Results

Effect of acute cold stress on corticosterone , blood glucose and lipid profile levels in rats in comparison with control group.

As shown in table(1a- 1b) and chart (1a- 1b):
Acute cold stress lasted 1.5 h at a temperature + 2-4^{o}C leads to :

Significant increase in corticosterone level in serum from 11.8 ± 1.22 in control group to 16.9 ± 1.93 in cold stress group ($p<0.0001$). Significant increase in blood glucose level from 88.2 ± 7.78 in control group to 139± 8.89 in cold stress group ($P<0.0001$). Significant increase in triglyceride level from 103.33 ±17.07 in control group to 162.67 ± 11.71 in cold stress group ($p<0.0001$). Significant increase in total cholesterol level from 72.67 ± 9.75 in control group to 97.67 ± 5.85 in cold stress group ($p<0.0001$). Non-significant increase in HDL from 34 ± 8.17 to 35.8 ± 6.49. Significant increase in LDL from 18 ± 9.97 to 29.3 ±2.7 in cold stress group ($p<0.04$).

Table (1-a)

Effect of acute cold stress on corticosterone and blood glucose levels in rats comparison with control group.

n	Corticosterone ug/dl		glucose mg/dl	
	Control	Cold stress	Control	Cold stress
1	12.8	13.6	97	132
2	12.2	15.9	86	149
3	11.3	17.5	77	140
4	13.5	18.8	93	134
5	10.4	16.6	82	129
6	10.7	18.7	94	150
Mean	11.8	*16.9	88.2	*139
SD	1.22	1.93	7.78	8.89
SE	0.4989	0.7860	3.18	3.63
T	5.424		10.64	
P	<0.0001		<0.0001	

n: number of rats.
SD:standard deviation
SE : standard error
T: student test
P: values as compared with the control.
*Significant change in comparison to the corresponding group.

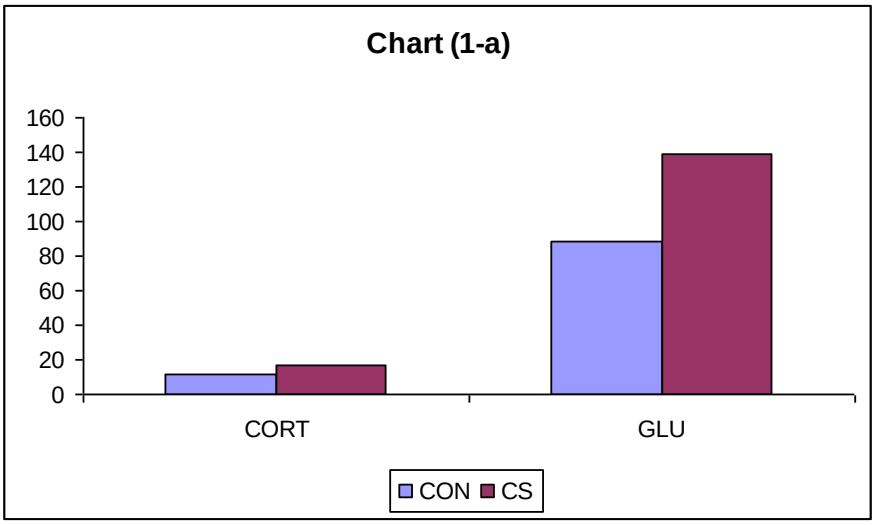
Table (1-b)

Effect of acute cold stress on lipid profile in rats comparison with control group.

n	Triglyceride mg/dl		Cholesterol mg/dl		HDL mg/dl		LDL mg/dl	
	Control	Cold stress	Control	Cold stress	Control	Cold stress	Control	Cold stress
1	124	143	80	94	41	38	14.2	27.4
2	107	165	72	101	33	42	17.6	26
3	112	177	58	96	24	33	11.6	27.6
4	99	164	65	94	28	29	17.2	32.2
5	73	170	84	93	32	29	37.4	30
6	105	157	77	108	46	44	10	32.6
Mean	103.33	*162.67	72.67	*97.67	34.00	35.8	18.00	*29.3
SD	17.07	11.71	9.75	5.85	8.17	6.49	9.97	2.7
SE	6.969	4.779	3.981	2.376	3.337	2.65	4.068	1.113
T	7.021		5.393		0.782		2.701	
P	<0.0001		<0.0001		Non - significant		<0.04	

