Results

This study was conducted on 30 SLE patients, they were females and their ages ranged from 18 to 47 years with mean age =27.77± 7.977 years. In addition to 20 apparent healthy volunteers who were females and their ages ranged from 18 to 45 years with mean age = 28.25± 7.67 years.

SLE patients were divided into two groups:-

- **Group 1:-** SLE patients with lupus nephritis [16(53.3%)].
- **Group 2:-** SLE patients without lupus nephritis [14(46.6%)]

Table(11): Demographic data of the studied SLE patients:-

	N	Minimum	Maximum	Mean ± SD
Age(years)	30	18	47	27.77±7.977
disease duration(years)	30	1	10	4.27±2.864
Systolic blood pressure(mmHg)	30	100	200	133.5±25
Diastolic blood pressure(mmHg)	30	60	150	88±17
SLEDAI	30	4	39	16.87±10.699
SLICCS	30	0	2	0.73±0.868

Table (11): shows the **demographic data** of the studied SLE patients, Their ages ranged between 18 and 47 years with a mean of 27.77± 7.977 years. Disease duration ranged between 1 and 10 years with a mean of 4.27 ± 2.864 years.

Table (12): Clinical manifestations of the studied SLE patients [Continued]:-

Clinical features of SLE	NO. of patients	Percentage
Fever	5	(16.7%)
Wt loss	2	(6.7%)
Fatigue	8	(26.7%)
Malar rash	18	(60%)
Lymphadenopathy	3	(10%)
HSM	3	(10%)
Pleurisy	10	(33.3%)
Raynauds Phenomenon	10	(33.3%)
Hypertension	13	(43.3%)
Carditis	4	(13.3%)
Stroke	3	(10%)
Seizures	2	(6.7%)
Organic Brain Syndromes	7	(23.3%)
Headache	10	(33.3%)
Arthritis and/or arthralgia	18	(60%)
Nephritis	16	(53.3%)
Leucopenia	11	(36.7%)
Thrombocytopenia	3	(10%)

Clinical features of SLE	NO. of patients	Percentage
Lymphopenia	4	(13.3%)
Alopecia	15	(50%)
Oral ulcers	19	(63.3%)

Table (12): shows the clinical manifestations of the studied SLE patients, The most prevalent manifestations were **oral ulcers** (63.3%), **arthritis** and/or **arthralgia** & **malar rash**(60%), **nephritis** (53.3%) and **alopecia** (50%).

Table (13): The Laboratory Data of the Studied SLE Patients [continued]:

Laboratory Data	Number	Minimum	Maximum	Mean ± SD
HB(g/dl)	30	8.0	13.7	10.637±1.4878
RBCs(million/mm^3)	30	3	5	3.99±0.567
WBCs (thousand/ mm^3)	30	1.8	9.5	4.557±2.0571
Lymphocytes(/mm^3)	30	830	2500	1610.53±494.208
Platelets (thousand/ mm^3)	30	90	350	208.3±73.792
ESR(mm/hour)	30	15	140	65.03±36.527
Serum creatinine (mg/dl)	30	0.6	2.5	1.357±0.5764
Serum urea(mg/dl)	30	20	67	40.63±12.933

Laboratory Data	Number	Minimum	Maximum	Mean ± SD
24 hour urinary protein(gm)	30	0.1	3.8	1.474±1.2106
AST(U/L)	30	13	70	33.93±11.498
ALT(U/L)	30	10	47	31.47±9.269
Fasting blood glucose(mg/dl)	30	70	170	90.93±21.478
C3(mg/dl)	30	20	125	62.28±31.574
C4(mg/dl)	30	12	87	30.07±16.548

Table (13): shows the **laboratory investigations** of the studied SLE patients, including complete blood picture (RBCs, WBCs,lymphocytes, Hb concentration and Platelet count), kidney profile (proteinurea , serum creatinine, blood Urea) ,Liver enzymes (AST& ALT), fasting blood sugar, C3, C4 and ESR .

Table(14): Distribution of ANA in Studied SLE Patients:-

	Number of patients		Percentage	
	Group1	**Group 2**	**Group 1**	**Group 2**
+ve ANA	16	14	(100%)	(100%)
+ve Anti- dsDNA	16	6	(100%)	(42.8%)

Table (14): shows the distribution of **antinuclear antibodies (ANAs)** among the studied SLE Patients. **ANA** was positive in all patients. Anti-ds DNA was positive in all patients of group 1 and in 42.8% of group 2.

Table (15): comparison between cases and control as regards age and laboratory investigations.

	group	N	Mean ± SD	t	p
Age	cases	30	27.77±7.977	0.2	>0.05
	control	20	28.25±7.67		
HB	cases	30	10.637±1.4878	1.6	>0.05
	control	20	11.23±1.08		
WBCs	cases	30	4.557±2.0571	4.9	<0.001
	control	20	7.245±1.6395		
ESR	cases	30	65.03±36.527	7.2	<0.001
	control	20	15.25±7.34		
Platelets	cases	30	208.3±73.792	2.5	<0.05
	control	20	255±46.227		

Table (15): presents a comparison between cases and controls as regards age and blood picture with no statistically significant differences in age ($p>0.05$) and HB%, but a statistically highly significant differences in ESR, WBCs count($p<0.001$) and Platelets count($p< 0.05$).

Table (16): ANA and anti-ds DNA in cases and controls.

	Cases		Controls	
	Number	**Percentage**	**Number**	**Percentage**
ANA	30	100%	0	0%
Anti- dsDNA	22	73.3%	0	0%

Table (16): presents number and percentage of ANA and anti-ds DNA positive subjects among cases and controls. ANA was positive in all the studied SLE patients while anti ds DNA was positive in 22 patients. All controls had negative ANA and anti-ds DNA.

Table (17) : The SLEDAI score of the studied SLE patients:-

SLE patients	SLEDAI		
	Mild	**Moderate**	**Severe**
Group 1	5(31.25%)	7(43.75%)	4(25%)
Group 2	6(42.8%)	6(42.8%)	2(14.2%)

Table (17): shows the **SLEDAI** score of the studied SLE patients, In group 1 it was (4 mild, 8 moderate and 4 severe) while in group 2 it revealed (6 mild, 6 moderate and 2 severe).

Table (18):The SLICC damage index of the studied SLE patients:-

	SLICC		
	0	**1**	**2**
Group 1	5(31.25%)	6(37.5%)	5(31.25%)
Group 2	10(71.4%)	2(14.2%)	2(14.2%)

Table (18): shows the **SLICC** damage index of the studied SLE patients, in group 1 it revealed (0 in 5 patients, 1 in 6 patients and 2 in 5 patients) while in group 2 it revealed (0 in 10 patients, 1 in 2 patients and 2 in 2 patients)

Table(19): The Lipid Profile of the Studied SLE Patients.

Plasma lipid component	Number	Minimum	Maximum	Mean ± SD
TC(150-250) Mg/dl	30	113	425	232.77±86.483
HDL(40-110) Mg/dl	30	20	60	40.70±11.564
LDL(120-170) Mg/dl	30	37	334	157.40±82.586
VLDL(Up to 32) Mg/dl	30	32	218	88.37±51.911
TG(50-200) Mg/dl	30	73	485	197.07±115.481
TC/HDL Ratio (1.7-6.5)	30	1	21	6.56±4.977
HDL/LDL ratio (0.2-1.5)	30	0.06	1.60	0.4363±0.37745

Table (19): shows the **lipid profile** of the studied SLE patients, **TC** ranged from 113-425 mg/dl, **HDL** ranged from 20-60 mg/dl, **LDL** ranged from 37- 334 mg/dl, **VLDL** ranged from 32-218 mg/dl, **TG** ranged from 73- 485 mg/dl, **TC/HDL** ratio ranged from 1- 21 and **HDL/LDL** ranged from 0.06 – 1.6.

Table (20): comparison between cases and control as regards different lipid profile variables.

	Group	N	Mean ± SD	t	p
TC	cases	30	232.77±86.483	5.9	<0.001
	control	20	128.50±35.895		
HDL	cases	30	40.70±11.564	7.5	<0.001
	control	20	69.05±15.094		
LDL	cases	30	157.40±82.586	3.9	<0.001
	control	20	95.55±23.309		
VLDL	cases	30	88.37±51.911	4.3	<0.001
	control	20	45.40±14.054		
TG	cases	30	197.07±115.481	4.4	<0.001
	control	20	99.40±29.950		
TC/HDL	cases	30	6.56±4.977	5.1	<0.001
	control	20	1.88±0.608		
HDL/LDL	cases	30	0.4363±0.37745	2.6	<0.05
	control	20	0.7650±0.49976		

Table (20): shows comparison between cases and controls regarding different lipid profile variables. All show a statistically significant difference ($p < 0.05$).

Table(21): Frequency of renal function abnormalities of the studied SLE patients.

Renal function	Frequency of affected patients	Frequency of non-affected patients
s.creatinine>1.2 mg/dl	11(36.7%)	19(63.3%)
s.urea >40 mg/dl	12(40%)	18(60%)
proteinuria(>0.5g/24hr)	16(53.3%)	14(46.7%)
heamaturia	9(30%)	21(70%)
casts	10(33.3%)	20(66.7%)
pyuria	8(26.7%)	22(73.3%)

Table(21): Frequency of renal function abnormalities of the studied SLE patients**,** **S.creatinine**>1.2mg/dl was present in 11 patients(36.7%),**S.urea** >40 mg/dl was found in 12 patients (40%), **proteinuria** was observed in 16 patients (53.3%), **heamaturia** was present in 9 patients (30%), **casts** were present in 10 patients (33.3%),and **pyuria** was found in 8 patients (26.7%).

