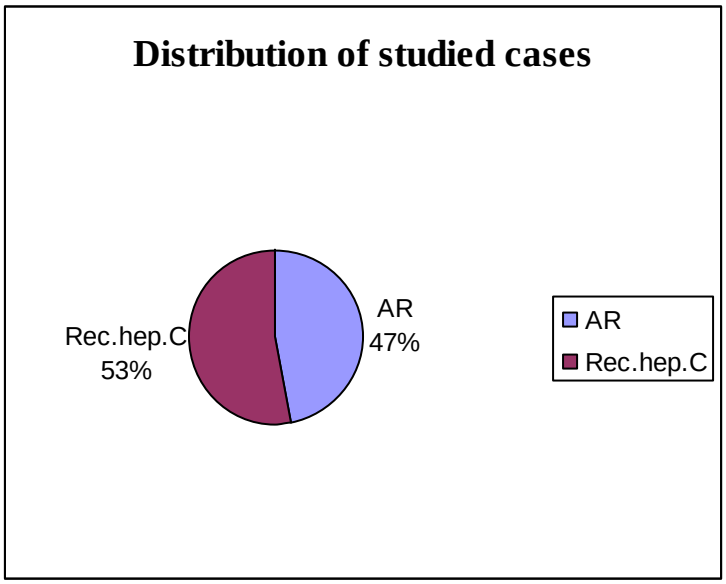
RESULTS

This study was retrospective study of 38 cases underwent liver transplantation, Samples were taken before (donor) and after (recipient) transplantation.

Out of 19 cases:

-Nine cases were diagnosed as acute rejection (AR) (47%)

-Ten cases diagnosed as recurrent hepatitis C (rec.hep C) (53%)



Graph (1): Distributions of studied cases

Regarding pre-transplant cases (donors):

Age distribution of donors:

The ages of all donors are ranged from 18-25 years

Sex of donors:

All the 19 donors were males

By H&E

Routine histopathological sections of the 19 cases showed no significant pathological changes and cheked for:

-Steatosis: 17 case were graded 0 while 2 cases were graded 1 (steatosis <10%) as show in figure 6.

-Portal inflammation: within normal (minimal inflammatory cells in portal tracts) **with no activity** as shown in figure 6**.**

-Spotty necrosis: all were within normal (12 show 1 tiny focus, 8 showed 2 tiny foci)/10 HPF as shown in figure 7.

Immunohistochemical results

In +ve control slides, CD4 and CD8 were both detected as membranous staining.

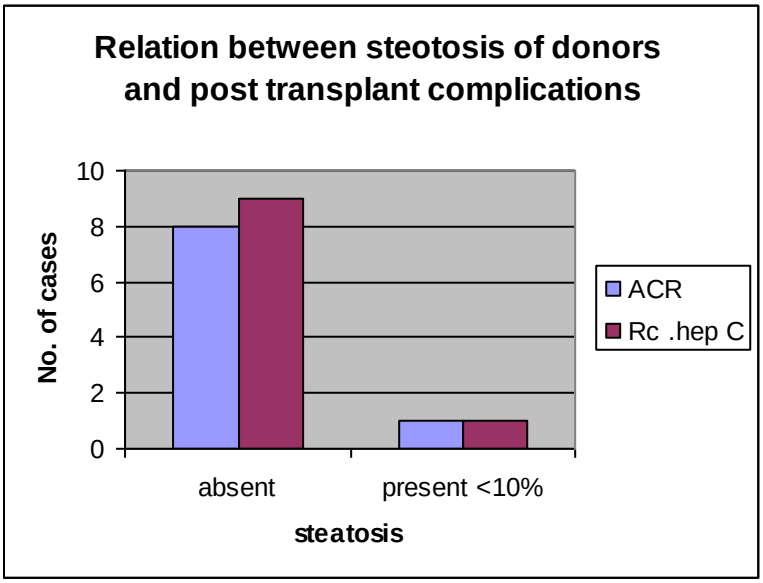
CD4 and CD8 immunostained lymphocytes were present in portal tracts and occasionally in hepatic lobules of the liver tissue of the donors.

Relation between steatosis in donors and post transplant complications

Out of the 19 cases of the donors, 17 cases (90%) showed no steatosis. In their post transplant recipients, 8 cases (47%) showed acute cellular rejection while 9 cases (53%) showed recurrent hepatitis C.The other 2 cases (10%) of the donors showed steatosis <10%(grade 1). In their recipients 1 case (50%) showed acute cellular rejection and the other case (50%) showed recurrent hepatitis C. This is illustrated in table (17) & graph (2)

Table (17): Relation between steatosis of donors and post transplant complications

Steatosis	No. of donors	%	Recipient	
			ACR	Rec .hep C
Absent	17	90	8	9
Present <10%(grade 1)	2	10	1	1



Graph (2): Relation between steatosis of donors and post transplant complications

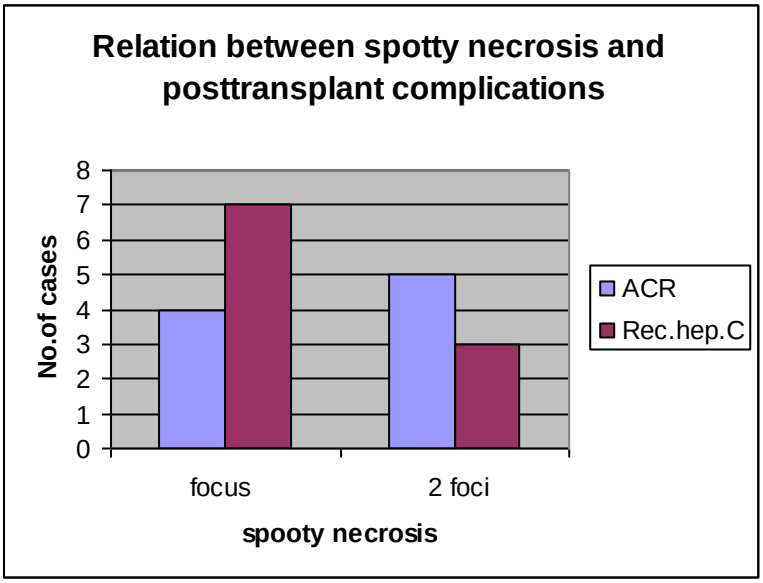
Relation between spotty necrosis in donors and post transplant complications

Out of the 19 cases of the donors, 11 cases (58%) showed 1 focus of spotty necrosis. In their post transplant recipients, 4 cases (36%) showed acute cellular rejection while 7 cases (64%) showed recurrent hepatitis C.

The other 8 cases (42%) of the donors showed 2 foci of spotty necrosis. In their recipients 5 cases (63%) showed acute cellular rejection and the other 3 cases (37%) showed recurrent hepatitis C. This is illustrated in table (18) & graph (3)

Table (18): Relation between spotty necrosis of donors and post transplant complications

Spotty necrosis	No. of donors	%	Recipient	
			ACR	Rec .hep C
1 focus	11	58	4	7
2 foci	8	42	5	3



Graph (3): Relation between spotty necrosis of donors and post transplant complications

Regarding post transplant cases (recipients):

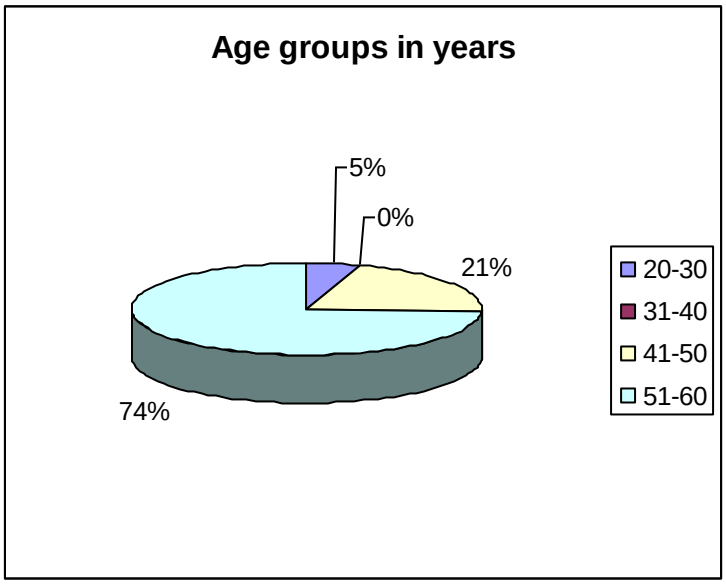
Age distribution of recipients:

Ages of the studied 19 cases of the recipients ranged from 27 years to 58 with mean age 51.4, SD± 18.9 .

