	Male	5	2.3	2	0	2.7	0
3.	26	Male	4	2	2	2	0	0
4.	36	Female	1	2.7	3	0	0	2
5.	24	Male	2	3	2.7	0	0	0
6.	27	Male	2	2.3	3	0	0	0
7.	31	Male	3	3	2	0	0	0
8.	41	Female	1	3	2.3	0	2	0
9.	46	Male	2	2	3	0	0	0
10.	23	Male	2	3	3	2	0	0

Table (12): Clinical data of the control group

Case	Age	Sex	Caspase-3	Fas	Bcl-2	NF-κB	P53
1.	29	Female	0	0	2.7	0	0
2.	40	Male	2.3	0	0	0	0
3.	43	Male	0	0	0	0	0
4.	36	Female	0	0	0	2	2
5.	18	Male	0	2.7	0	0	0
6.	24	Male	0	0	0	0	0
7.	21	Male	0	0	0	2	0
8.	31	Female	2	2	0	0	0
9.	25	Male	0	0	2	0	2
10.	28	Male	0	0	0	2.3	0

Demographic characteristics of the studied groups:

This study included 50 cases with spongiotic disorders (34 males and 16 females) and 10 healthy persons served as control group (7 males and 3 females), **(Table 13).**

Table (13): Group sex-cross tabulation

	Sex		Total
	Male	Female	
Patients	34	16	50
Control	7	3	10
Total	41	19	60

The mean age of the patients group was 31.56 years ± 8.089 years, while the mean age of the control group was 29.50 years ± 8.127. There was no statistically significant difference between patients group and control group (P-value =0.465), **(Table 14).**

Table (14): Group age-cross tabulation

	Number	Minimum	Maximum	Mean	SD	P-value*
Patients	50	18 y	50 y	31.56	8.089	0.465
Control	10	18 y	43 y	29.5	8.127	

y= years, SD=standard deviation
P-value***** equal to or less than 0.05 is significant.

The mean age of the male patients group was 32.88 years ± 8.190 years, while the mean age of the male control group was 28.43 years ± 9.502 years. There was no statistically significant difference between male patients group and male control group (P-value =0.209), **(Table 15).**

The mean age of the female patients group was 28.75 years ±7.335 years, while the mean age of the female control group was 32.00 years ± 3.606 years. There was no statistically significant difference between

female patients group and female control group (P-value =0.470), **(Table 15).**

Table (15): Group age –sex statistics

	Patients		Control		P-value *
	Mean	SD	Mean	SD	
Male	32.88	8.190	28.43	9.502	0.209
Female	28.75	7.335	32.00	3.606	0.470

y= years, SD=standard deviation
P-value * equal to or less than 0.05 is significant.

AD patients had a mean age of 30.4 years ± 10.574 years, ACD patients had a mean age of 30.79 years ± 8.121 years, ICD patients had a mean age of 29.799 years ± 7.568 years, NE patients had a mean age of 33.799 years ±6.579 years and DE patients had a mean age of 33.0 years ±8.027 years. Using bivarate statistical analysis, there was no statistically significant correlation between age of the patients and cutaneous lesions, **(Table 16).**

Table (16): Correlation between age of the patients and different patient subgroups

Variable	AD	ACD	ICD	NE	DE
Minimum	18	19	19	23	23
Maximum	50	44	46	43	46
Mean	30.40	30.79	29.799	33.799	33.0
SD	10.574	8.121	7.568	6.579	8.027
r	0.145	-0.235	0.092	0.251	-0.022
P-value*	0.687	0.513	0.800	0.484	0.950

y= years, SD=standard deviation
r= Correlation
* Correlation is significant at the 0.05 level

The mean duration was 2.500 weeks ± 1.249 weeks. The AD patients had a mean duration of 2.400 weeks ± 1.116 weeks, ACD patients had a mean duration of 2.600 weeks ± 1.174 weeks, ICD patients had a mean duration of 2.200 weeks ± 1.398 weeks, NE patients had a mean duration of 2.900 weeks ± 1.101 weeks and DE patients had a mean duration of 2.400 weeks ± 1.265 weeks, **(Table 17)**.

Table (17): Comparison of the mean value of duration of lesions in different patient subgroups

Variable		AD	ACD	ICD	NE	DE
Duration	Mean	2.400	2.600	2.200	2.900	2.400
	SD	1.430	1.174	1.398	1.101	1.265

SD=standard deviation

The immunopathological changes:

In the present study the mean value of cleaved caspase-3 expression was 2.906 ± 0.855 while it was 0.430 ± 0.909 in the control group, **(Table 18) & (Figure 4 & 5).** There was a statistically significant difference between patients group and control group (P-value <0.001) in favor of patients group. Cleaved caspase-3 was detectable in keratinocytes of the basal layer of all skin specimens taken from lesional skin as brown cytoplasmic staining. In the spinous cell layer, cleaved caspase-3 was observed in all specimens taken from lesional skin. Strongest positive staining was noticed in areas of spongiosis. In contrast, in normal skin, cleaved caspase-3 staining was rarely detectable.

The mean value of caspase-3 expression in the male patients group was 2.903 ± 0.867 while it was in the male control group 0.328 ± 0.869, **(Table 19) & (Figure 6)**. There was a statistically significant difference

between patients group and control group (P-value <0.001) in favor of males of the patients group.

The mean value of caspase-3 expression in the female patients group was 2.875 ± 0.876 while it was in the female control group 0.666 ± 1.155, **(Table 20)& (Figure 7)**. There was a statistically significant difference between patients group and control group (P-value <0.001) in favor of females of the patients group.

The mean value of caspase-3 expression was 2.903 ± 0.867 in male patients, while it was 2.875 ± 0.876 in female patients. The mean value of caspase-3 expression in male patients is higher than female patients. There was no statistically significant difference between both groups (P-value =0.916), **(Table 21& Figure 8)**.

When we studied the differences in cleaved caspase-3 expression values among different patient subgroups using Two-Way analysis of variance (ANOVA), there was no statistically significant difference in mean cleaved caspase-3 expression values between different groups (P-value =0.604). The cleaved caspase-3 expression values decreased in the following order: AD > ACD > ICD > DE > NE (3.360 ± 1.129 > 3.070 ± 0.857 > 3.040 ± 0.8656 > 2.630 ± 0.4347 > 2.430 ± 0.6516, respectively) **(Table 22) & (Figure 9)**.

In the present study the mean value of Fas expression was 2.630 ± 0.601 while it was 0.470 ± 1.004 in the control group **(Table 18) & (Figure 4 & 10).** There was a statistically significant difference between patients group and control group (P-value <0.001) in favor of patients group. Positive Fas expression of keratinocytes was observed in lesional

skin as brown cytoplasmic staining. In contrast, Fas expression on keratinocytes was almost undetectable in normal skin.