Table (22): WHO class of the Studied Lupus nephritis patients(group 1):

WHO class	No.	%
III	6	37.5
IV	8	50
IV - VI	2	12.5

Table (22): Shows the **WHO class** of the Studied Lupus nephritis patients, 6 patients were classified as class III, 8 patients class IV and 2 patients class IV-VI.

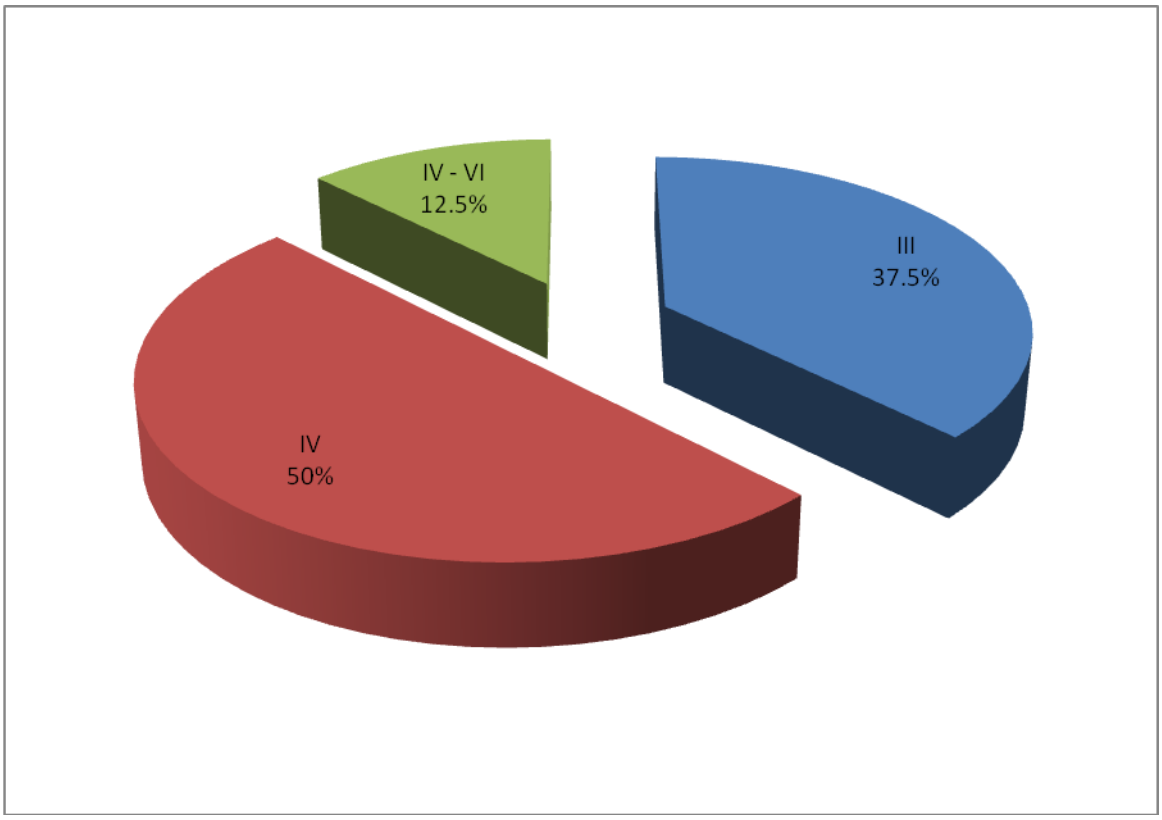

Figure (8):WHO class of the Studied Lupus nephritis patients(group 1).

Table (23): Activity scores of the Studied Lupus nephritis patients(group 1):

Activity score	No.	%
2/24	1	6.25%
4/24	2	12.5%
5/24	1	6.25%
7/24	2	12.5%
8/24	4	25%
11/24	5	31.25%
18/24	1	6.25%

Table (23): Shows the **activity scores** of the studied Lupus nephritis patients.

Table(24):Chronicity scores of the Studied Lupus nephritis patients(group 1):

Chronicity score	No.	%
2/12	2	12.5%
3/12	9	56.25%
4/12	1	6.25%
5/12	2	12.5%
8/12	1	6.25%
12/12	1	6.25%

Table(24): Presents the **chronicity scores** of the studied Lupus nephritis patients.

Table(25): Comparison between group 1 and group 2 as regards different lipid profile variables:

		N	Mean ± SD	t	p
TC	**Group 1**	16	250.78±89.898	1.6	>0.05
	Group2	14	194.50±96.792		
HDL	**Group 1**	16	42.83±12.903	0.5	>0.05
	Group 2	14	40.08±14.681		
LDL	**Group 1**	16	166.17±77.847	0.7	>0.05
	Group 2	14	144.25±91.110		
VLDL	**Group 1**	16	114.49±51.270	5.1	<0.001
	Group 2	14	49.19±15.839		
TG	**Group 1**	16	255.06±114.251	5.03	<0.001
	Group2	14	110.08±35.052		
TC/HDL	**Group 1**	16	8.64±5.451	3.9	<0.05
	Group 2	14	3.43±1.289		
HDL/LDL	**Group 1**	16	0.3106±0.37707	2.5	<0.05
	Group 2	14	0.6250±0.30189		

Table (25): shows a comparison between group 1 and group 2 as regards different lipid profile variables with a statistically significant difference for VLDL,TG ($p<0.001$),TC/HDL & HDL/LDL ($p<0.05$) and no statistically significant difference for TC,HDL-C,LDL-C ($p>0.05$).

Table(26): comparison between group 1 & group 2 as regards different renal functions variables(s.urea &creatinine and 24 hr urinary protein):

		N	Mean±SD	t	p
Creatinine	**Group1**	16	1.683±0.5032	6.1	<0.001
	Group2	14	0.867±0.2188		
urea	**Group1**	16	47.89±11.240	5.9	<0.001
	Group2	14	29.75±5.512		
24 hr.urinary Protein	**Group1**	16	2.283±0.8692	9.7	<0.001
	Group2	14	0.259±0.1188		

Table(26): comparison between group 1 & group 2 as regards different renal functions variables(s.urea &creatinine and 24 hr urinary protein), with a statistically highly significant differences ($p<0.001$).

Table(27): The drug intake of the studied SLE patients (Doses):

Drug	Number	Dose	Mean ± SD
Oral prednisone(mg/d)	30	10-40	17.83±7.391
Antimalarial(mg/d)	30	200-400	220±61.026
Azathioprine(mg/d)	15	100-150	120±25.68
Cyclophosphamide(mg/pulse)	14	600-800	769.23±75.1

Table (27): shows the **drug history of the studied SLE patients as regards dosage**. **Oral prednisone** dose ranged between 10 – 40 mg/day with a mean of

17.83±7.391 mg/day. **Antimalarial** dose ranged from 200 – 400 mg/day with a mean of 220 ± 61.026 mg/day. **Azathioprine** dose ranged from100- 150 mg/day with a mean of 120 ± 25.68 mg/day. **Intravenous pulse cyclophosphamide** dose ranged from 600 – 800 mg/pulse with a mean of 769.23 ±75.1 mg/pulse.

Table(28): The drug intake of the studied SLE patients (Duration of use):

Drug	Duration (yrs)	Mean ± SD
Oral prednisone	1-10	4.7666 ± 2.635086
Antimalarial	1-10	4.2333 ± 2.661129
Azathioprine	1-10	3.6 ±2.8
Pulse Cyclophosphamide	0.5-2	1.21 ± 0.58

Table (28): presents the **drug history of the studied SLE patients as regards duration of use**. Duration of use of **oral prednisone** ranged between 1 and 10 years with a mean of 4.7666± 2.635086 years. Duration of use of **antimalarial** drugs ranged between 1 and 10 years with a mean of 4.2333±2.661129 years. Duration of use of **azathioprine** ranged between1and 10 years with a mean of 3.6 ± 2.8 years. Duration of use of **intravenous pulse cyclophosphamide** ranged between0.5 and 2 years with a mean of 1.21±0.58 year.

Table (29): correlation between SLEDAI and lipid profile,C3 & C4:

	SLEDAI	
	r	**p**
TC	0.32	0.21
HDL	-0.077	0.68
LDL	0.13	0.47
VLDL	0.901	0.000
TG	0.901	0.000
TC/HDL	0.796	0.000
HDL/LDL	-0.635	0.000
C3	-0.804	0.000
C4	-0.581	0.001

Table (29): shows correlation of **lipid profile** with **SLEDAI** , **C3** & **C4**. There were positive correlations of the SLEDAI with total cholesterol ,triglycerides, LDL-C, VLDL and TC/HDL-C but only TG (r=0.901, p=0.000), VLDL (r=0.901, p=0.000) and TC/HDL-C(r= 0.796 , p=0.000) were significant(highly significant). There were negative correlation with HDL-C, and highly significant negative correlations with HDL/LDL (r=-0.635, p=0.000). There were negative statistically highly significant correlation with C3 (r= -0.804, p= 0.000) and C4 (r=-0.581, p=0.001) .