Among the recipient cases 1 case (5%) aged between (20-30), no cases (0%) between 31-40, 4 cases (21%) between 41-50 while 13 cases (69%) between 51-60. This is shown in table(19) and graph(4).

Table (19): Age distribution of the recipients:

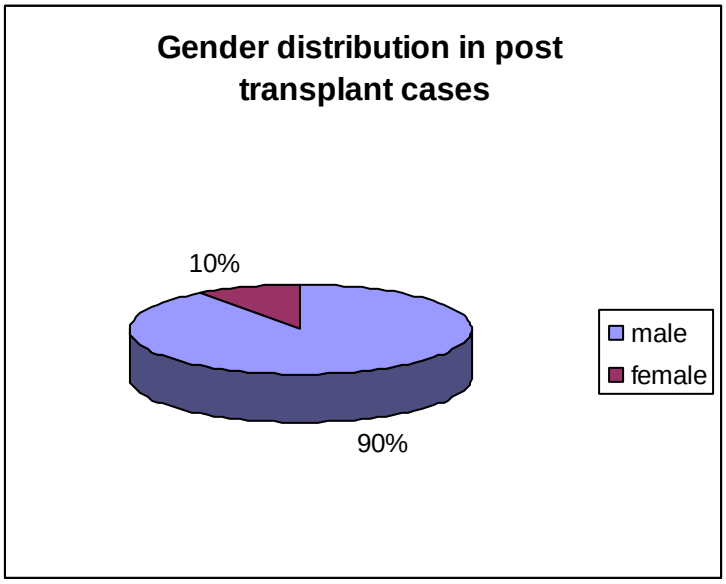
Age group	No .	%
20-30	1	5
31-40	0	0
41-50	4	21
51-60	13	69



Graph (4): Age distribution of recipient cases

Sex of recipients:

Out of 19 cases, 17 cases were males (90%) and 2 cases were females (10%). This is illustrated in graph (5).



Graph (5): Gender distribution in post transplant cases

By H&E:

Regarding post transplant pathology; out of studied 19 cases:

Nine cases (48%) showed endotheliitis of the veins, portal inflammation and bile duct changes and diagnosed as acute cellular rejection as shown in figure 7. Ten cases (52%) showed interface hepatitis, spotty necrosis, portal inflammation and confiluent necrosis and were diagnosed as recurrent hepatitis C and graded as mild(3 cases), moderate(3 cases) and severe recurrent hepatitis(4cases).

Immunohistochemical results:

In +ve control slides CD4 and CD8 are both detected as membranous staining.

CD4 and CD8 immunostained lymphocytes were present in portal tracts and hepatic lobules of the liver tissue of the recipients.

Correlation between mean ratio of CD8 +ve cells/ all lymphocytes in *portal tracts* and severity of acute rejection in donors:

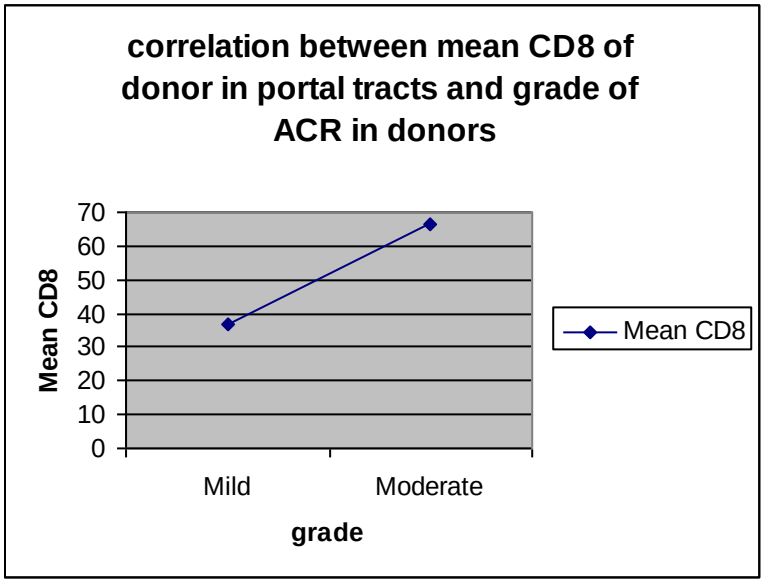
Out of the 9 cases of acute cellular rejection, 4 cases were graded as mild rejection (44.4%) and 5 cases graded as moderate rejection (55.5%). While, no case graded as severe rejection according to **Banff schema 1997**.

There was gradual increase in the ratio of CD8+ to all lymphocytes with increase the grade of rejection as in mild cases the ratio of CD8+ cells to all lymphocytes was ranged from 0 to 54% with mean of 37.05% ±25.19.In moderate cases the ratio of CD8+ cells to all lymphocytes ranged from 58 to 70% with mean of 66.6% ±4.76.

There was statistically significant positive correlation between mean CD8+ in portal tracts and severity of acute cellular rejection(RAI) (p=0.01).This is illustrated in table (20) & graph (6):

Table (20)*: *Correlation between mean CD8 +ve cells/ all lymphocytes in portal tracts and severity of acute rejection in donors

RAI	NO.	range	mean	±sd	P value
Mild Moderate	4 5	0-54% 58-70%	37.05 66.62	25.19 4.76	P=0.01 (Highly significant positive correlation)
TOTAL	9	0-70%	53.4778	22.1724	



Graph (6): Correlation between mean CD8 +ve cells/ all lymphocytes and severity of acute rejection in donors

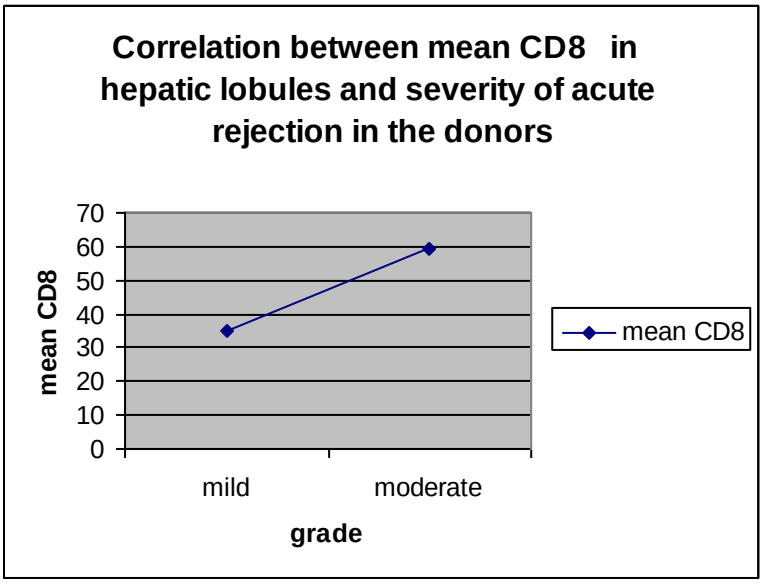
Correlation between mean ratio of CD8 +ve cells/ all lymphocytes in *hepatic lobules* and severity of acute rejection in donors:

In mild cases the ratio of CD8+ cells to all lymphocytes was ranged from 0 to 98% with mean of 35.27% ±44.89. In moderate cases the ratio of CD8+ cells to all lymphocytes was ranged from 13 to 81% with mean of 59.2% ±27.45

There was NO statistically significant correlation between mean CD8 in hepatic lobules and severity of acute cellular rejection (RAI) (p=0.430) This is illustrated in table (21) & graph (7):

Table (21): Correlation between mean CD8 +ve cells/ all lymphocytes in hepatic lobules and severity of acute rejection in donors

RAI	NO.	range	mean	±sd	P value
Mild Moderate	4 5	0-98% 13-81%	35.27 59.24	44.89 27.45	P=0.430 Non significant
TOTAL	9	0-98%	48.58	35.94	



Graph (7): Correlation between mean CD8 +ve cells/ all lymphocytes in hepatic lobules and severity of ACR in donors