The mean value of Fas expression in the male patients group was 2.724 ± 0.644 while it was 0.385 ± 1.021 in the male control group, **(Table 19) & (Figure 11)**. There was a statistically significant difference between patients group and control group (P-value <0.001) in favor of males of the patients group.

The mean value of Fas expression in the female patients group was 2.431± 0.451 while it was 0.666 ± 1.155 in the female control group, **(Table 20) & (Figure 12)**. There was a statistically significant difference between patients group and control group (P-value <0.001) in favor of females of the patients group.

The mean value of Fas expression was 2.724 ± 0.644 in male patients, while it was 2.431 ± 0.451 in female patients. The mean value of Fas expression in male patients is higher than female patients. There was no statistically significant difference between both groups (P-value =0.916), **(Table 21 & Figure 13)**.

When we studied the differences in Fas expression values among different patient subgroups using Two-Way ANOVA, there was no statistically significant difference in mean Fas expression values between different groups (P-value = 0.109). The Fas expression values decreased in the following order: ACD >AD > NE > ICD > DE (2.930 ± 0.978 > 2.560 ± 0.497 > 2.600 ± 0.416 > 2.560 ± 0.476 > 2.500 ± 0.480, respectively) **(Table 22) & (Figure 14)**.

The mean value of Bcl-2 expression was 0.580 ± 0.945 in the patients group while it was 0.470 ± 1.004 in the control group, **(Table 18) & (Figure 4)**. Bcl-2 expression was detected as brown cytoplasmic staining. There was no statistically significant difference between patients group and control group (P-value = 0.740).

The mean value of Bcl-2 expression in males of the patients group was 0.491 ± 0.906 while it was 0.285 ± 0.756 in males of the control group, **(Table 19)**. There was no statistically significant difference between males of the patients group and control group (P-value =0.579).

The mean value of Bcl-2 expression in females of the patients group 0.518 ± 0.930, while it was 0.900 ± 1.559 in females of the control group, **(Table 20)**. There was no statistically significant difference between females of the patients group and control group (P-value =0.562).

The mean value of Bcl-2 expression in male patients was 0.491 ± 0.906, while it was 0.518 ± 0.930 in female patients. The mean value of Bcl-2 expression in female patients is higher than male patients. There was no statistically significant difference (P-value =0.921), **(Table 21)**.

When we studied the differences in Bcl-2 expression values among different patient subgroups using Two-Way ANOVA, there was no statistically significant difference in mean Bcl-2 expression values between different groups (P-value =0.684). The Bcl-2 expression values decreased in the following order: ACD > AD > DE > ICD > NE (0.670 ± 1.095 > 0.630 ± 1.018 > 0.600 ± 0.966 > 0.400 ± 0.843 > 0.200 ± 0.632, respectively) **(Table 22)**.

The mean value of NF-κB expression was 0.372 ± 0.803 in the patients group while it was 0.630 ± 1.018 in the control group, **(Table 18) & (Figure 4)**. NF-κB expression was detected as brown cytoplasmic staining. There was no statistically significant difference between patients group and control group (P-value = 0.379).

The mean value of NF-κB expression in males of the patients group was 0.391 ± 0.864 while it was 0.285 ± 0.755 in males of the control group, **(Table 19)**. There was no statistically significant difference between males of the patients group and control group (P-value =0.766).

The mean value of NF-κB expression in females of the patients group 0.393 ± 0.848, while it was 0.666 ± 1.155 in females of the control group, **(Table 20)**. There was no statistically significant difference between females of the patients group and control group (P-value =0.632).

The mean value of NF-κB expression in male patients was 0.391 ± 0.864, while it was 0.393 ± 0.848 in female patients. The mean value of NF-κB expression in female patients is higher than male patients. There was no statistically significant difference (P-value =0.992), **(Table 21)**.

When we studied the differences in NF-κB expression values among different patient subgroups using Two-Way ANOVA, there was no statistically significant difference in mean NF-κB expression values between different groups (P-value = 0.759). The NF-κB expression values decreased in the following order: AD >ACD > DE >NE> ICD

(0.700 ± 1.139 > 0.660 ± 1.066 > 0.470 ± 1.004 > 0.430 ± 0.909 > 0.200 ± 0.632, respectively) **(Table 22)**.

The mean value of p53 expression was 0.432 ± 0.878 in the patients group while it was 0.400 ± 0.843 in the control group, **(Table 18) & (Figure 4)**. p53 expression was detected as brown nuclear staining. There was no statistically significant difference between patients group and control group (P-value = 0.967).

The mean value of p53 expression in males of the patients group was 0.314 ± 0.777 while it was 0.285 ± 0.755 in males of the control group, **(Table 19)**. There was no statistically significant difference between males of the patients group and control group (P-value =0.977).

The mean value of p53 expression in females of the patients group 0.681 ± 1.047, while it was 0.666 ± 1.155 in females of the control group, **(Table 20)**. There was no statistically significant difference between females of the patients group and control group (P-value =0.995).

The mean value of p53 expression in male patients was 0.314 ± 0.777, while it was 0.681 ± 1.047 in female patients. The mean value of p53 expression in female patients is higher than male patients. There was no statistically significant difference (P-value =0.171), **(Table 21)**.

When we studied the differences in p53 expression values among different patient subgroups using Two-Way ANOVA, there was no statistically significant difference in mean p53 expression values between different groups (P-value =0.298). The p53 expression values decreased in the following order: ACD >AD > NE> DE > ICD (0.700 ± 1.139 >

0.630 ± 1.018 > 0.430 ± 0.909 > 0.222 ± 0.666 > 0.200 ± 0.632, respectively) **(Table 22)**.

Table (18): Comparison between patients group and control group regarding expression of caspase-3, Fas, Bcl-2, NF-κB and p53

	Patients (50)		**Controls (10)**		**P-value ***
	Mean	SD	Mean	SD	
Caspase-3	2.906	0.855	0.430	0.909	<0.001
Fas	2.630	0.601	0.470	1.004	<0.001
Bcl-2	0.580	0.945	0.470	1.004	0.740
NF-κB	0.372	0.803	0.630	1.018	0.379
p53	0.432	0.878	0.400	0.843	0.967

SD=standard deviation

P-value * equal to or less than 0.05 is significant.

Table (19): Comparison between male patients group and male control group regarding caspase-3, Fas, Bcl-2, NF-κB and p53

	Male Patients (34)		**Male Control (7)**		**P-value ***
	Mean	SD	Mean	SD	
Caspase-3	2.903	0.867	0.328	0.869	<0.001
Fas	2.724	0.644	0.385	1.021	<0.001
Bcl-2	0.491	0.906	0.285	0.755	0.578
NF-κB	0.391	0.864	0.285	0.755	0.766
p53	0.314	0.777	0.285	0.755	0.928

SD=standard deviation

P-value * equal to or less than 0.05 is significant.