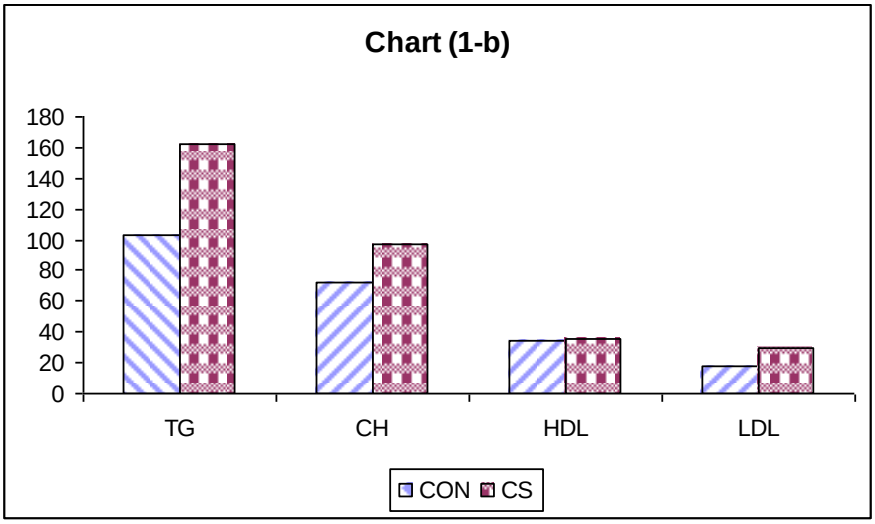
*Significant change in comparison to the corresponding group.
T: values as compared with the control.
P: values as compared with the control

Effect of acute cold stress on corticosterone and blood glucose levels in rats comparison with control group.



CON:control
CS:cold stress
CORT:corticosterone
GLU:glucose

Effect of acute cold stress on lipid profile in rats comparison with control group.



TG:triglyceride
CH:cholester

Effect of acute immobilization stress on corticosterone , blood glucose and lipid profile levels in rats in comparison with control group.

As shown in table(2a-2b) and chart (2a-2b):
acute immobilization stress for 2 hours leads to :

Significant increase in corticosterone level in blood from 11.8 ± 1.22 in control group to 19.1 ± 1.95 in acute immobilization stress group ($p<0.0001$). Significant increase in blood glucose level from 88.2 ± 7.78 in control group to 136.2 ± 12.12 in acute immobilization stress group ($P<0.001$). Significant increase in triglyceride level from 103.3 ±17.07 in control group to 166 ± 14.18 in acute immobilization stress group ($p<0.0001$). Significant increase in total cholesterol level from 72.67 ± 9.75 in control group to 98.8 ± 5.56 in acute immobilization stress group ($p<0.0001$). Non- significant increase in HDL from 34 ± 8.17 in control group to 36.8 ± 7.08 in acute immobilization stress group . Significant increase in LDL from 18 ± 9.96 in control group to 28.8 ±10.11 in acute immobilization stress group ($p<0.05$).

Table (2-a)

Effect of acute immobilization stress on corticosterone and blood glucose levels in rats in comparison with control group.

n	Corticosterone ug/dl		glucose mg/dl	
	Control	Acute imm.stress	Control	Acute imm.stress
1	12.8	18.8	97	121
2	12.2	19.4	86	122
3	11.3	22.3	77	140
4	13.5	16.2	93	138
5	10.4	18.8	82	150
6	10.7	19.3	94	146
Mean	11.8	*19.1	88.2	*136.2
SD	1.22	1.95	7.78	12.12
SE	0.499	0.795	3.18	4.96
T	7.796		7.10	
P	<0.0001		<0.001	

*Significant change in comparison to the corresponding group.
T: values as compared with the control.
P: values as compared with the control.

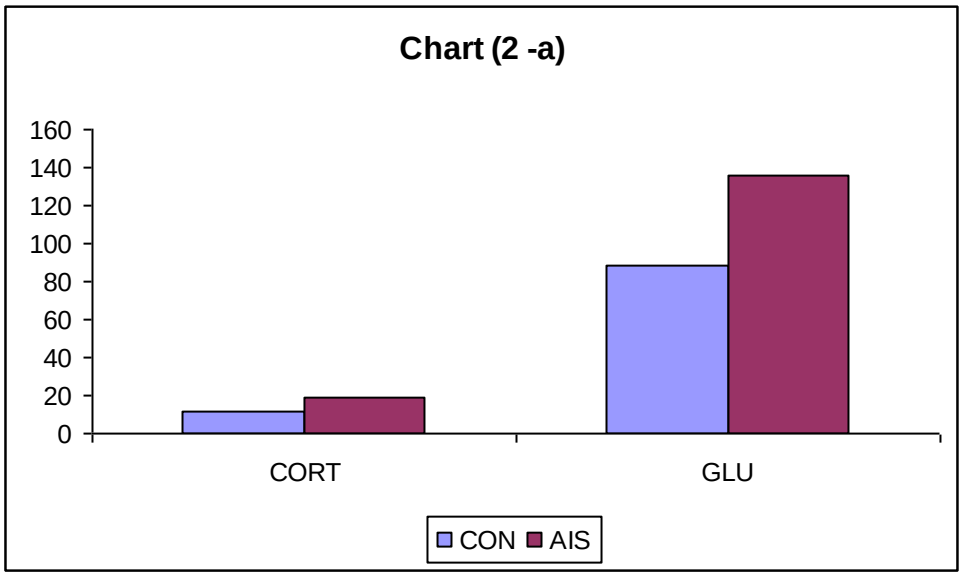
Table (2-b)