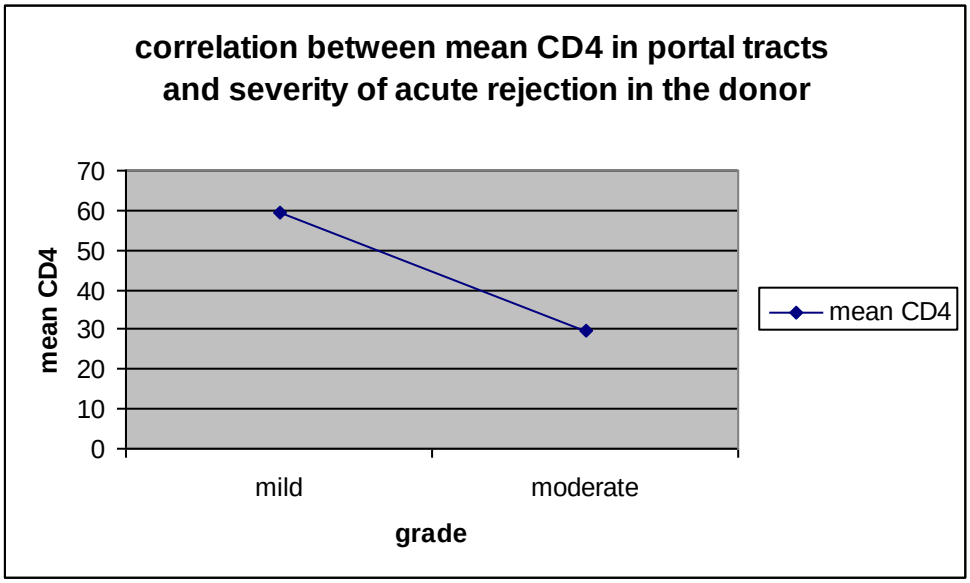
Correlation between mean ratio of CD4 +ve cells/ all lymphocytes in *portal tracts* and severity of acute rejection in donors:

There was gradual decrease in the ratio of CD4+ to all lymphocytes with the increase with grade of ACR as in mild cases the ratio of CD4+ cells to all lymphocytes is ranged from 26 to 90% with mean of 59.67%±28.21. In moderate cases the ratio of CD4+ cells to all lymphocytes ranged from 25 to 35% with mean of 29.6%±3.38

There was a statistically significant **inverse** correlation between mean CD4 in portal tracts and severity of acute cellular rejection (RAI) (p=0.05)
This is illustrated in table (22) & graph (8):

Table (22): Correlation between mean CD4 +ve cells/ all lymphocytes in portal tracts and severity of acute rejection in donors

RAI	NO.	range	mean	±sd	P value
Mild Moderate	4 5	36-90% 25-35%	59.67 29.66	28.21 3.38	P=-0.05 Significant inverse correlation
TOTAL	9	25 -90%	43.00	23.55	



Graph (8): Correlation between mean CD4 +ve cells/ all lymphocytes in portal tracts and severity of acute rejection in donors

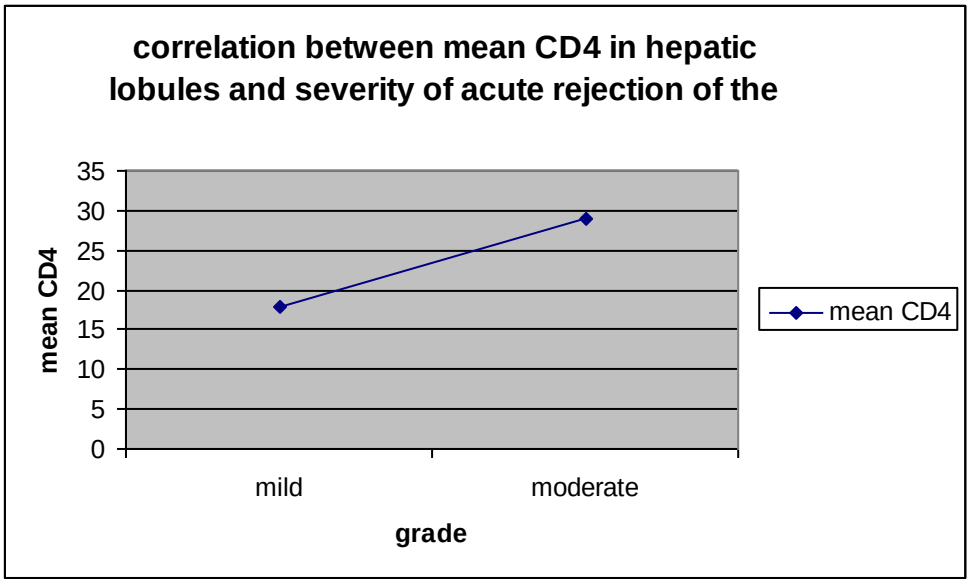
Correlation between mean ratio of CD4 +ve cells/ all lymphocytes in *hepatic lobules* and severity of acute rejection in donors:

In mild cases the ratio of CD4+ cells to all lymphocytes was ranged from 0 to 31% with mean of 18%±15. In moderate cases the ratio of CD4+ cells to all lymphocytes was ranged from 18 to 41% with mean of 28.98±8

There was NO statistically significant correlation between mean CD4 in hepatic lobules and severity of acute cellular rejection (RAI) (p=0.273) This is illustrated in table (23) & graph (9):

Table (23): Correlation between mean CD4 +ve cells/ all lymphocytes in hepatic lobules and severity of acute rejection in the donors

RAI	NO.	range	mean	±sd	P value
Mild Moderate	4 5	0-31% 18-41%	18.00 28.98	15.12 8.80	P=0.273 Non significant correlation
TOTAL	9	0-41%	24.10	12.56	



Graph (9): Correlation between mean CD4 +ve cells/ all lymphocytes in hepatic lobules and severity of acute rejection in donors

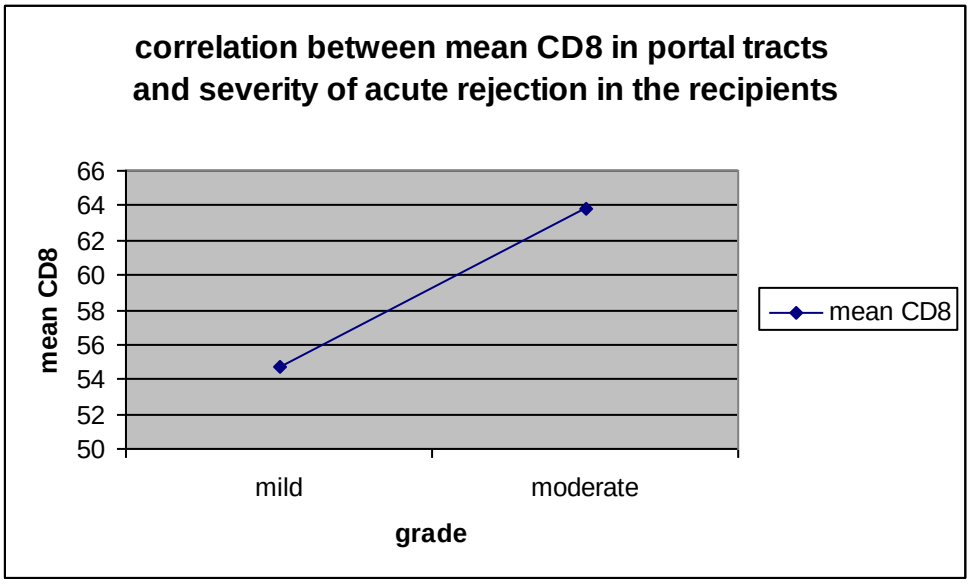
Correlation between mean ratio of CD8 +ve cells/ all lymphocytes in *portal tracts* and severity of acute rejection in recipients:

There was gradual increase of the ratio of CD8+ /all lymphocytes with the increase of the grade of ACR as in mild cases the ratio of CD8+ cells to all lymphocytes was ranged from 53 to 56% with mean of 54.75%±1.75. In moderate cases the ratio of CD8+ cells to all lymphocytes was ranged from 59 to 70% with mean of 63.8%±5.26

There was statistically highly significant positive correlation between mean CD8 in portal tracts and severity of acute cellular rejection (RAI) (p=0.01)
This is illustrated in table (24) & graph (10):

Table (24): Correlation between mean CD8 +ve cells/ all lymphocytes in portal tracts and severity of acute rejection in the donors