Table (20): Comparison between female patients group and female control group regarding caspase-3, Fas, Bcl-2, NF-κB and p53

	Female Patients (16)		Female Control (3)		P-value *
	Mean	SD	Mean	SD	
Caspase-3	2.875	0.876	0.666	1.155	0.001
Fas	2.431	0.451	0.666	1.155	0.001
Bcl-2	0.518	0.930	0.900	1.559	0.562
NF-κB	0.393	0.848	0.666	1.155	0.632
p53	0.681	1.047	0.666	1.155	0.982

SD=standard deviation

P-value * equal to or less than 0.05 is significant.

Table (21): Comparison between male patients and female patients regarding caspase-3, Fas, Bcl-2, NF-κB and p53

	Male Patients (34)		Female patients (16)		P-value *
	Mean	SD	Mean	SD	
Caspase-3	2.903	0.867	2.875	0.876	0.916
Fas	2.724	0.644	2.431	0.451	0.109
Bcl-2	0.491	0.906	0.518	0.930	0.921
NF-κB	0.391	0.864	0.393	0.848	0.992
p53	0.432	0.878	0.681	1.047	0.171

SD=standard deviation

P-value * equal to or less than 0.05 is significant.

Table (22): Comparison between different patient subgroups regarding caspase-3, Fas, Bcl-2, NF-κB and p53

		AD	ACD	ICD	NE	DE	P-value *
Caspase-3	Mean	3.360	3.070	3.040	2.430	2.630	0.604
	SD	1.129	0.857	0.865	0.651	0.434	
Fas	Mean	2.560	2.930	2.560	2.600	2.500	0.137
	SD	0.497	0.978	0.476	0.416	0.480	
Bcl-2	Mean	0.630	0.670	0.400	0.200	0.600	0.684
	SD	1.018	1.095	0.843	0.632	0.966	
NF-κB	Mean	0.700	0.660	0.200	0.430	0.470	0.759
	SD	1.139	1.066	0.632	0.909	1.004	
p53	Mean	0.630	0.700	0.200	0.430	0.222	0.298
	SD	1.018	1.139	0.632	0.909	0.666	

SD=standard deviation

P-value * equal to or less than 0.05 is significant.

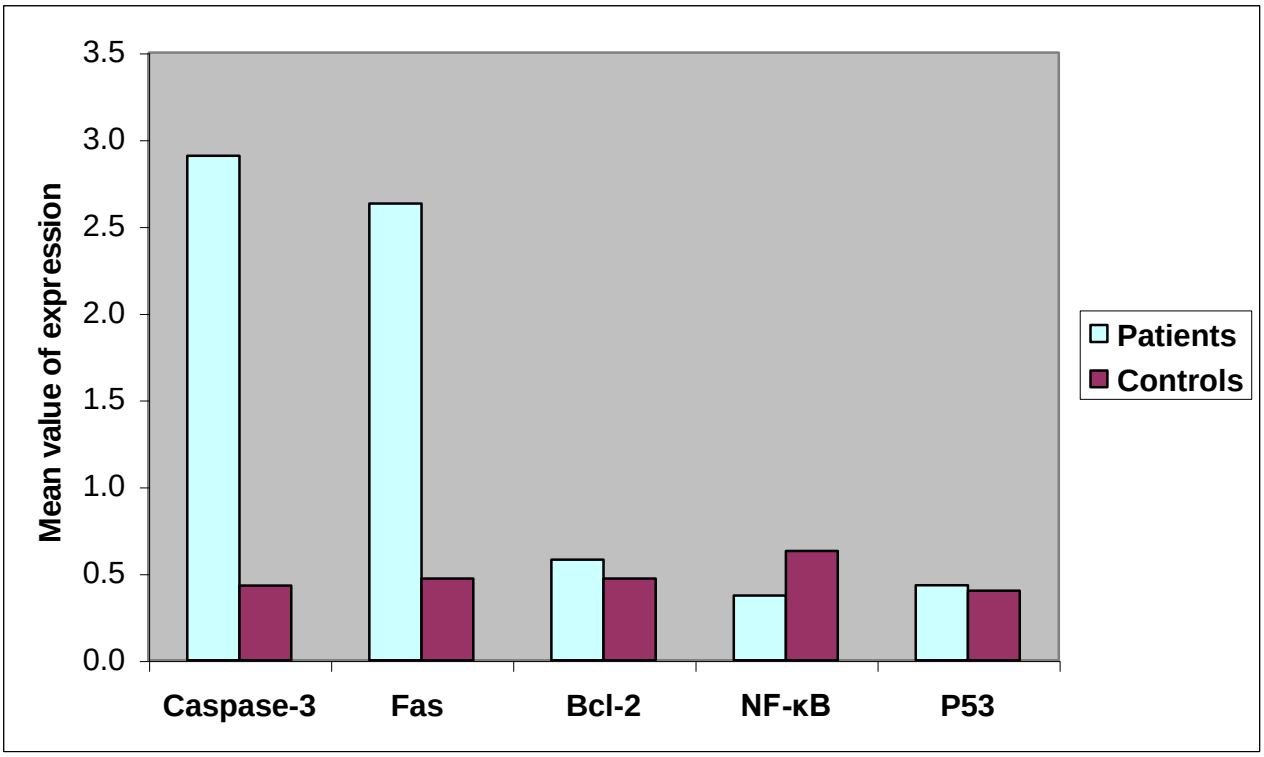

Figure (4): Comparison between patients group and control group regarding expression of caspase-3, Fas, Bcl-2, NF-κB and p53.