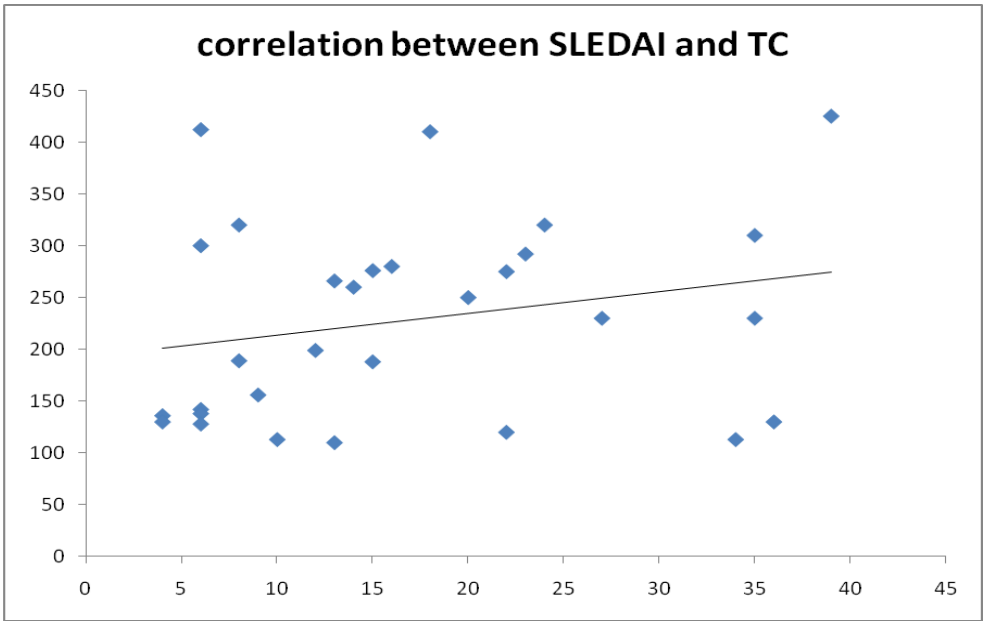

Figure (9): Correlation between SLEDAI and TC.

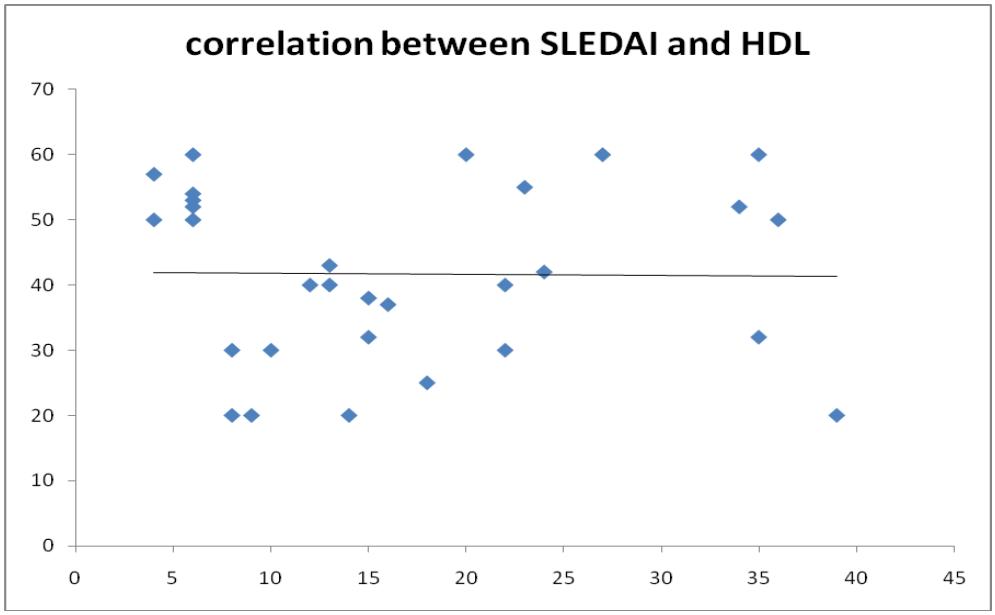

Figure (10): Correlation between SLEDAI and HDL.

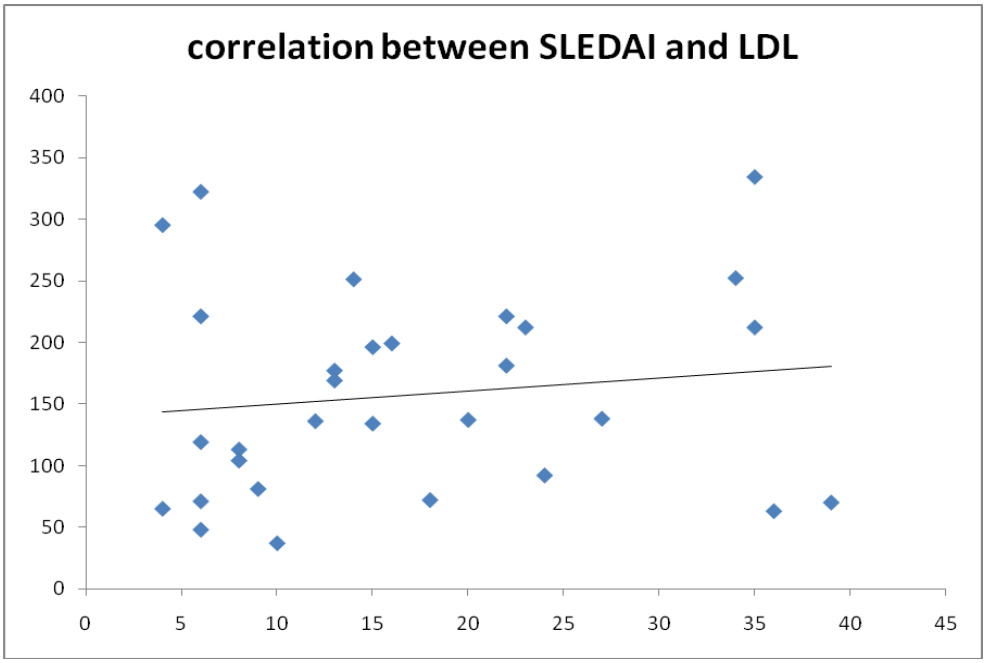

Figure (11): Correlation between SLEDAI and LDL.

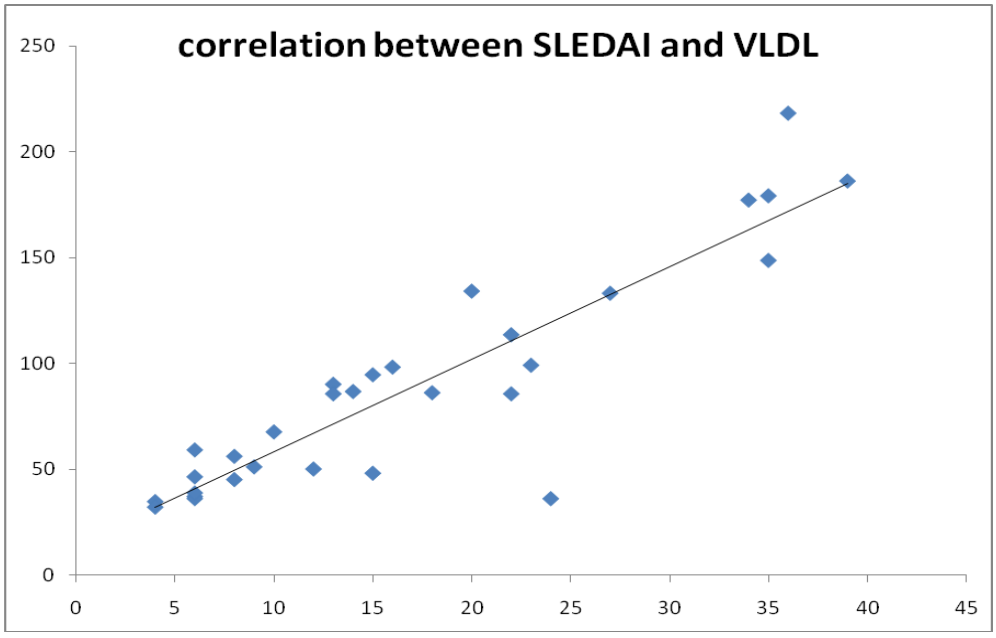

Figure (12): Correlation between SLEDAI and VLDL.