RAI	NO.	range	mean	±sd	P value
Mild Moderate	4 5	53-56% 59-70%	54.75 63.80	1.75 5.26	P=0.01 Highly significant positive correlation
TOTAL	9	53-70%	59.77	6.14	



Graph (10): Correlation between mean CD8 +ve cells/ all lymphocytes and severity of acute rejection in recipients

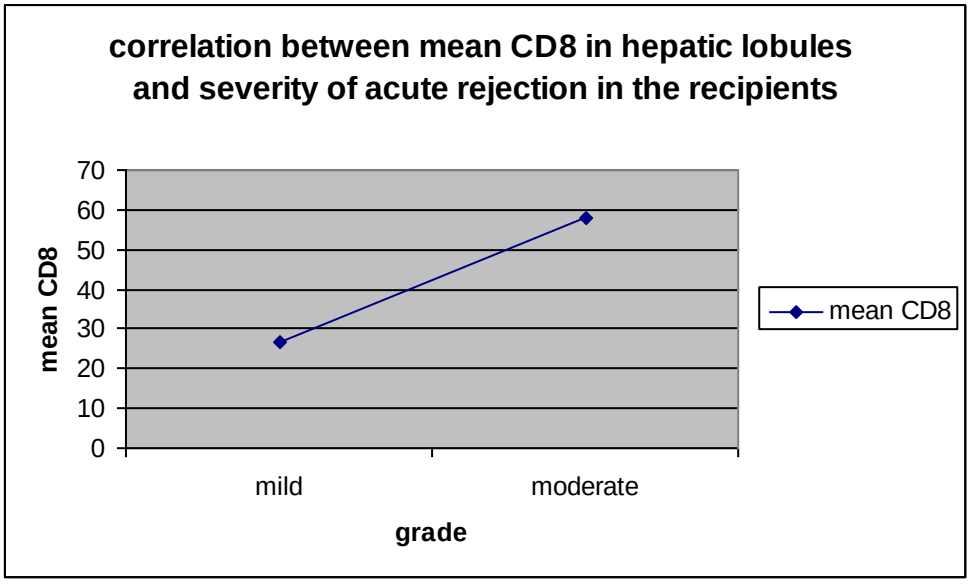
Correlation between mean ratio of CD8 +ve cells/ all lymphocytes in *hepatic lobules* and severity of acute rejection in recipients:

In mild cases the ratio of CD8+ cells to all lymphocytes was ranged from 6 to 53% with mean of 26.75%±20.51. In moderate cases the ratio of CD8+ cells to all lymphocytes was ranged from 17 to 80% with mean of 57.9%±24.35

There was NO statistically significant correlation between mean CD8 in hepatic lobules and severity of acute cellular rejection (RAI) (p=0.074) This is illustrated in table (25) & graph (11):

Table (25): Correlation between mean CD8 +ve cells/ all lymphocytes in hepatic lobules and severity of acute rejection in recipients

RAI	NO.	range	mean	±sd	P value
Mild Moderate	4 5	6-53% 17-80%	26.75 57.90	20.51 24.35	P=0.074 Non significant
TOTAL	9	6-80%	44.05	26.90	



Graph (11): Correlation between mean CD8 +ve cells/ all lymphocytes in hepatic lobules and severity of ACR in recipients.

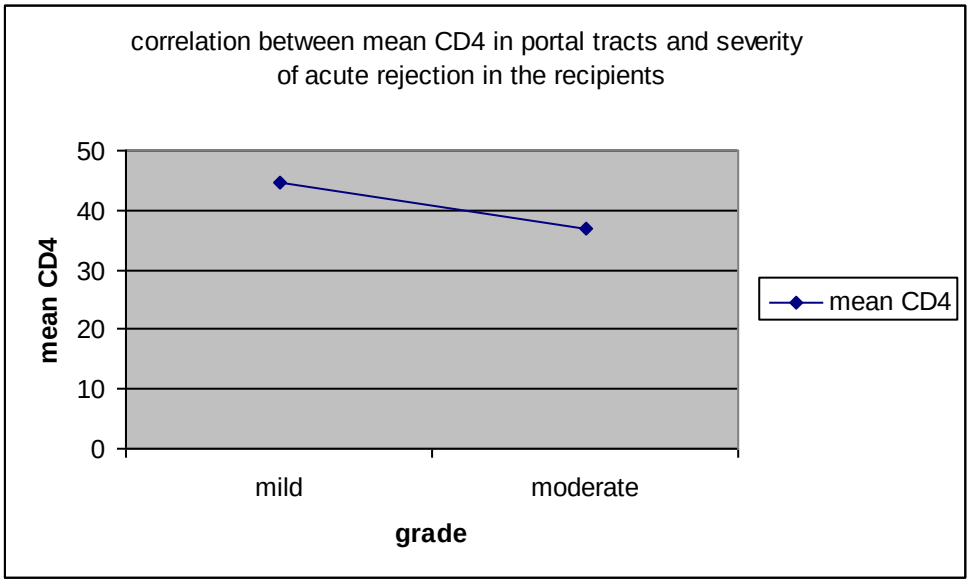
Correlation between mean ratio of CD4 +ve cells/ all lymphocytes in *portal tracts* and severity of acute rejection in recipients:

There was gradual decrease in the ratio of CD4+ to all lymphocytes with the increase in the grade of ACR as in mild cases the ratio of CD4+ cells to all lymphocytes is ranged from 43 to 46% with mean of 44.7%±1.19. In moderate cases the ratio of CD4+ cells to all lymphocytes ranged from 29 to 40% with mean of 36%±5.56

There was statistically significant **inverse** correlation between mean CD4 in portal tracts and severity of acute cellular rejection (RAI) (p=0.01)
This is illustrated in table (26) & graph (12):

Table (26): Correlation between mean CD4 +ve cells/ all lymphocytes in portal tracts and severity of acute rejection in the recipients

RAI	NO.	range	mean	±sd	P value
Mild Moderate	4 5	43-46% 29-40%	44.75 36.00	1.19 5.56	P=0.01 Significant inverse correlation
TOTAL	9	29-46%	39.88	6.10	



Graph (12): Correlation between mean CD4 +ve cells/ all lymphocytes in portal tracts and severity of acute rejection in recipients

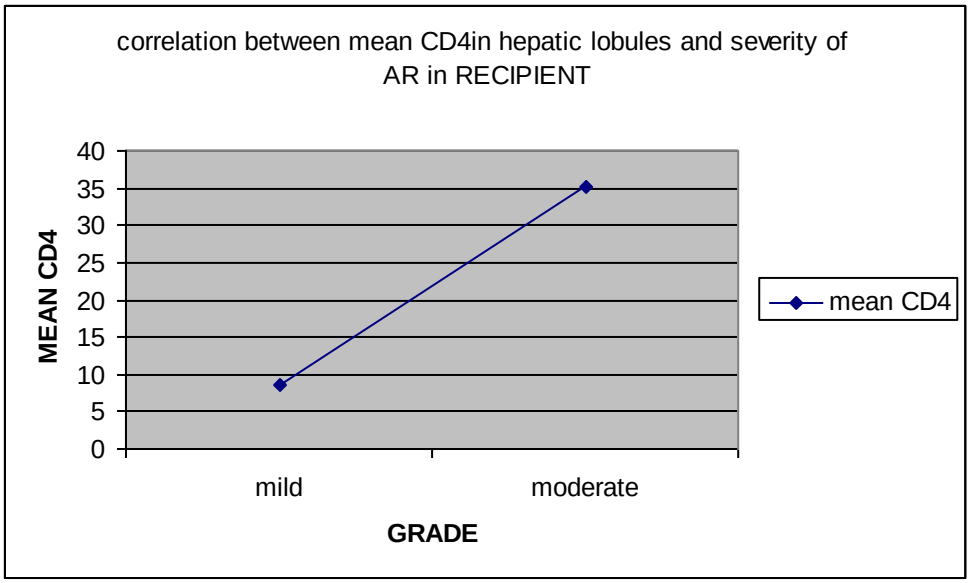
Correlation between mean ratio of CD4 +ve cells/ all lymphocytes in *hepatic lobules* and severity of acute rejection in recipients:

-In mild cases the ratio of CD4+ cells to all lymphocytes was ranged from 0 to 32% with mean of 8.5%±15.69. In moderate cases the ratio of CD4+ cells to all lymphocytes is ranged from 18 to 56% with mean of 35.2%±14.65