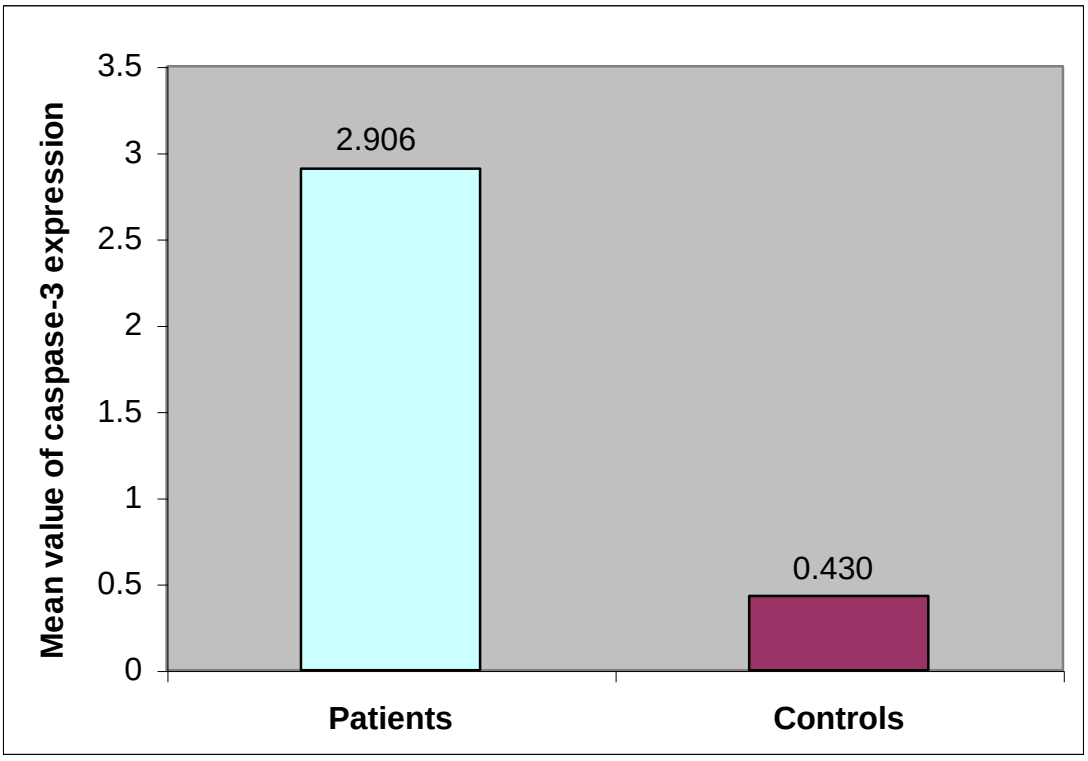

Figure (5): Comparison of caspase-3 expression between the patients and the controls.

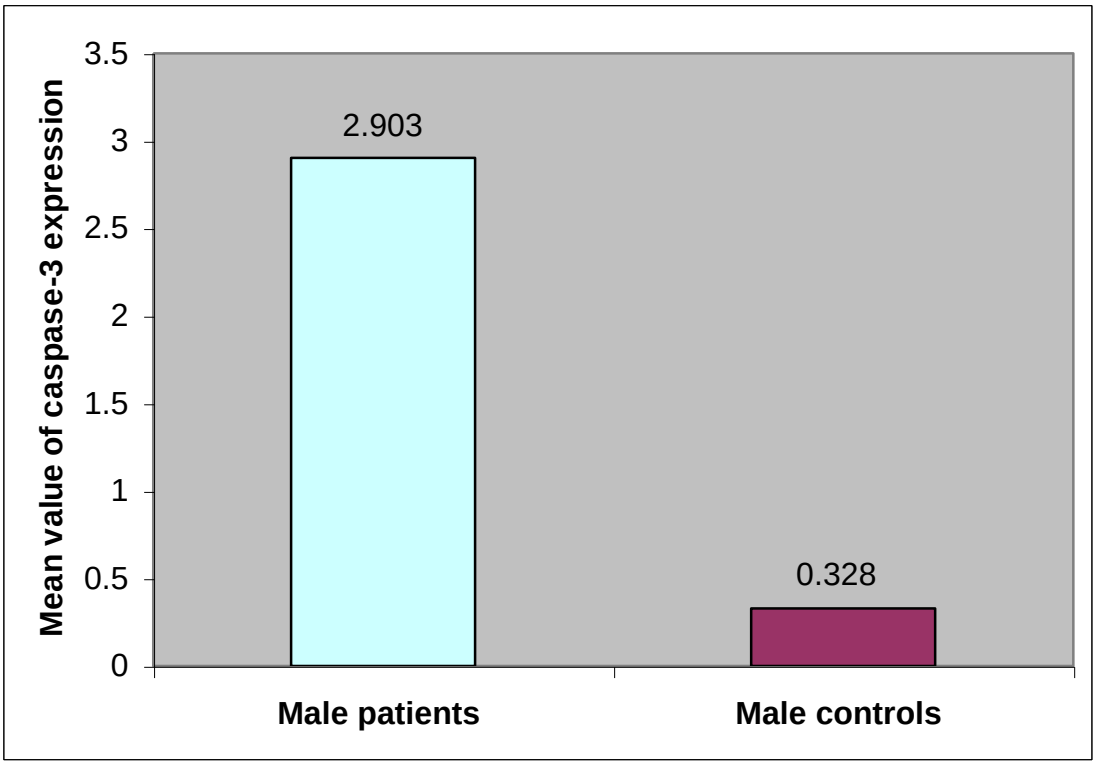

Figure (6): Comparison of caspase-3 expression between the male patients and the male controls.

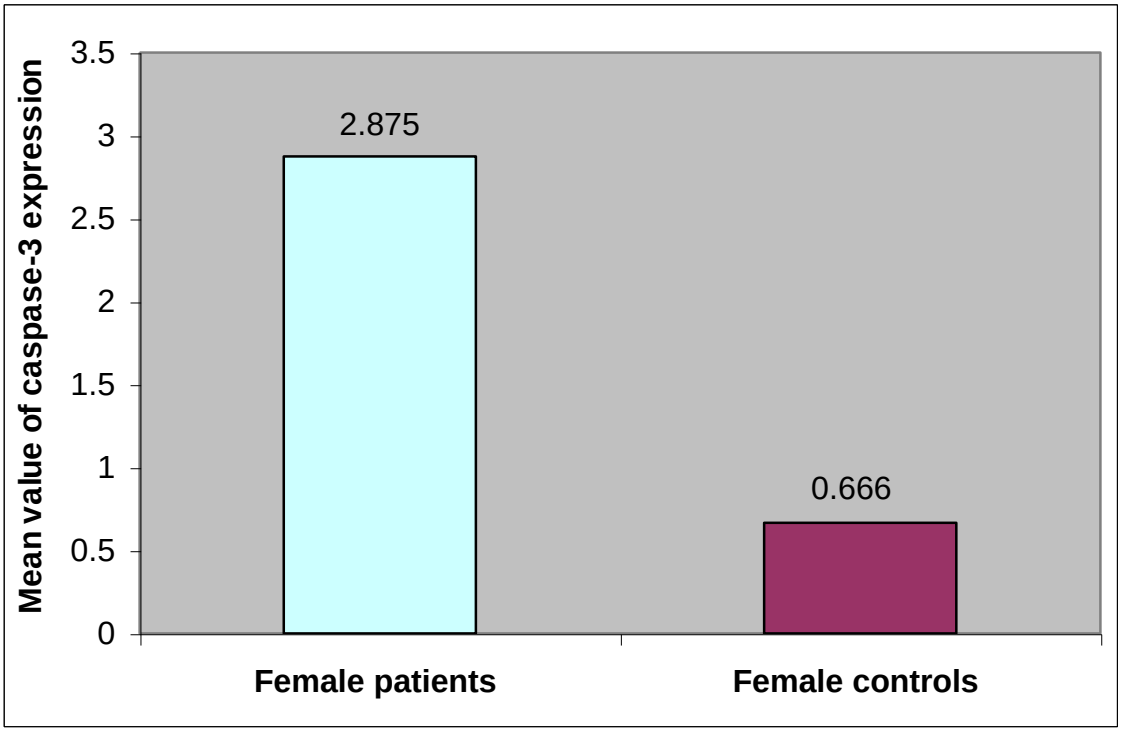

Figure (7): Comparison of caspase-3 expression between the female patients and the female controls.