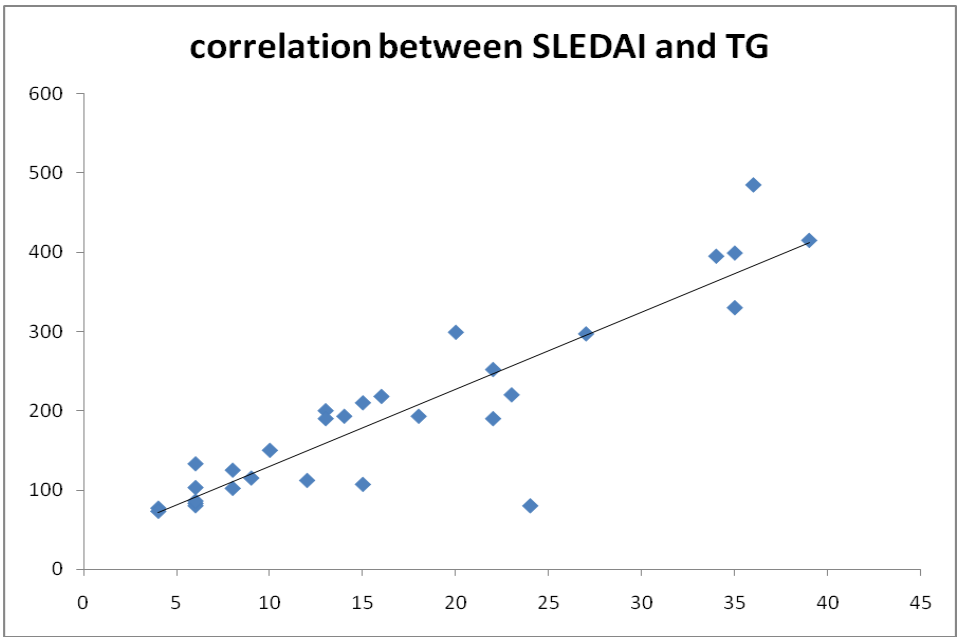

Figure (13): Correlation between SLEDAI and TG.

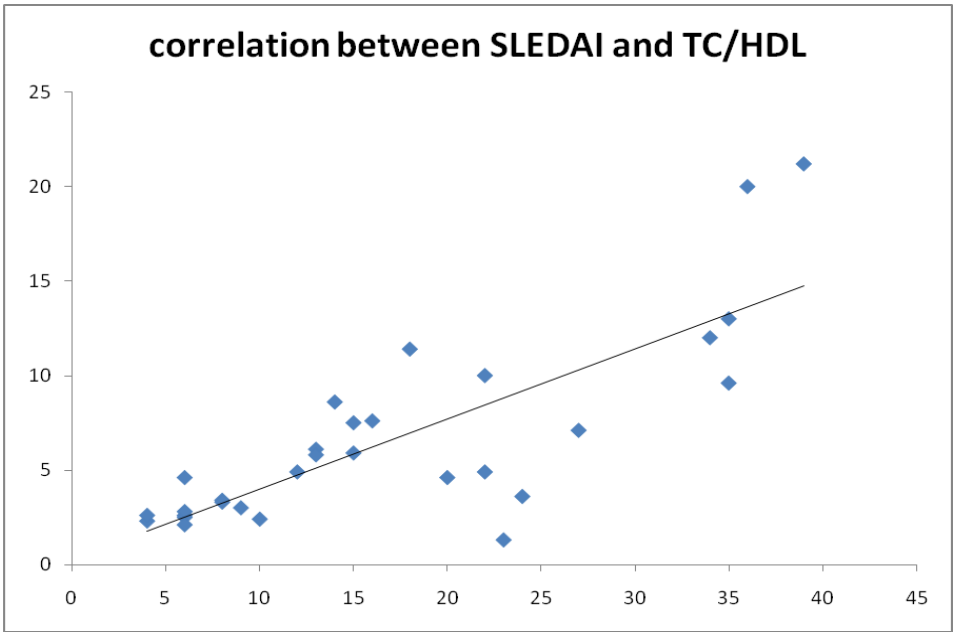

Figure (14): Correlation between SLEDAI and TC/HDL.

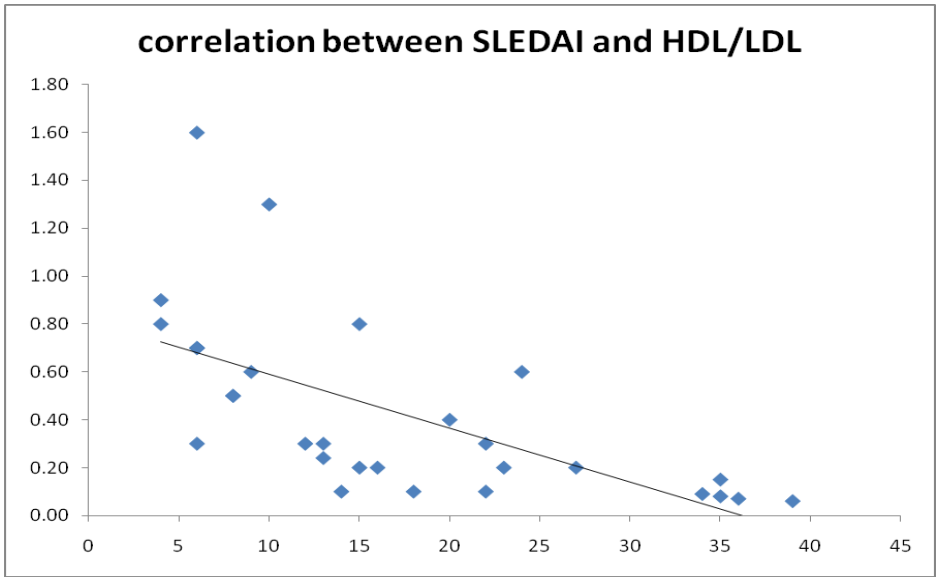

Figure (15): Correlation between SLEDAI and HDL/LDL.

Table(30): Correlation between ESR and Lipid Profile:

Lipid profile	r	p
TC	0.606	0.000
HDL	-0.404	0.027
LDL	0.593	0.001
VLDL	0.596	0.001
TG	0.595	0.001
TC/HDL	0.491	0.006
HDL/LDL	-0.356	0.054

Table (30): correlates **lipid profile** with **ESR**. The correlations were all highly significant except for HDL/LDL ratio which was non-significant. ESR showed a significant positive correlation with TC, LDL, VLDL, TG and TC/HDL ratio. It showed a significant negative correlation with HDL and a non- significant negative correlation with HDL/LDL ratio.

Table(31): correlation between SLICC damage index and lipid profile variables:

	SLICCS	
	r	p
TC	0.661	0.000
HDL	-0.709	0.000
LDL	0.681	0.000
VLDL	0.650	0.000
TG	0.649	0.000
TC/HDL	0.674	0.000
HDL/LDL	-0.581	0.001

Table (31): correlates **lipid profile** with **SLICC** damage index. The correlations were all highly significant. The correlations were positive for TC, LDL, VLDL,TG and TC/HDL ratio, and negative for HDL and HDL/LDL ratio.

Table(32): correlation between complement3, complement4 and lipid profile

	complement3		complement4	
	r	**p**	**r**	**p**
complement3	----	----	0.730	0.000
complement4	0.73	0.000	------	------
TC	-0.735	0.000	-0.483	0.007
HDL	0.646	0.000	0.391	0.033
LDL	-0.729	0.000	-0.476	0.008
VLDL	-0.709	0.000	-0.553	0.002
TG	-0.708	0.000	-0.551	0.002
TC/HDL	-0.637	0.000	-0.444	0.014
HDL/LDL	0.555	0.001	0.184	0.329

Table (32): correlates **lipid profile** with **C3** and **C4**. All correlations were significant except for C4 with HDL/LDL. The correlations were positive for HDL and HDL/LDL ratio and negative for TC, LDL, VLDL, TG and TC/HDL ratio.

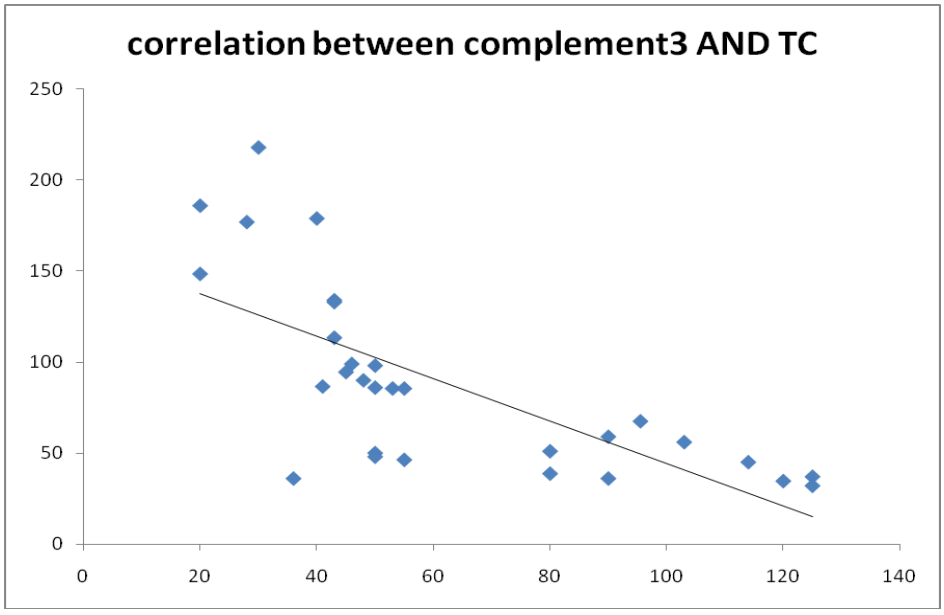

Figure (16): Correlation between C3 & TC.