There was NO statistically significant correlation between mean CD4 in hepatic lobules and severity of acute cellular rejection(RAI) (p=0.623) This is illustrated in table (27) & graph (13):

Table (27): Correlation between mean CD4 +ve cells/ all lymphocytes in hepatic lobules and severity of acute rejection in recipients

RAI	NO.	range	mean	±sd	P value
Mild Moderate	4 5	0-32% 18-56%	8.50 35.20	15.69 14.65	P=0.623 Non significant
TOTAL	9	0-56%	23.33	19.94	



Graph (13): Correlation between mean CD4 +ve cells/ all lymphocytes in hepatic lobules and severity of acute rejection in the recipients

Correlation between mean ratio of CD8 +ve cells/ all lymphocytes in *portal tracts* and grade of recurrent hepatitis C in donors:

Out of the 10 cases of recurrent hepatitis C, 3 cases were graded as mild hepatitis (30%) , 3 cases graded as moderate hepatitis(30%) and 4 cases graded as severe hepatitis (40%)

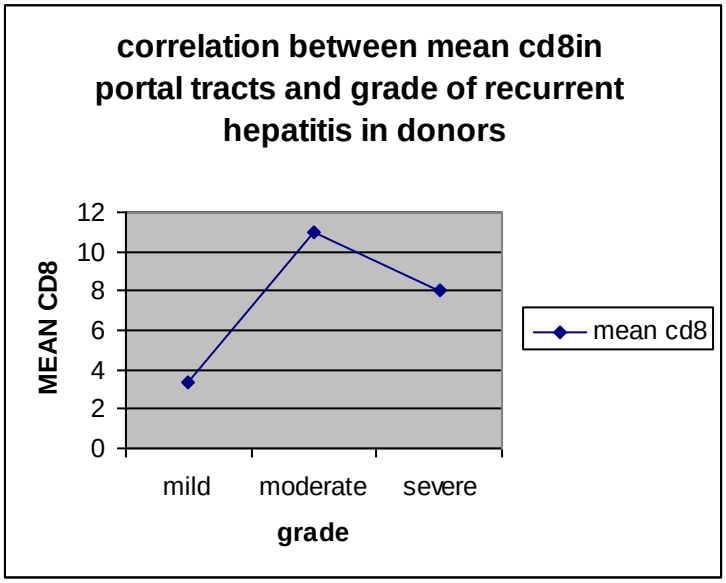
-In mild cases the ratio of CD8+ cells to all lymphocytes was ranged from 0 to 10% with mean of 3.3%±5.77. In moderate cases the ratio of CD8+ cells to all lymphocytes was ranged from 0 to 31% with mean of 11%±17.34 and in severe cases the ratio of CD8+ cells to all lymphocytes was ranged from 0 to 30% with mean of 8%±14.69

There was NO statistically significant correlation between mean CD8 in portal tracts and grade of recurrent hepatitis (p value=0.685)

This is illustrated in table (28) & graph (14):

Table (28): Correlation between mean CD8 +ve cells/ all lymphocytes in portal tracts and grade of recurrent hepatitis in donors

grade	NO.	range	mean	±sd	P value
Mild Moderate severe	3 3 4	0-10% 0-31% 0-30%	3.33 11.00 8.00	5.77 17.34 14.69	P=0.685 Non significant
TOTAL	10	0-31%	7.50	12.50	



Graph (14): Correlation between mean CD8 +ve cells/ all lymphocytes in portal tracts and grade of recurrent hepatitis in donors

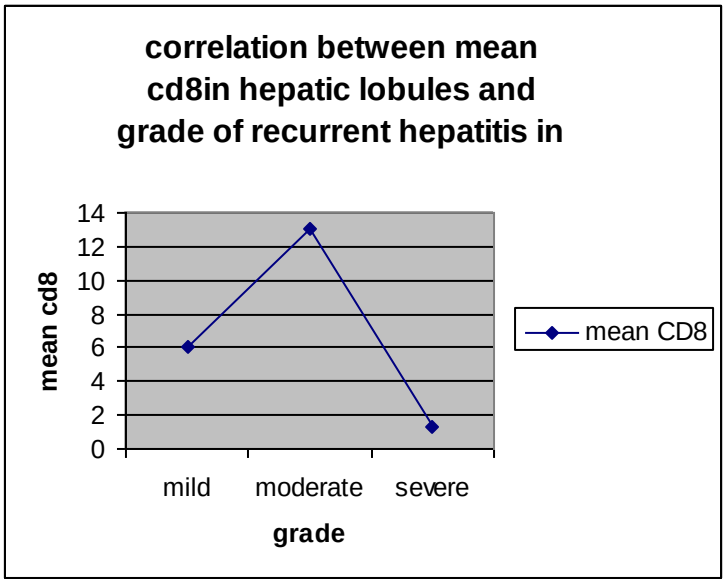
Correlation between mean ratio of CD8 +ve cells/ all lymphocytes in hepatic lobules and grade of recurrent hepatitis C in donors:

In mild cases the ratio of CD8+ cells to all lymphocytes was ranged from 0 to 18% with mean of 6%±10.39. In moderate cases the ratio of CD8+ cells to all lymphocytes was ranged from 0 to 20% with mean of 13%±11.26 and in severe cases the ratio of CD8+ cells to all lymphocytes is ranged from 0 to 3% with mean of 1.25%±1.50

There was NO statistically significant correlation between mean CD8 in portal tracts and grade of recurrent hepatitis (p value=0.444) .This is illustrated in table (29) & graph (15):

Table (29): Correlation between mean CD8 +ve cells/ all lymphocytes in hepatic lobules and grade of recurrent hepatitis in donors

grade	NO.	range	mean	±sd	P value
Mild Moderate severe	3 3 4	0-18% 0-20% 0-3%	6.00 13.00 1.25	10.39 11.26 1.50	P=0.444 Non significant
TOTAL	10	0-20%	6.20	8.90	



Graph (15): Correlation between mean CD8 +ve cells/ all lymphocytes in hepatic lobules and grade of recurrent hepatitis in donors

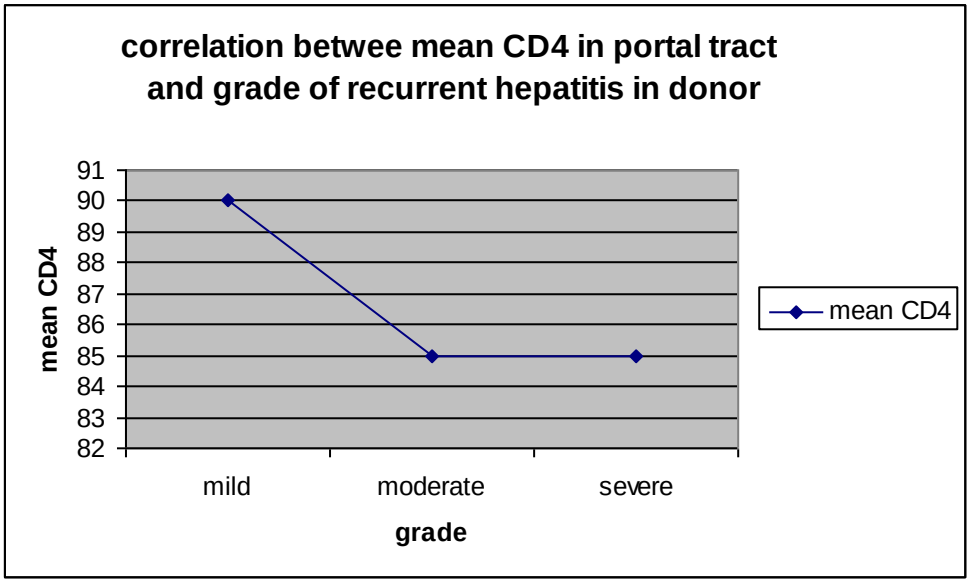
Correlation between mean ratio of CD4 +ve cells/ all lymphocytes in *portal tracts* and grade of recurrent hepatitis C in donors:

In mild cases the ratio of CD4+ cells to all lymphocytes was ranged from 70 to 98% with mean of 90%±17.32. In moderate cases the ratio of CD4+ cells to all lymphocytes is ranged from 75 to 95 % with mean of 85%±13.22 and in severe cases the ratio of CD4+ cells to all lymphocytes is ranged from 60 to 90% with mean of 85%±19.14