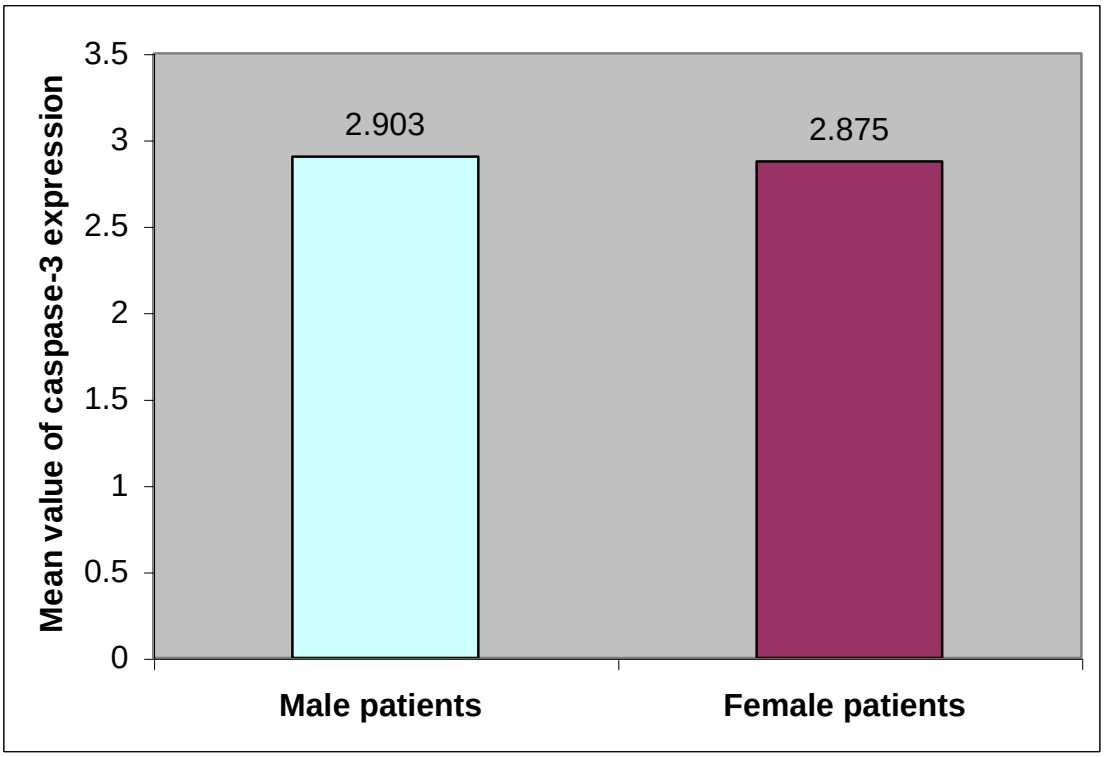

Figure (8): Comparison of caspase-3 expression between female and male patients.

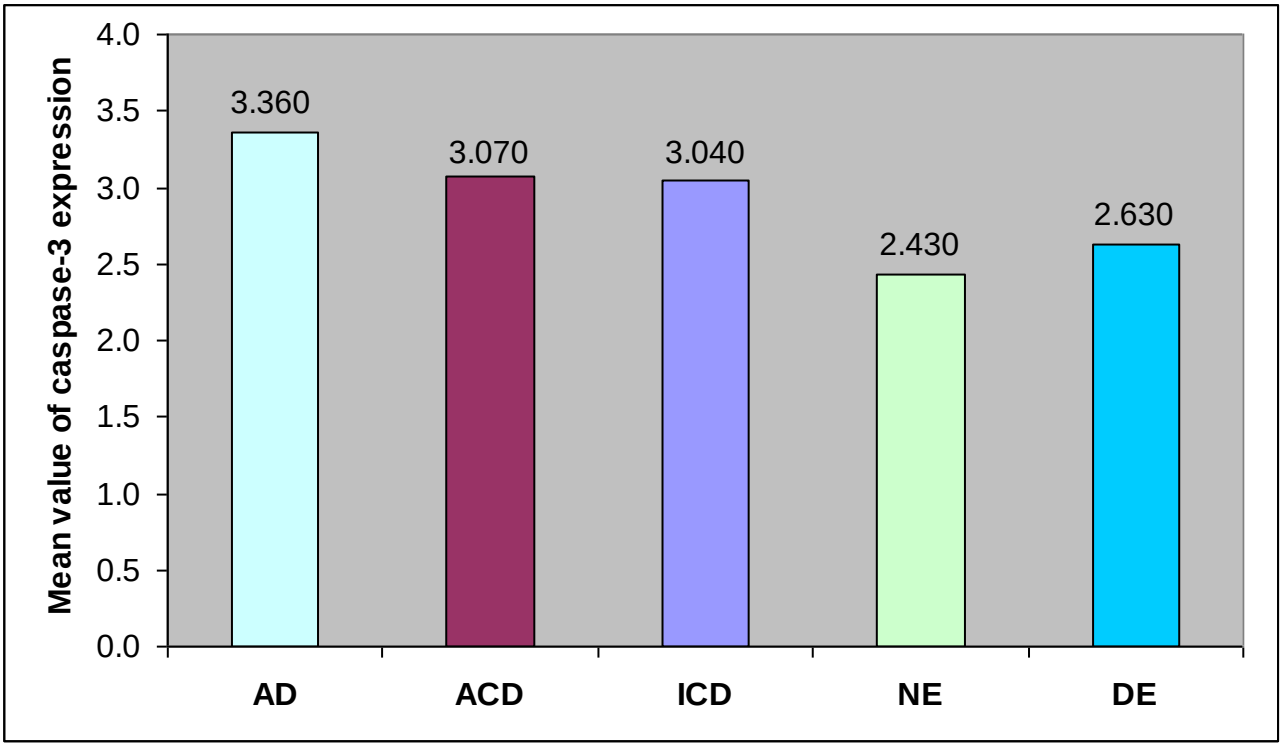

Figure (9): Comparison of caspase-3 expression between different patient subgroups.