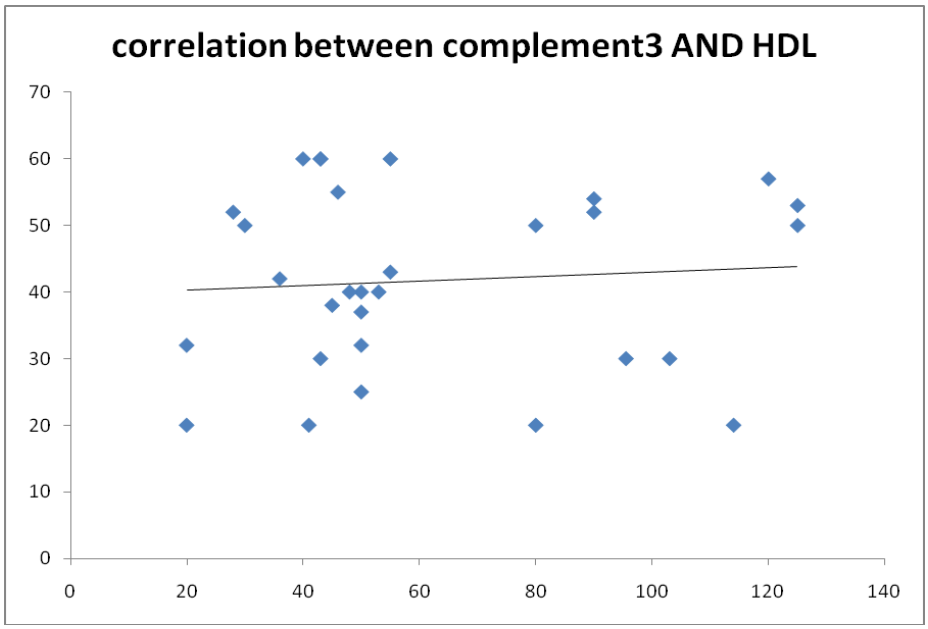

Figure (17): Correlation between C3 & HDL.

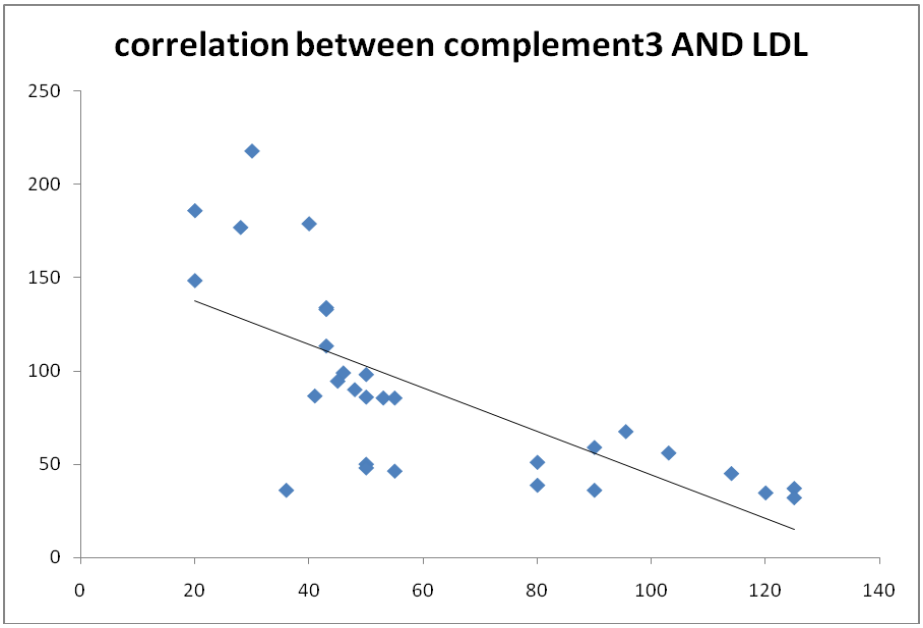

Figure (18): Correlation between C3 & LDL.

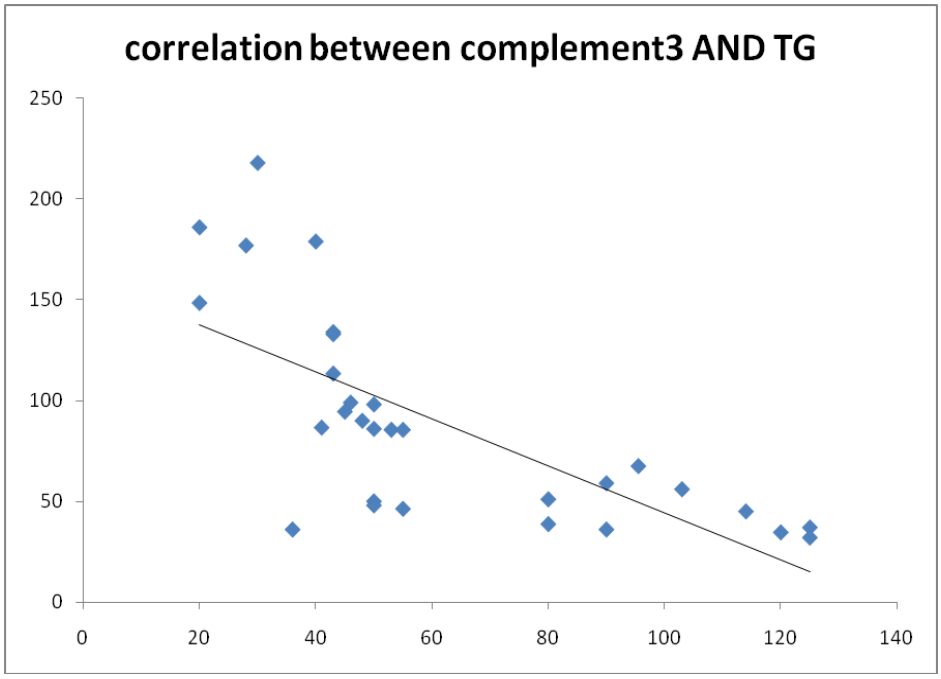

Figure (19): Correlation between C3 & TG.

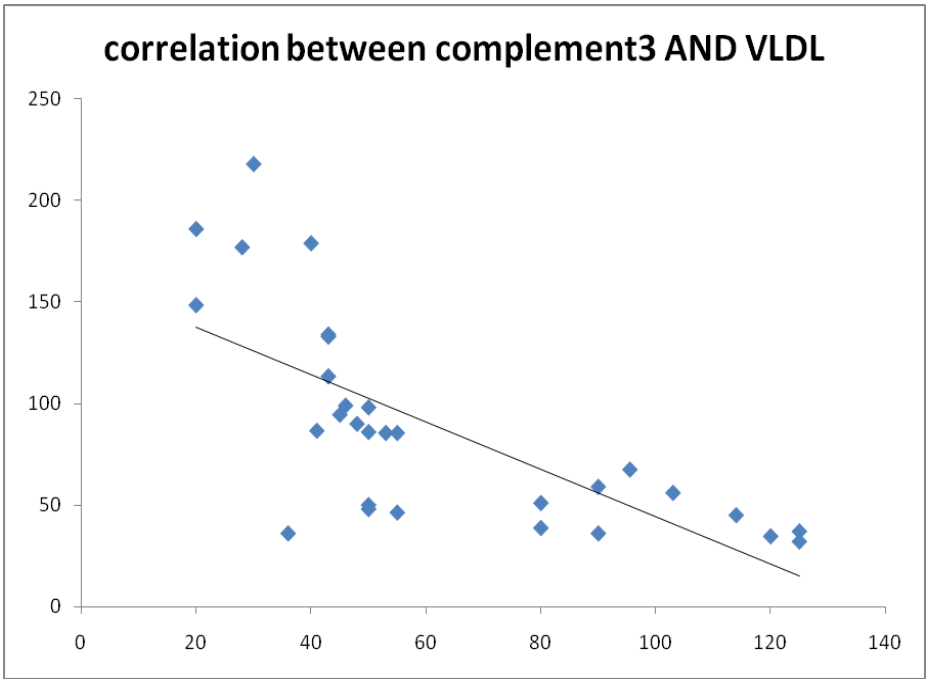

Figure (20): Correlation between C3 & VLDL.