There was NO statistically significant correlation between mean CD4 in portal tracts and grade of recurrent hepatitis (p value=0.706). This is illustrated in table (30) & graph (16):

Table (30): Correlation between mean CD4 +ve cells/ all lymphocytes in portal tracts and grade of recurrent hepatitis in donors

grade	NO.	range	mean	±sd	P value
Mild Moderate severe	3 3 4	70-98% 75-95% 60-90%	90.00 85.00 85.00	17.32 13.22 19.14	P=0.706 Non significant
TOTAL	10	60-98%	86.00	15.28	



Graph (16): Correlation between mean CD4 +ve cells/ all lymphocytes in portal tracts and grade of recurrent hepatitis in donors

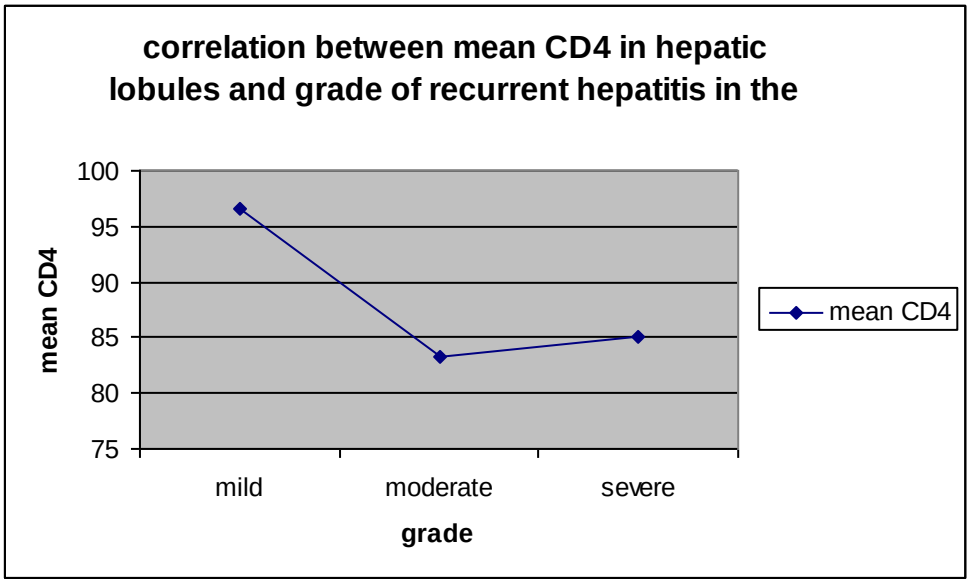
Correlation between mean ratio of CD4+ve cells/ all lymphocytes in *hepatic lobules* and grade of recurrent hepatitis C in donors:

In mild cases the ratio of CD4+ cells to all lymphocytes was ranged from 90 to 99% with mean of 96.6%±5.77. In moderate cases the ratio of CD4+ cells to all lymphocytes was ranged from 60 to 90% with mean of 83.3%±20.81 and in severe cases the ratio of CD8+ cells to all lymphocytes was ranged from 70 to 95% with mean of 85%±17.32

There was NO statistically significant correlation between mean CD4 in hepatic lobules and grade of recurrent hepatitis (p value=0.381). This is illustrated in table (31) & graph (17):

Table (31): Correlation between mean CD4 +ve cells/ all lymphocytes in hepatic lobules and grade of recurrent hepatitis in donors

grade	NO.	range	mean	±sd	P value
Mild Moderate severe	3 3 4	90-99% 60-90% 70-95%	96.66 83.33 85.00	5.77 20.81 17.32	P=0.381 Non significant
TOTAL	10	60-99%	88.00	15.49	



Graph (17): Correlation between mean CD4 +ve cells/ all lymphocytes in hepatic lobules and grade of recurrent hepatitis in donors

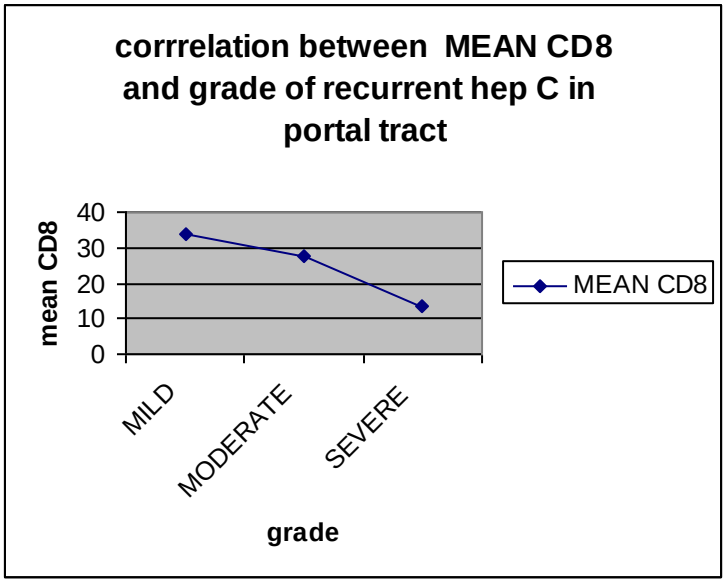
Correlation between mean ratio of CD8 +ve cells/ all lymphocytes in *portal tracts* and grade of recurrent hepatitis C in recipiens:

In mild cases the ratio of CD8+ cells to all lymphocytes was ranged from 18 to 60% with mean of 33.8%±22.82. In moderate cases the ratio of CD8+ cells to all lymphocytes was ranged from 22 to 32% with mean of 27.8%±5.20 and in severe cases the ratio of CD8+ cells to all lymphocytes was ranged from 9 to 20% with mean of 13.7%±5.18

There was NO statistically significant correlation between mean CD8 in portal tracts and grade of recurrent hepatitis (p value=0.061). This is illustrated in table (32) & graph (18):

Table (32): Correlation between mean CD8 +ve cells/ all lymphocytes in portal tracts and grade of recurrent hepatitis in recipients

grade	NO.	range	mean	±sd	P value
Mild Moderate severe	3 3 4	18-60% 22-32% 9-20%	33.83 27.83 13.75	22.82 5.20 5.18	P=0.061 Non significant
TOTAL	10	9-60%	24.00	14.64	



Graph (18): Correlation between mean CD8 +ve cells and grade of recurrent hepatitis of portal tract in recipients.

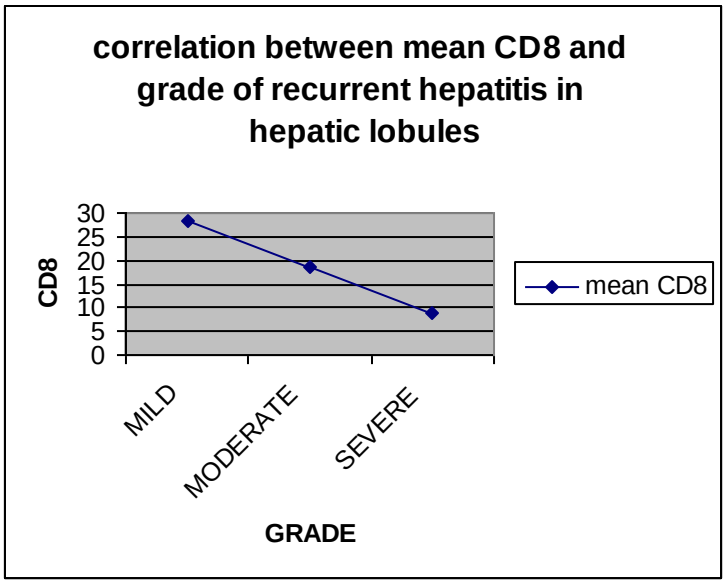
Correlation between mean ratio of CD8 +ve cells/ all lymphocytes in *hepatic lobules* and grade of hepatitis C in recipients:

In mild cases the ratio of CD8+ cells to all lymphocytes was ranged from 12 to 53% with mean of 28.3%±21.73. In moderate cases the ratio of CD8+ cells to all lymphocytes was ranged from 0 to 35% with mean of 18.8%±17.64 and in severe cases the ratio of CD8+ cells to all lymphocytes was ranged from 5 to 18% with mean of 9%±9.21

There was NO statistically significant correlation between mean CD8 in portal tracts and grade of recurrent hepatitis (p value=0.131). This is illustrated in table (33) & graph (19):