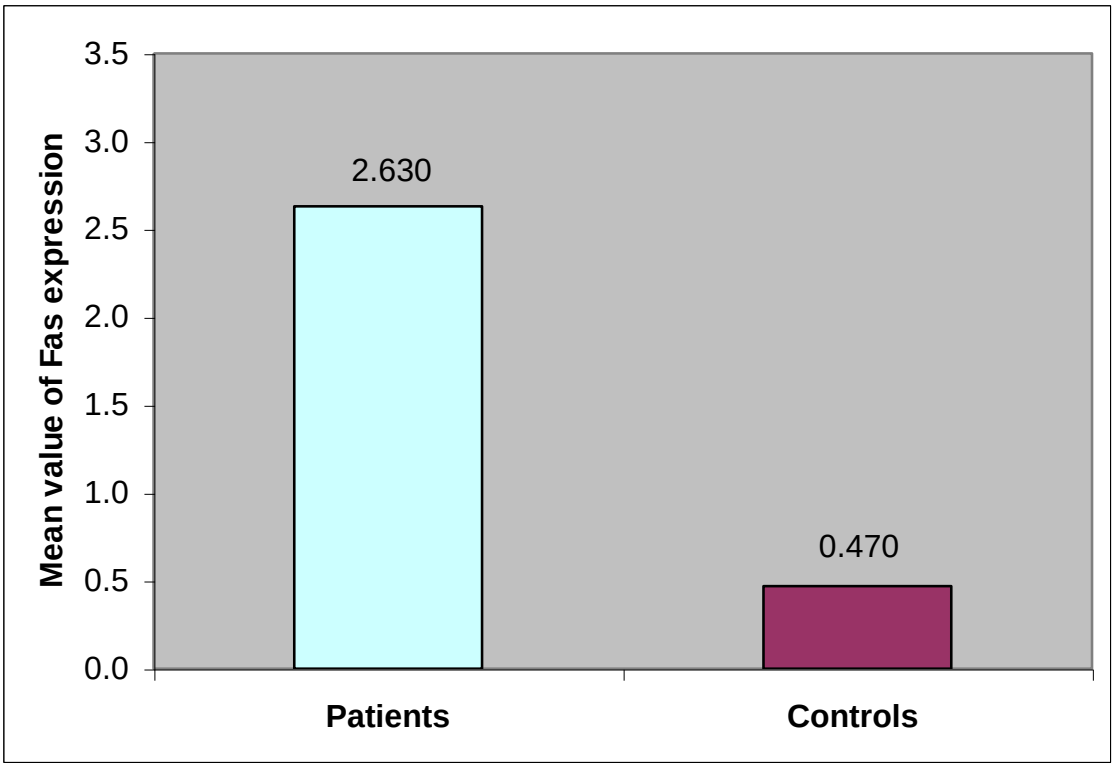

Figure (10): Comparison of Fas expression between the patients and the controls.

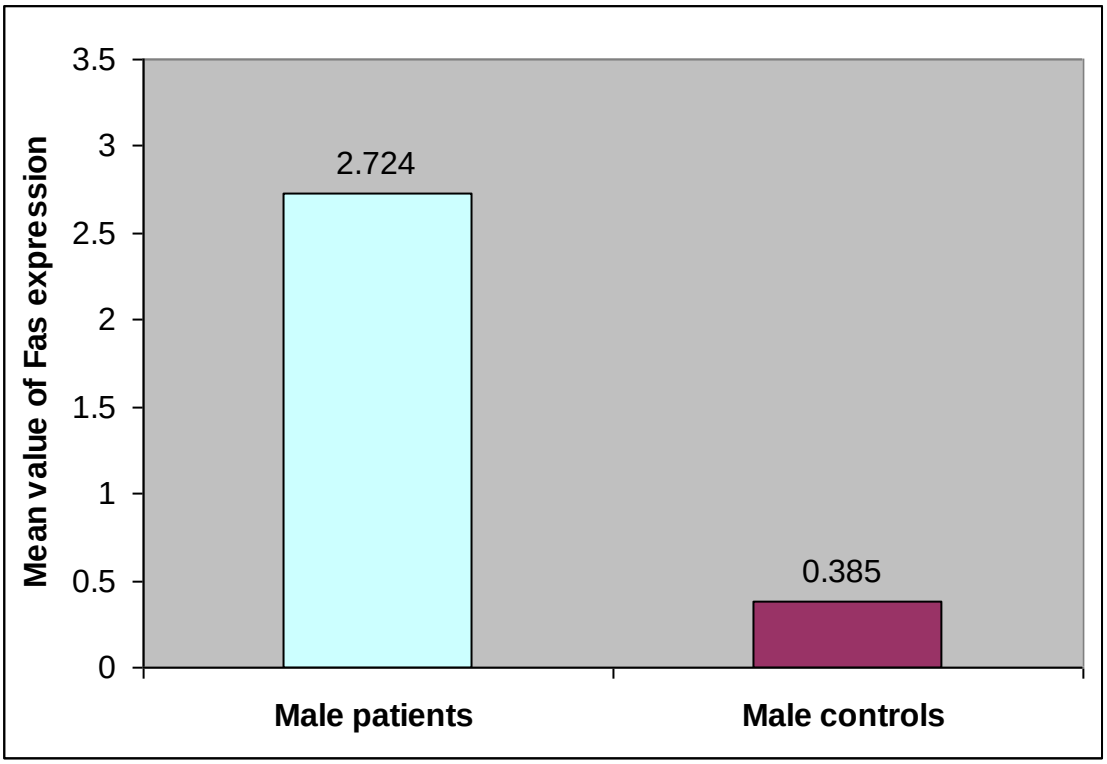

Figure (11): Comparison of Fas expression between the male patients and the male controls.