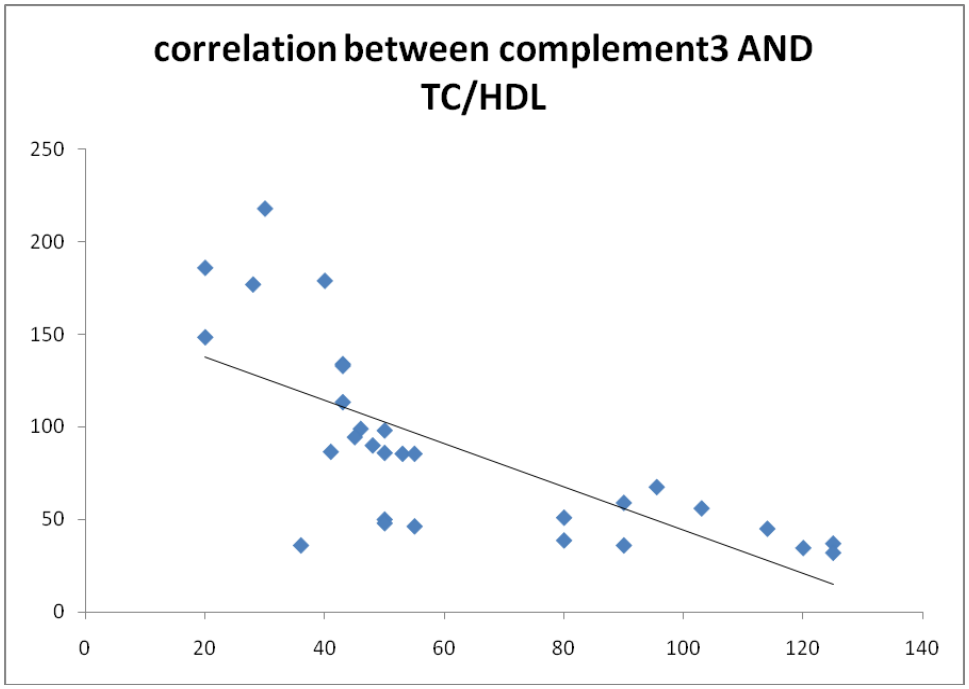

Figure (21): Correlation between C3 & TC/HDL.

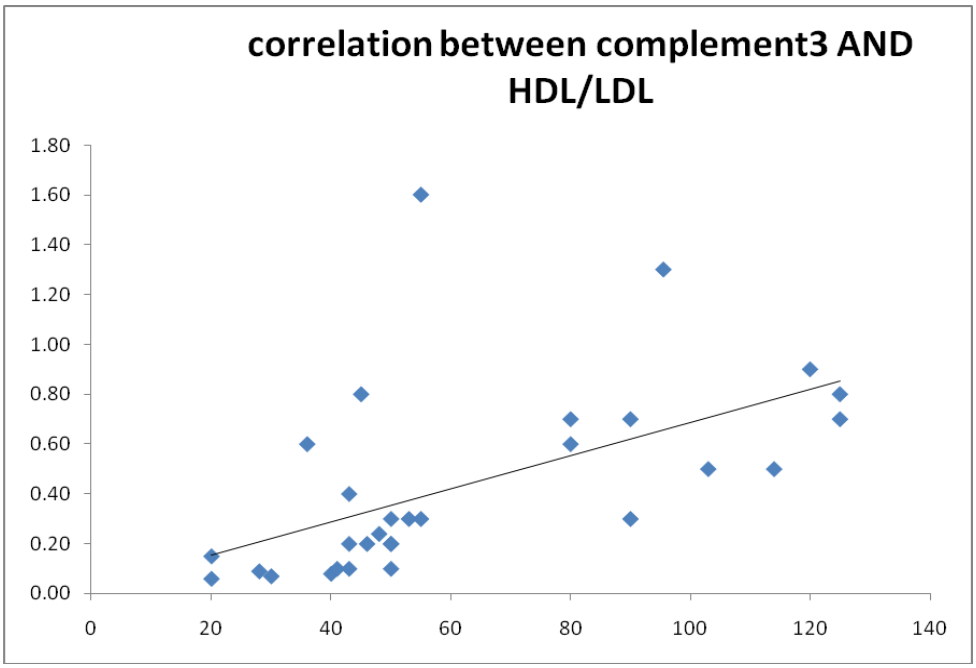

Figure (22): Correlation between C3 & HDL/LDL.

Table (33): Correlation of lipid profile with 24 h urinary protein

	Twenty four hour Protein	
	r	**P**
TC	0.611**	0.000
HDL	-0.588**	0.001
LDL	0.629**	0.000
VLDL	0.585**	0.001
TG	0.584**	0.001
TC/HDL	0.563**	0.001
HDL/LDL	-0.423*	0.020

Table (33): shows the correlation of **lipid profile** with **24 hr urinary protein**. Positive highly significant correlations were found for TC, LDL, VLDL, TG and TC/HDL and negative significant correlations were found for HDL and HDL/LDL ratio.