Table (33): Correlation between mean CD8 +ve cells/ all lymphocytes in hepatic lobules and grade of recurrent hepatitis in recipients

grade	NO.	range	mean	±sd	P value
Mild Moderate severe	3 3 4	12-53% 0-35% 5-18%	28.33 18.80 9.00	21.73 17.64 9.21	P=0.131 Non significant
TOTAL	10	0-53%	17.7400	16.5559	



Graph (19): Correlation between mean CD8 +ve cells/ all lymphocytes of hepatic lobules and grade of recurrent hepatitis in recipients

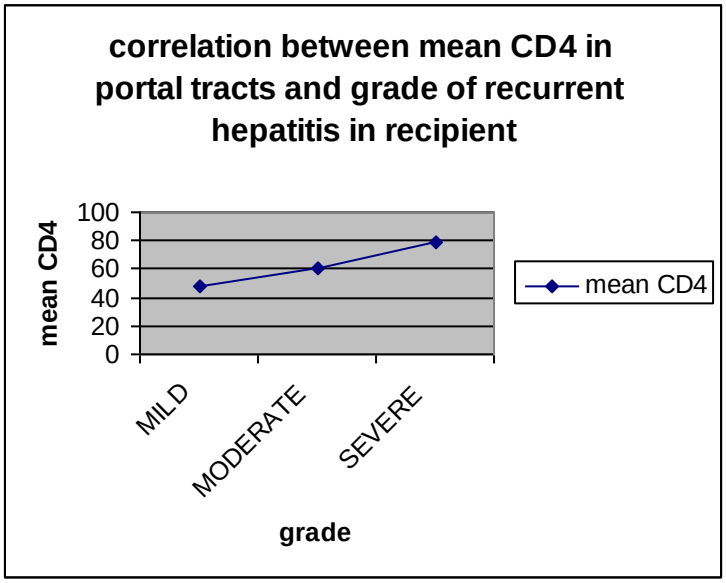
Correlation between mean ratio of CD4 +ve cells/ all lymphocytes in *portal tracts* and grade of recurrent hepatitis C in recipients:

There was increase of the ratio of CD4+ to all lymphocytes in portal tracts with the increase in grade of recurrent hepatitis C as in mild cases the ratio of CD4+ cells to all lymphocytes was ranged from 40 to 52% with mean of 47.8%±6.82. In moderate cases the ratio of CD4+ cells to all lymphocytes was ranged from 59 to 62% with mean of 60.1%±1.60 and in severe cases the ratio of CD4+ cells to all lymphocytes was ranged from 74 to 85% with mean of 78.45%±5.04

There was a significant positive correlation between mean CD4 in portal tracts and grade of recurrent hepatitis (p value=0.01). This is illustrated in table (34) & graph (20):

Table 34: Correlation between mean CD4+ve cells/ all lymphocytes in portal tracts and grade of recurrent hepatitis in recipients

grade	NO.	range	mean	±sd	P value
Mild Moderate severe	3 3 4	40-52% 59-62% 74-85%	47.83 60.16 78.45	6.82 1.60 5.04	P=0.01 Highly significant positive correlation
TOTAL	10	40-85%	63.78	14.28	



Graph (20): Correlation between mean CD4+ve cells/ all lymphocytes in portal tracts and grade of recurrent hepatitis in recipients

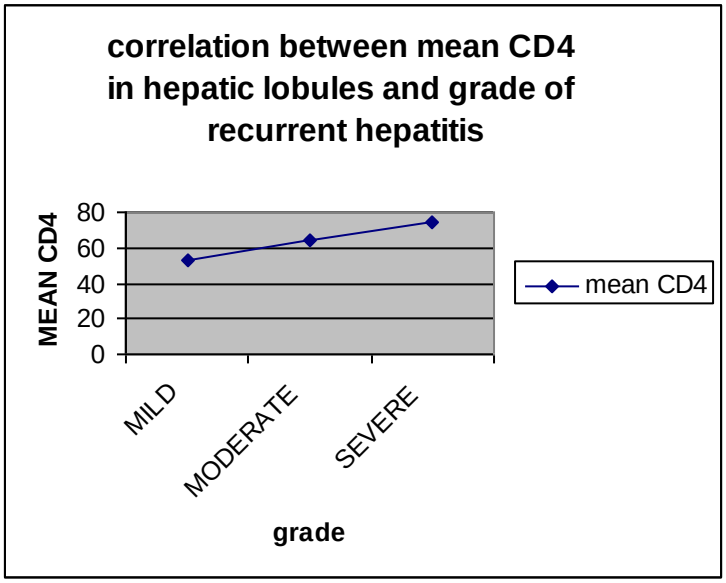
Correlation between mean ratio of CD4 +ve cells/ all lymphocytes in *hepatic lobules* and grade of recurrent hepatitis C in recipient cases:

There was increase of the ratio of CD4+ to all lymphocytes in hepatic lobules with the increase in grade of recurrent hepatitis C as iin mild cases the ratio of CD4+ cells to all lymphocytes was ranged from 45 to 59% with mean of 53%±7.21. In moderate cases the ratio of CD4+ cells to all lymphocytes was ranged from 60 to 66% with mean of 63.68%±3.12 and in severe cases the ratio of CD4+ cells to all lymphocytes was ranged from 73 to 74% with mean of 73.8%±0.62

There was a significant positive correlation between mean CD4 in hepatic lobules and grade of recurrent hepatitis (p value=0.01). This is illustrated in table (35) & graph (21):

Table (35): Correlation between mean CD4 +ve cells/ all lymphocytes in hepatic lobules and grade of recurrent hepatitis in recipients

grade	NO.	range	mean	±sd	P value
Mild Moderate severe	3 3 4	45-59% 60-66 % 73-74%	53.00 63.68 73.82	7.21 3.12 .62	P=0.01 Highly significant positive correlation
TOTAL	10	45-74%	64.53	9.83	



Graph (21): Correlation between mean CD4 +ve cells/ all lymphocytes in hepatic lobules and grade of recurrent hepatitis in recipients

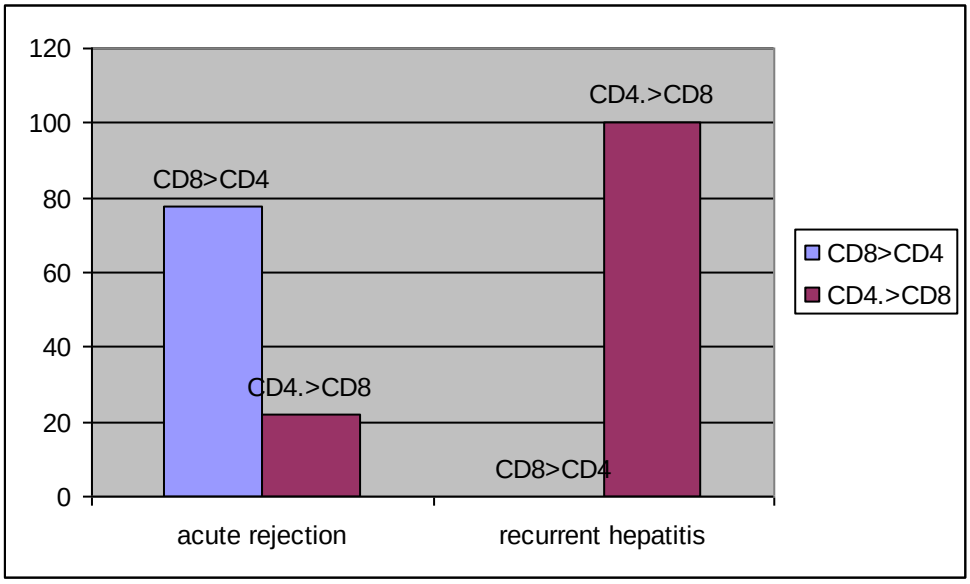
Ratio between CD4 and CD8 in donors

In acute rejection cases, 7out of 9 cases (77.7%) showed CD8>CD4 in both portal tracts and hepatic lobules; while 2 cases (22.3%) showed CD4>CD8 while, in recurrent hepatitis cases, all the 10 cases (100%) showed CD4>CD8

Results are illustrated in table (36) and graph (22):

Table (36): Ratio between CD4 and CD8 in pre transplant cases (donors)

Ratio between CD4 and CD8	ACUTE REJECTION (No. of cases)	RECURRENT HEPATITIS C(No. of cases)
CD8>CD4	7(77.7%)	0(0%)
CD4>CD8	2(22.3%)	10(100%)
Total	**9**	**10**