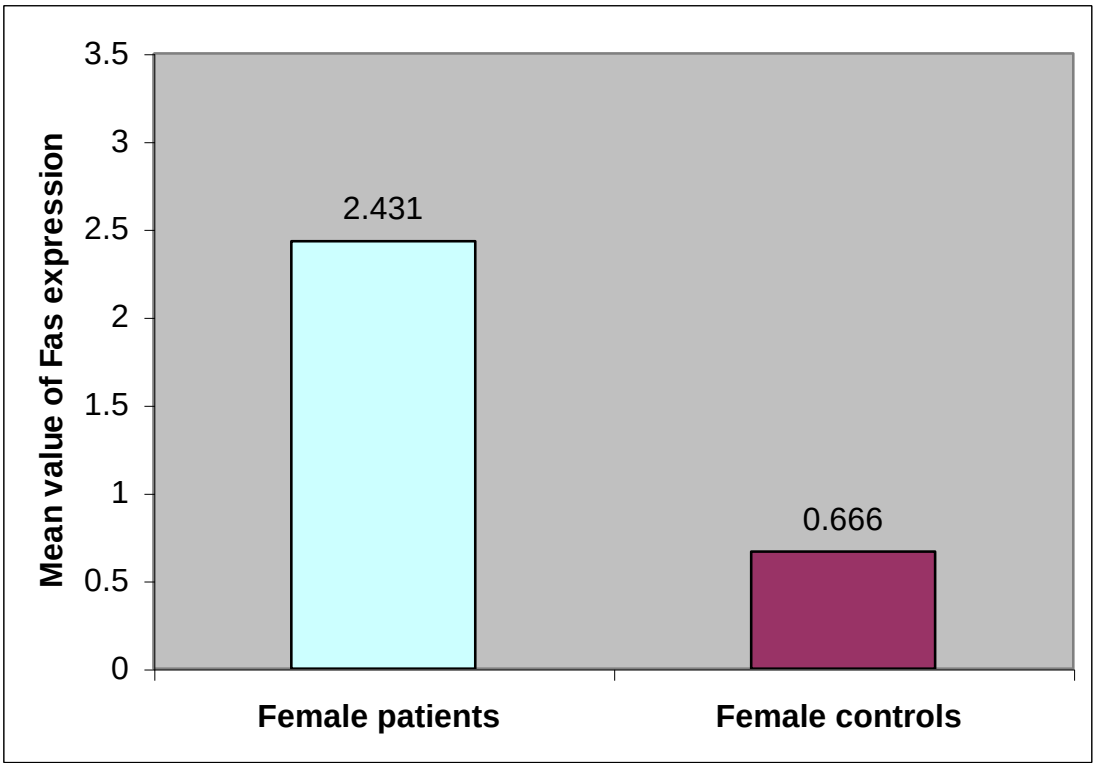

Figure (12): Comparison of Fas expression between the female patients and the female controls.

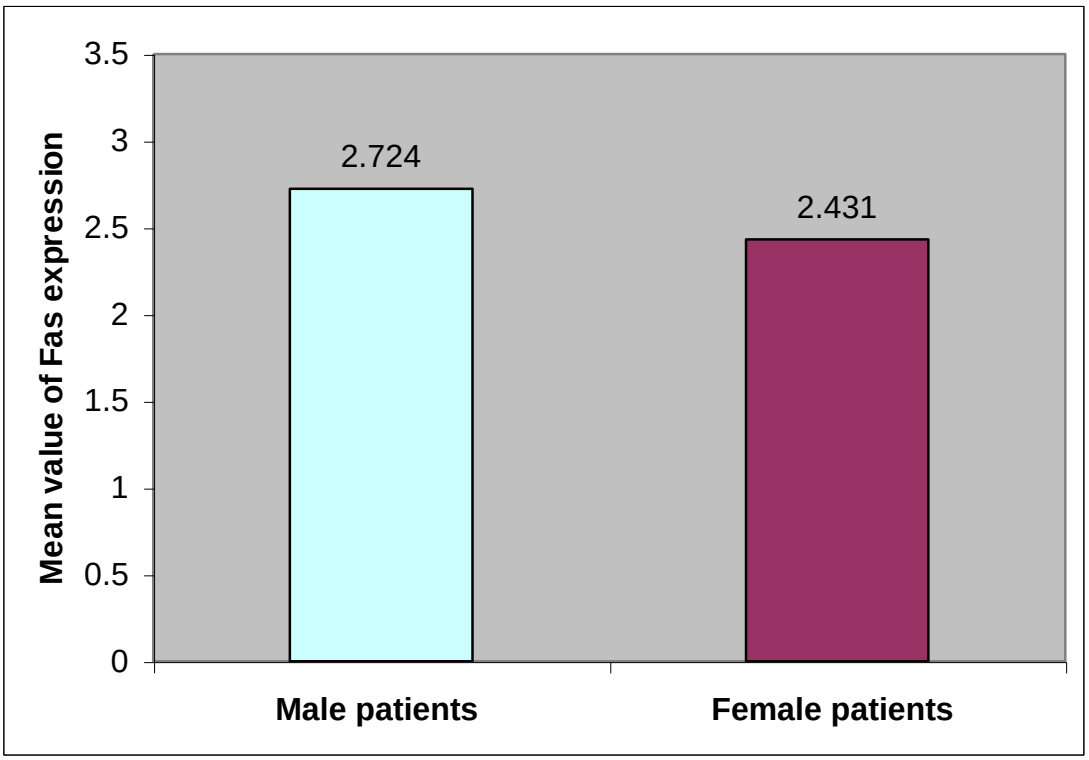

Figure (13): Comparison of Fas expression between male and female patients.