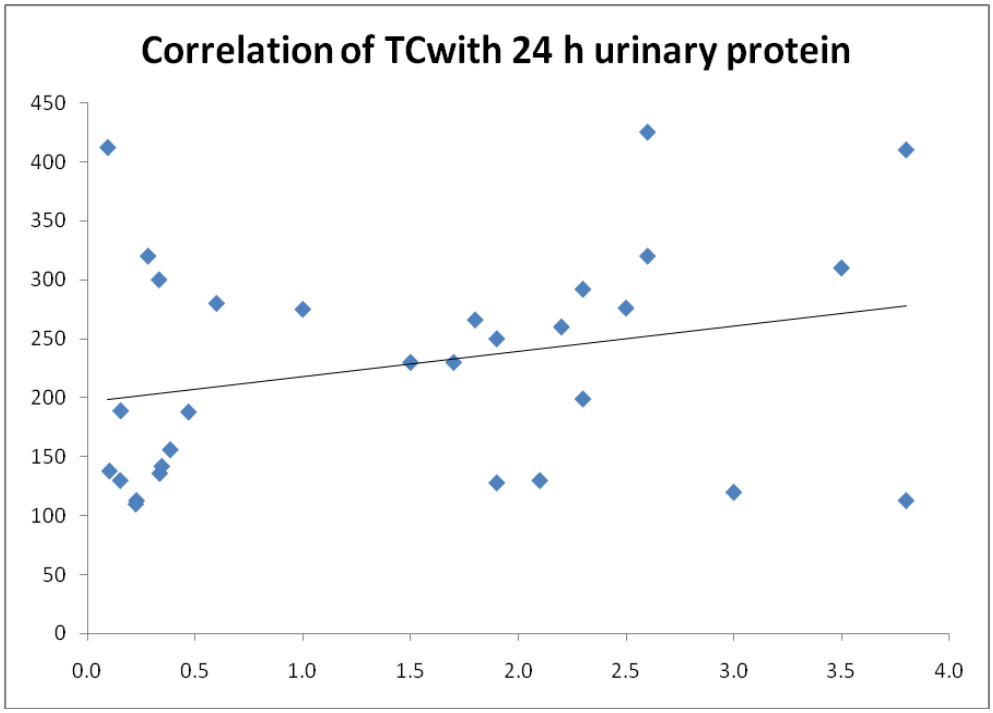

Figure (23):Correlation of TC with 24 h urinary protein

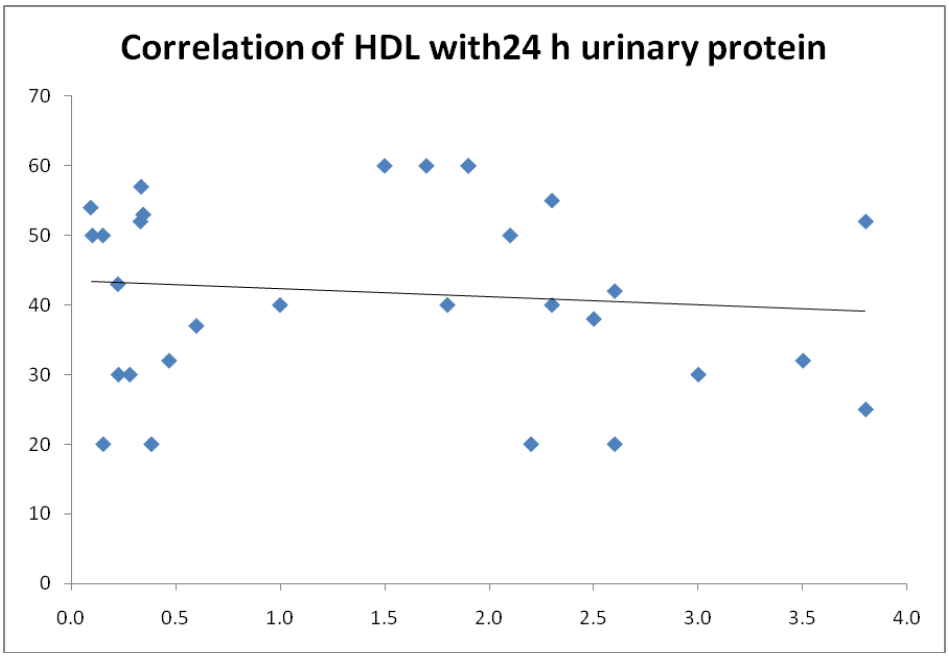

Figure (24):Correlation of HDL with 24 h urinary protein

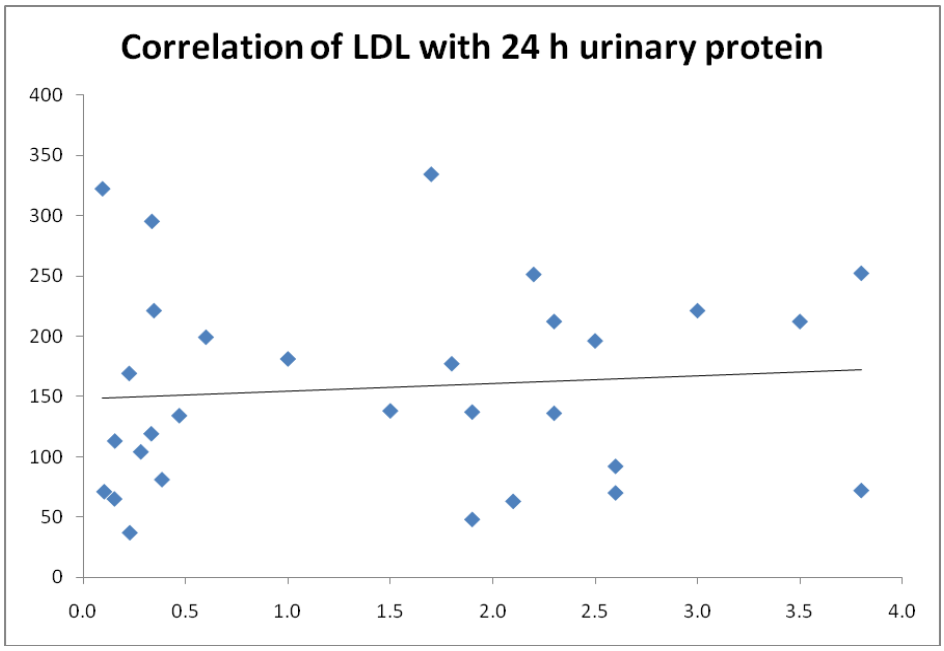

Figure (25):Correlation of LDL with 24 h urinary protein

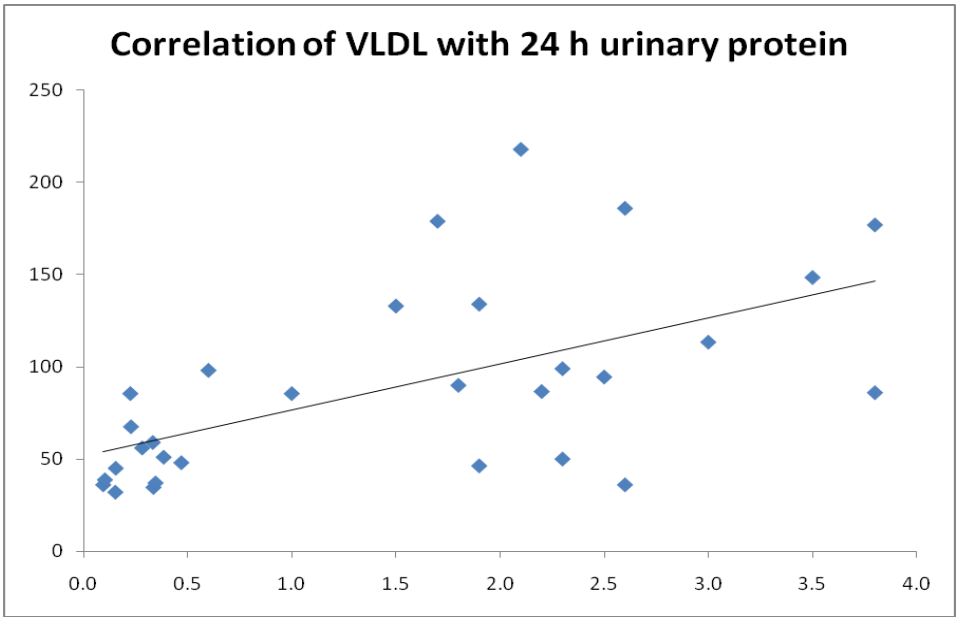

Figure (26):Correlation of VLDL with 24 h urinary protein

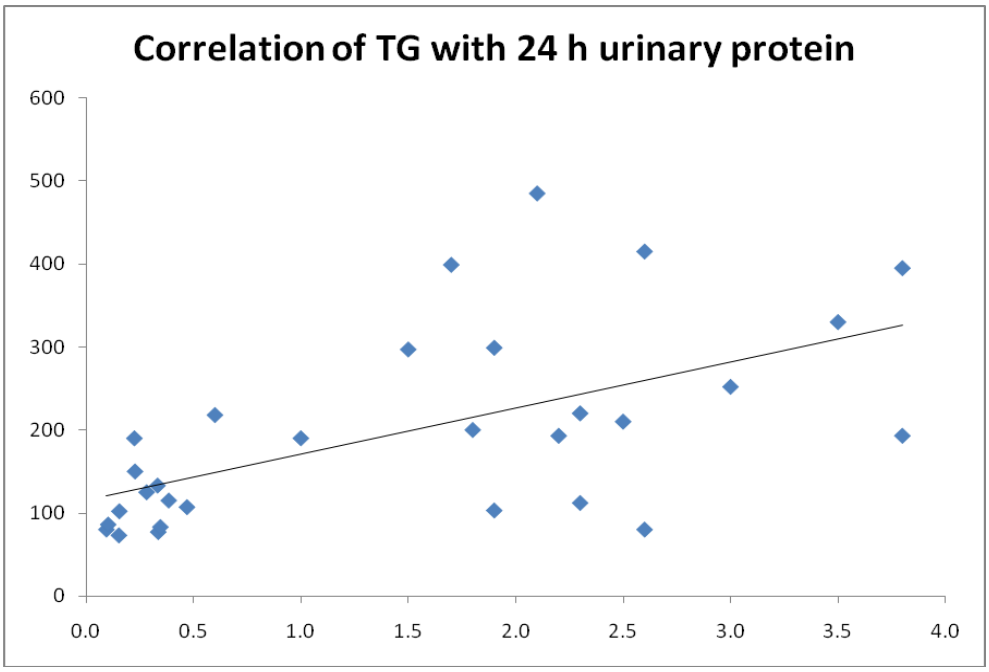

Figure (27):Correlation of TG with 24 h urinary protein

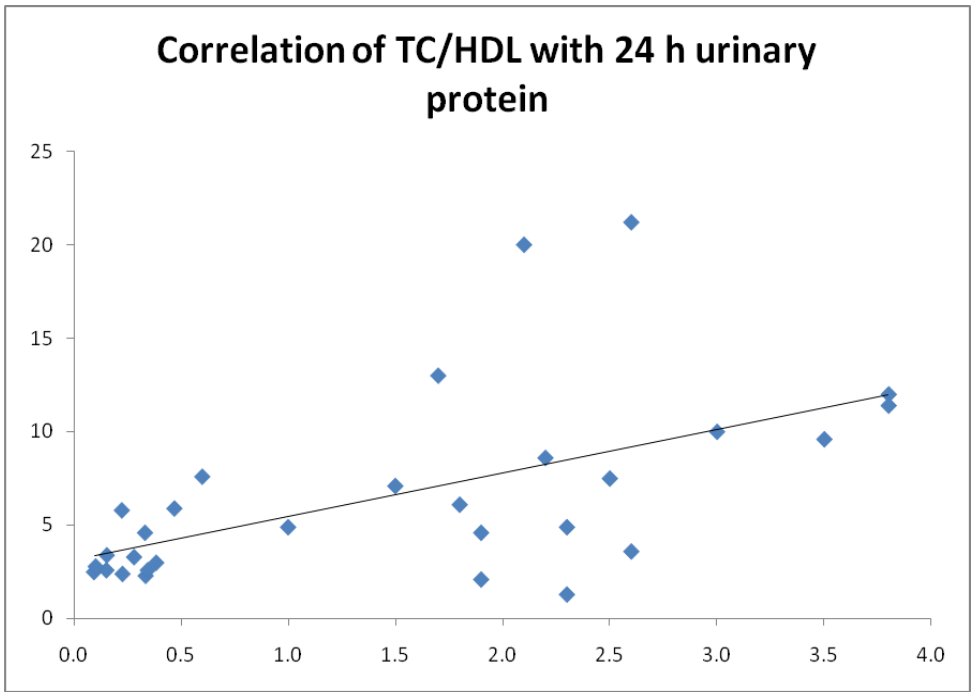

Figure (28):Correlation of TC/HDL with 24 h urinary protein

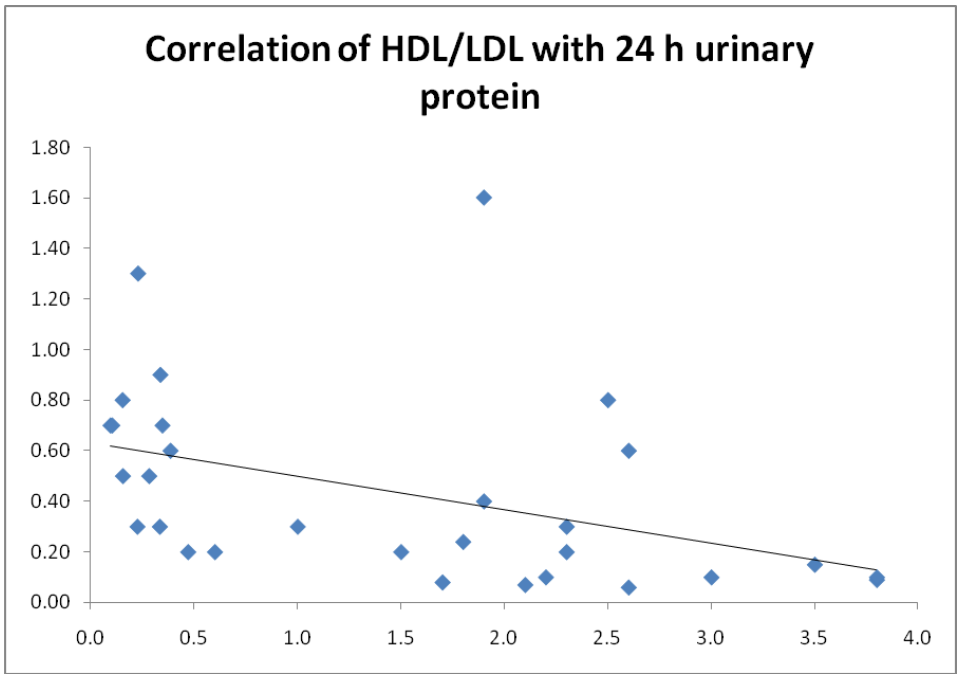

Figure (29):Correlation of HDL/LDL with 24 h urinary protein

Table (34): Correlation of lipid profile with serum creatinine & urea.