Graph (22): Ratio between CD4 and CD8 in donors

Ratio between CD4 and CD8 in recipients

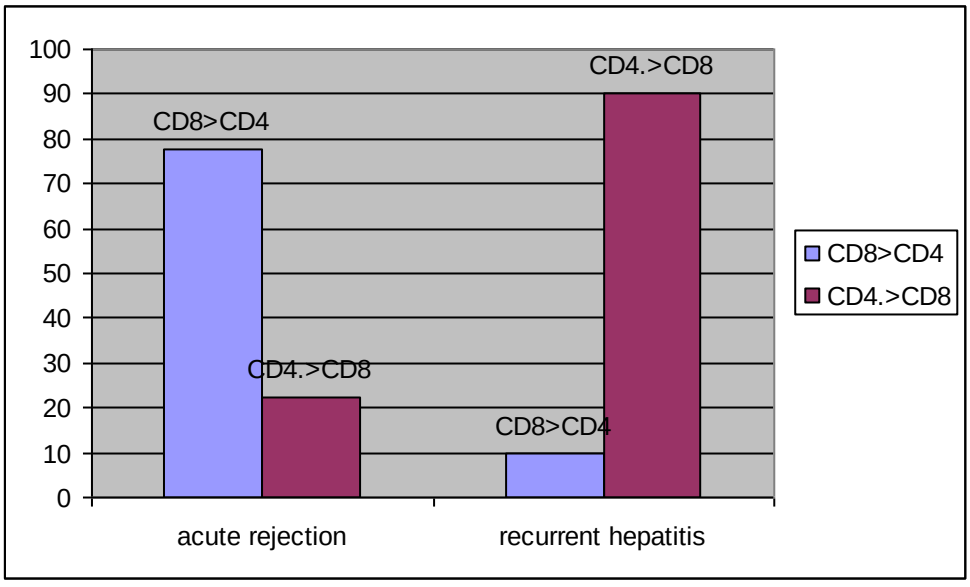
In acute rejection cases, 7 out of 9 cases (77.7%) showed CD8>CD4 in both portal tracts and hepatic lobules, while 2 cases (22.3%) showed CD4>CD8.

In recurrent hepatitis cases, 1out of 10 cases (10%) showed CD8>CD4 while 9 cases (90%) showed CD4>CD

Results are illustrated in table (37) and graph (23):

Table (37): Ratio between CD4 and CD8 in post transplant cases

Ratio between CD4 and CD8	ACUTE REJECTION (No. of cases)	RECURRENT HEPATITIS C(N0. Of cases)
CD8>CD4	7(77.7%)	1(10%)
CD4>CD8	2(22.3%)	9(90%)
Total	**9**	**10**



Graph (23): Ratio between CD4 and CD8 in recipients

Table (38): Correlation between studied cases and (MEAN CD4 &CD8)

Cases		*Mean CD8*	*P value*	*Mean CD4*	*P value*
ACR					
Donors					
Portal tracts	Mild	37.05	**P=0.01(highly significant positive correlation)**	59.67	**P=0.05(significant inverse correlation)**
	moderate	66.62		29.66	
Hepatic lobules	Mild	35.27	**P=0.430 (non significant)**	18.00	**P=0.273 (non significant)**
	Moderate	59.24		28.98	
Recipients					
Portal tracts	Mild	54.75	**P=0.01(highly significant positive correlation)**	44.75	**P=0.01(highly significant inverse correlation)**
	Moderate	63.80		36.00	
Hepatic lobules	Mild	26.75	**P=0.074 (non significant)**	8.50	**P=0.624 (non significant)**
	Moderate	57.90		35.20	
Rec.hep C					
Donors					
Portal tracts	Mild	3.33	**P=0.685 (non significant)**	90	**P=0.706 (non significant)**
	Moderate	11.00		85	
	Severe	8.00		85	
Hepatic lobules	Mild	6.00	**P=0.444 (non significant)**	96.66	**P=0.381 (non significant**
	Moderate	13.00		83.33	
	Severe	1.25		85.00	
Recipients					
Portal tracts	Mild	33.83	**P=0.061 (non significant)**	47.83	**P=0.01(highly significant positive correlation)**
	Moderate	27.83		60.16	
	Severe	13.75		74.45	
Hepatic lobules	Mild	28.33	**P=0.131 (non significant)**	53.00	**P=0.01(highly significant positive**
	Moderate	18.80		63.68	

					correlation)
	Severe	9.00		73.82	

Figure (6): A liver biopsy of donor show minimal steatosis (<5%)(arrow)& minimal portal inflammation (double arrow) (H&E x200)

Figure (7): A liver biopsy from donor show focus of spotty necrosis (arrow) (H&E x200)

Figure (8): A post transplant biopsy from recipient; moderate ACR of score 4/9 show endotheliitis (arrow), bile duct changes (double arrow) and portal inflammation (H&Ex200)

Figure (9): A post transplant biopsy from recipient; recurrent hepatitis of severe activity of Ishak score 15/18 show interface hepatitis, portal inflammation, confluent necrosis (arrow) and spotty necrosis (double arrow) (H&E x200)

Figure (10): A post transplant biopsy from recipient; recurrent hepatitis of moderate activity of Ishak score 11/18 show interface hepatitis, portal inflammation and spotty necrosis (H&E x200)

Figure (11): A post transplant biopsy from recipient; recurrent hepatitis, mild activity of Ishak score 6/18 show mild portal inflammatino, spotty necrosis and mild interface hepatitis (H&Ex100)

Figure (12): Anti- CD8 immunostain in a donor of a case of ACR show CD8+ cells in portal tract (arrow)(strept- Avidin Biotin, DAB chromogenx400.)

Figure (13): Anti-CD4 immunostain in a donor of a case of ACR show CD4+ cells in portal tract (arrow) (strept- Avidin Biotin, DAB chromogenx400)

Figure (14): Anti- CD8 immunostain in a donor of a case of ACR show CD8+ cells in hepatic lobule(strept -Avidin Biotin ,DAB chromogenx400)

Figure (15): Anti- CD4 immunostain in a donor of a case of ACR show CD4+ cells in hepatic lobule (strept- Avidin Biotin ,DAB chromogenx400)

Figure (16): Anti- CD8 immunostain in a recipient case of ACR show CD8+ cells portal tract(strept- Avidin Biotin ,DAB chromogenx200)

Figure (17): Anti-CD4 immunostain in a recipient case of ACR show CD4+ cells in portal tract (strept- Avidin Biotin, DAB chromogenx200)

Figure (18): Anti CD8 immunostain in a recipient case of ACR show CD8+ cells in hepatic lobule (strept- Avidin Biotin, DAB chromogenx400)

Figure (19): Anti- CD4 immunostain in a recipient case of ACR show CD4+ cells in hepatic lobules (strept- Avidin Botin, DAB chromagenx400)

Figure (20): Anti- CD8 immunostain in a donor of a case of recurrent hepatitis CD8 + cells in portal tract(strept- Avidin Biotin, DAB chromogenx400)

Figure (21): Anti-CD4 immunostain in a donor case of recurrent hepatitis show CD4+ cells in portal tract (strept- Avidin Biotin, DAB chromogenx400)

Figure (23): Anti-CD8 immunostain in a donor case of recurrent hepatitis show CD8 negative cells in hepatic lobule (strept- Avidin Biotin, DAB chromogenx400)

Figure (23): Anti-CD4 immunostain in a donor of a case of recurrent hepatitis show CD4+ cells in hepatic lobule (strept- Avidin Biotin, DAB chromogenx400)

Figure (24): Anti- CD8 immunostain in a recipient case of recurrent hepatitis show CD8+ cells in portal tract (strept- Avidin Biotin, DAB chromogenCD8x200)

Figure (25): Anti- CD4 immunostain in a recipient case of recurrent hepatitis show CD4+ cells in portal tract(strept- Avidin Biotin, DAB chromogenx200)

Figure (26): Anti- CD8 immunostain in a recipient case of recurrent hepatitis show CD8+ cells in hepatic lobule(strept- Avidin Biotin, DAB chromogenx400)

Figure (27): Anti-CD4 immunostain in a recipient case of recurrent hepatitis show CD4+ cells in hepatic lobule (strept- Avidin Botin, DAB chromagenx400)