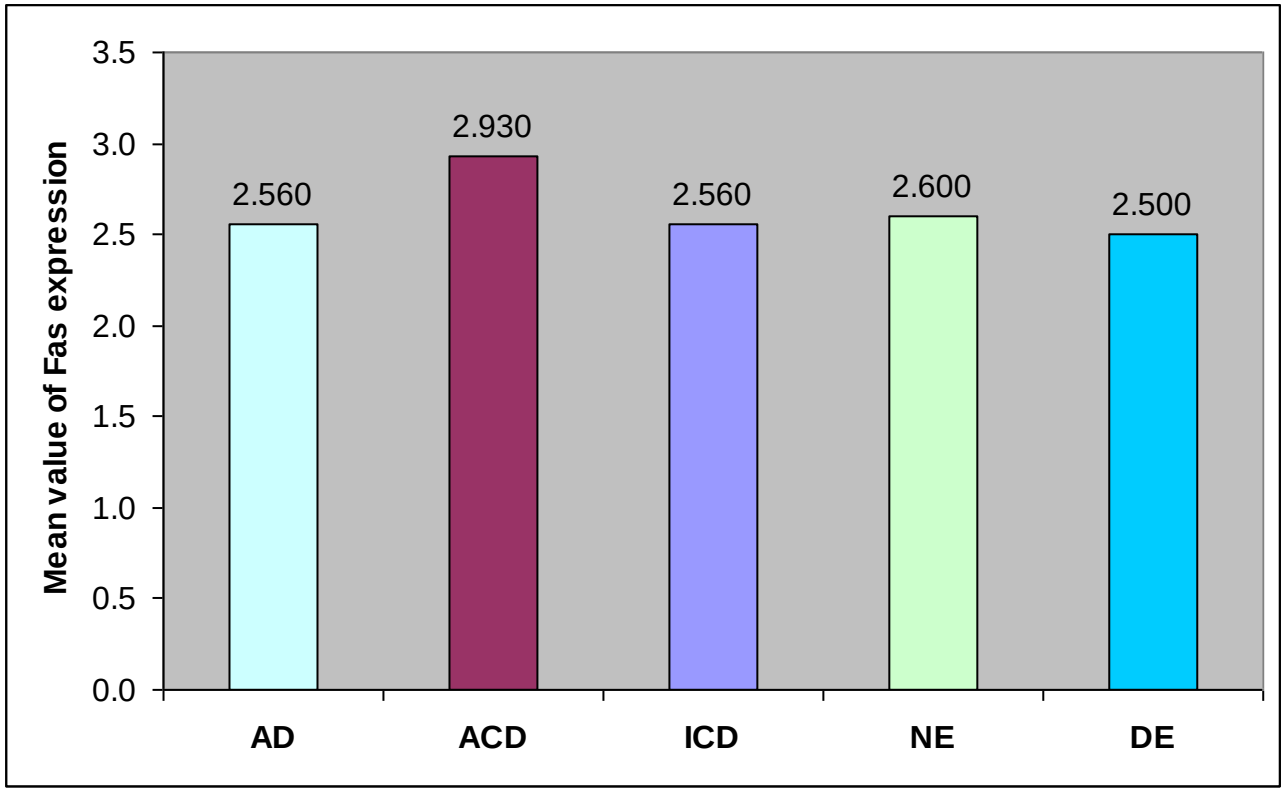

Figure (14): Comparison of Fas expression between different patient subgroups.

There was no statistically significant correlation between age of patients and expression of caspase-3, Fas, Bcl-2, NF-κB and p53 (r =0.468, P-value=0.001). There was statistically significant correlation between duration of lesions and expression of caspase-3 (r =0.468, P-value=0.001), while there was no statistically significant correlation between duration of lesions and expression of Fas, Bcl-2, NF-κB and p53 (r =0.468, P-value=0.001), **(Table 23)**.

Table (23): Correlation between age and duration and caspase-3, Fas, Bcl-2, NF-κB and p53 expression

Variable		**Caspase-3**	**Fas**	**Bcl-2**	**NF-κB**	**p53**
Age	r	-0.036	0.015	0.088	-0.265	0.177
	Sig.	0.800	0.917	0.542	0.062	0.218
Duration	r	-0.327	0.023	-0.171	0.058	0.013
	Sig.	0.020*	0.873	0.233	0.684	0.928

r= Correlation
* Correlation is significant at the 0.05 level

When we studied the correlation between caspase-3, Fas, Bcl-2, NF-κB and p53 expression using Independent-Samples T Test, the only statistically significant correlation was between the expression of caspase-3 and fas (r =0.364, P-value=0.009), **(Table 24).**

Table (24): Correlation between caspase-3, Fas, Bcl-2, NF-κB and p53 expression

Variable		**Caspase-3**	**Fas**	**Bcl-2**	**NF-κB**	**p53**
Caspase-3	r	1	0.364	-0.074	0.008	0.141
	Sig.	-	0.009*	0.608	0.951	0.326
Fas	r	0.364	1	0.156	0.137	0.020
	Sig.	0.009*	-	0.277	0.342	0.886
Bcl-2	r	-0.074	0.156	1	-0.099	-0.093
	Sig.	0.608	0.277	-	0.491	0.516
NF-κB	r	0.008	0.137	-0.099	1	0.113
	Sig.	0.951	0.342	0.491	-	0.432
p53	r	0.141	0.020	-0.093	0.113	1
	Sig.	0.326	0.886	0.516	0.432	-

r= Correlation
* Correlation is significant at the 0.05 level

Figure (15): Adult flexural atopic dermatitis.

Figure (16): Allergic contact dermatitis on the forearm after the use of diclofenac cream.

Figure (17): Irritant contact dermatitis with a sharp margin over the knee.

Figure (18): Nummular eczema.

Figure (19): Dyshidrotic eczema of the palm.

Figure (20): Representative histological findings of acute spongiotic dermatitis (H&E X10).

Figure (21): Representative histological findings of acute spongiotic dermatitis (H&E X40).

Figure (22): A case of atopic dermatitis showing moderate caspase-3 expression (IHX40).

Figure (23): A case of atopic dermatitis showing weak caspase-3 expression (IHX40).

Figure (24): A case of atopic dermatitis showing weak Fas expression (IHX40).

Figure (25): A case of atopic dermatitis showing weak Bcl-2 expression (IHX40).

Figure (26): A case of atopic dermatitis showing weak NF-κB expression (IHX40).

Figure (27): A case of atopic dermatitis showing weak p53 expression (IHX40).

Figure (28): A case of allegic contact dermatitis showing moderate caspase-3 expression (IHX40).

Figure (29): A case of allegic contact dermatitis showing weak caspase-3 expression (IHX40).

Figure (30): A case of allegic contact dermatitis showing moderate Fas expression (IHX40).

Figure (31): A case of allegic contact dermatitis showing weak Fas expression (IHX40).

Figure (32): A case of allegic contact dermatitis showing weak Bcl-2 expression (IHX40).

Figure (33): A case of allegic contact dermatitis showing weak NF-κB expression (IHX40).

Figure (34): A case of allegic contact dermatitis showing weak p53 expression (IHX40).

Figure (35): A case of irritant contact dermatitis showing moderate caspase-3 expression (IHX40).

Figure (36): A case of irritant contact dermatitis showing weak caspase-3 expression (IHX40).

Figure (37): A case of irritant contact dermatitis showing weak Fas expression (IHX40).

Figure (38): A case of irritant contact dermatitis showing weak Bcl-2 expression (IHX40).

Figure (39): A case of irritant contact dermatitis showing weak NF-κB expression (IHX40).

Figure (40): A case of irritant contact dermatitis showing weak p53 expression (IHX40).

Figure (41): A case of nummular eczema showing moderate caspase-3 expression (IHX40).

Figure (42): A case of nummular eczema showing weak caspase-3 expression (IHX40).

Figure (43): A case of nummular eczema showing weak Fas expression (IHX40).

Figure (44): A case of nummular eczema showing weak Bcl-2 expression (IHX40).

Figure (45): A case of nummular eczema showing weak NF-κB expression (IHX40).

Figure (46): A case of dyshidrotic eczema showing weak caspase-3 expression (IHX40).

Figure (47): A case of dyshidrotic eczema showing weak Fas expression (IHX40).

Figure (48): A case of dyshidrotic eczema showing weak Bcl-2 expression (IHX40).

Figure (49): A case of dyshidrotic eczema showing weak NF-κB expression (IHX40).

Figure (50): A case of dyshidrotic eczema showing weak p53 expression (IHX40).