	Creatinine		Urea	
	r	**p**	**r**	**p**
Creatinine	----	---	0.908	0.000
Urea	0.908	0.000	----	----
TC	0.675	0.000	0.584	0.001
HDL	-0.571	0.001	-0.559	0.001
LDL	0.675	0.000	0.606	0.000
VLDL	0.623	0.000	0.564	0.001
TG	0.622	0.000	0.563	0.001
TC/HDL	0.595	0.001	0.571	0.001
HDL/LDL	-0.556	0.001	-0.398	0.029

Table (34): presents correlation of **lipid profile** with **serum creatinine** and **urea**. Correlations were highly significantly positive for TC, LDL, VLDL, TG and TC/HDL ratio and significantly negative for HDL and HDL/LDL ratio.

Table (35): correlation of the lipid profile with activity & chronicity scores:

	Activity score		Chronicity score	
	r	**p**	**r**	**p**
TC	0.495	0.037	-0.010	0.970
HDL	-0.379	0.121	-0.026	0.919
LDL	0.444	0.065	-0.032	0.899
VLDL	0.478	0.045	-0.149	0.556
TG	0.478	0.045	-0.149	0.555
TC/HDL	0.388	0.111	-0.053	0.836
HDL/LDL	-0.453	0.059	-0.147	0.560

Table (35): presents correlation of **lipid profile** with **Activity scores** and **Chronicity scores**. The correlation with activity index were significantly positive for TC , VLDL and TG , non-significantly positive for LDL and TC/HDL and non-significantly negative for HDL and HDL/LDL ratio. The correlation with chronicity index were non-significantly negative.

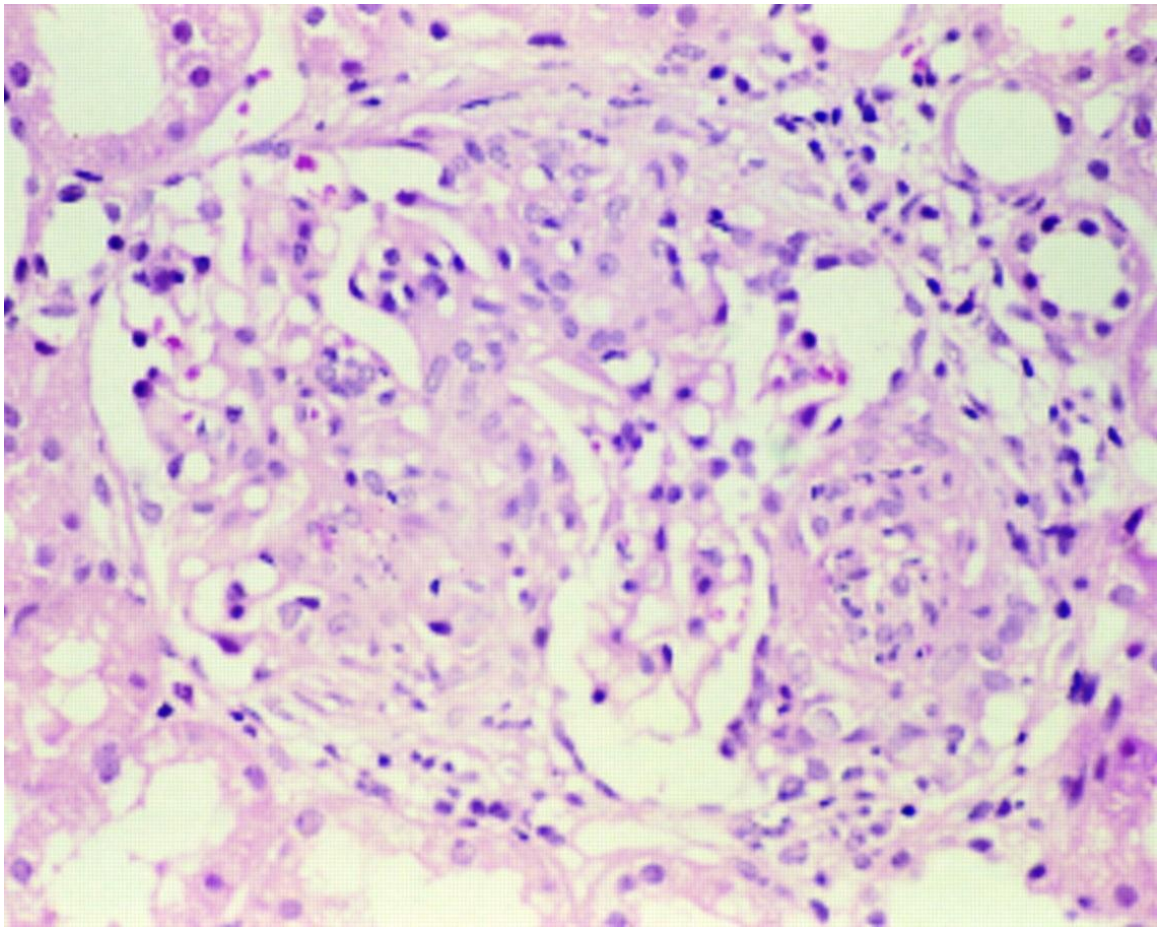

Figure (30):A case of diffuse proliferative lupus nephritis , WHO class IV ***(hematoxylin and eosin stain, original magnification x200)***

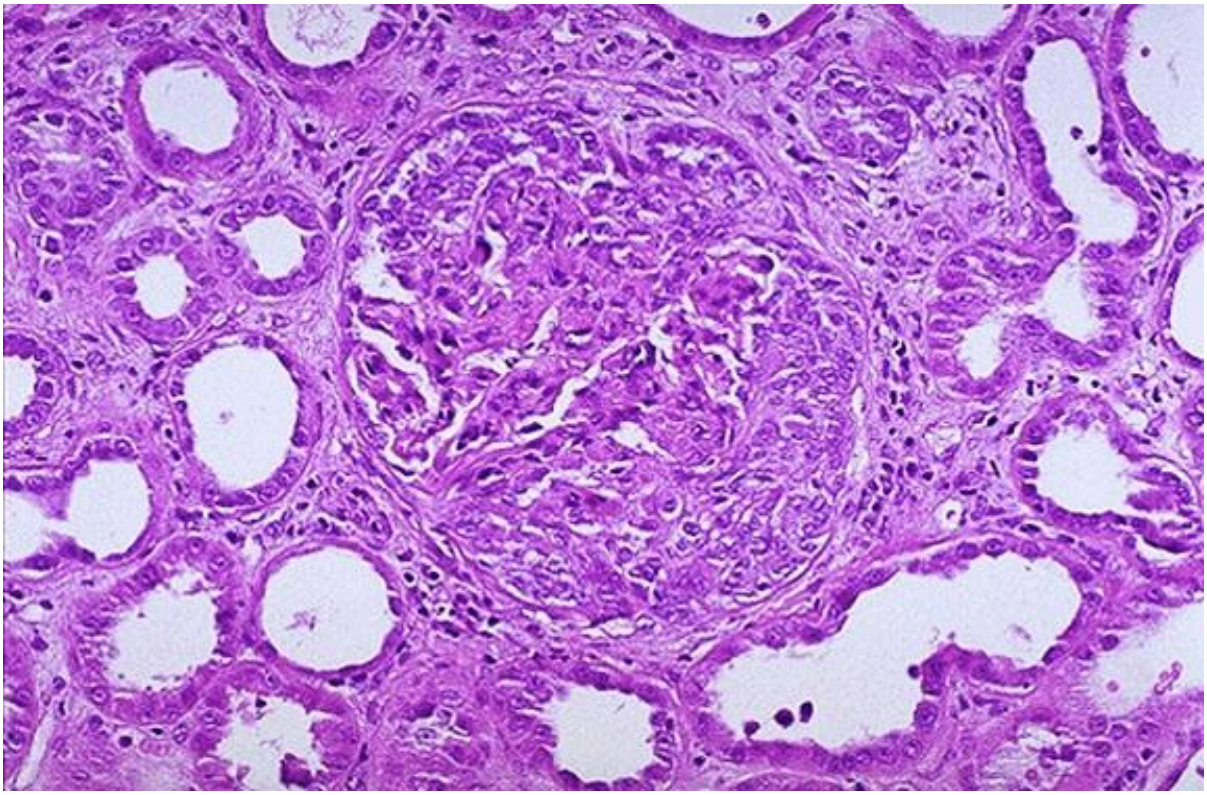

Figure (31):A case of diffuse proliferative lupus nephritis with crescent formation, WHO class IV ***(hematoxylin and eosin stain, original magnification x200)***