Effect of acute immobilization stress on lipid profile in rats in comparison with control group.

n	Triglyceride mg/dl		Cholesterol mg/dl		HDL mg/dl		LDL mg/dl	
	Control	Acute imm. stress	Control	Acute imm. stress	Control	Acute imm. stress	Control	Acute imm. stress
1	124	168	80	100	41	44	14.2	22.4
2	107	145	72	90	33	40	17.6	21
3	112	172	58	107	24	33	11.6	39.6
4	99	153	65	101	28	30	17.2	40.4
5	73	182	84	98	32	29	37.4	32.6
6	105	176	77	97	46	45	10	16.8
Mean	103.3	*166	72.67	*98.8	34.00	36.8	18.0	*28.8
SD	17.07	14.18	9.75	5.56	8.17	7.08	9.97	10.11
SE	6.97	5.79	3.981	2.27	3.337	2.892	4.068	4.13
T	6.916		5.709		1.516		2.131	
P	<0.0001		<0.0001		Non - significant		<0.05	

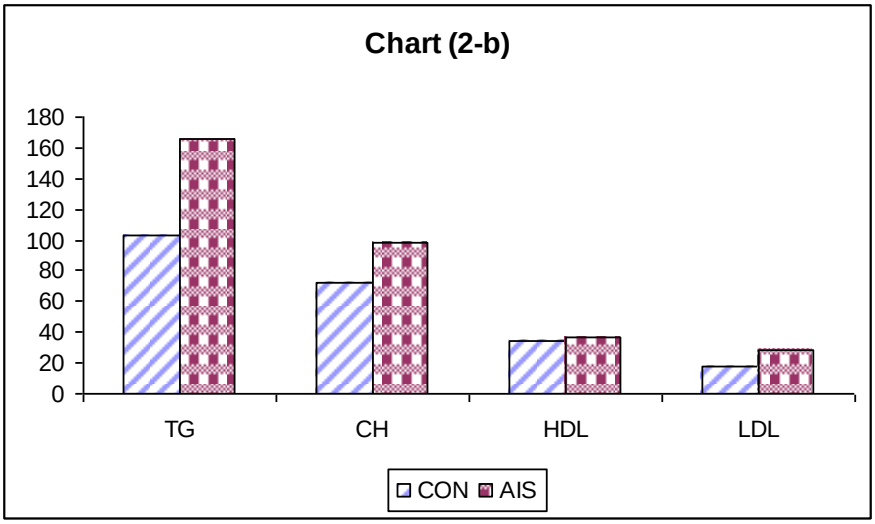
*Significant change in comparison to the corresponding group.
T: values as compared with the control.
P: values as compared with the control

Effect of acute immobilization stress on corticosterone and blood glucose levels in rats in comparison with control group.



CON:control
AIS:acute immobilization stress
CORT:corticosterone
GLU:glucose

Effect of acute immobilization stress on lipid profile in rats in comparison with control group.



TG:triglyceride
CH:cholesterol

Effect of chronic immobilization stress on corticosterone , blood glucose and lipid profile levels in rats in comparison with control group.

As shown in table(3a-3b) and chart (3a-3b):
acute immobilization stress for 1h/day for 9 days leads to :

Significant increase in corticosterone level in blood from 11.8 ± 1.22 in control group to 17.8 ± 3.25 in chronic immobilization stress ($p<0.002$). Significant increase in blood glucose level from 88.2 ± 7.8 in control group to 202.33± 16.19 in chronic immobilization stress ($P<0.001$). Significant increase in triglyceride level from 103.3 ±17.07 in control group to 140 ± 9.12 in chronic immobilization stress ($p<0.001$). Significant increase in total cholesterol level from 72.67 ± 9.75 in control group to 94.8 ± 6.79 in chronic immobilization stress ($p<0.001$). Non – significant increase in HDL from 34 ± 8.17 in control group to 35.5 ± 6.09 in chronic immobilization stress . Significant increase in LDL from 18 ± 9.96 in control group to 31.3 ±4.94 in chronic immobilization stress ($p<0.02$).

Table (3-a)

Effect of chronic immobilization stress on corticosterone and blood glucose levels in rats in comparison with control group.

n	Corticosterone ug/dl		glucose mg/dl	
	Control	Chronic imm. stress	Control	Chronic imm. stress
1	12.8	16.2	97	227
2	12.2	14.0	86	216
3	11.3	22.1	77	187
4	13.5	16.9	93	191
5	10.4	15.9	82	203
6	10.7	21.4	94	190
Mean	11.8	*17.8	88.2	*202.33
SD	1.22	3.25	7.78	16.19
SE	0.499	1.33	3.18	6.61
T	4.184		18.39	
P	<0.002		<0.0001	

*Significant change in comparison to the corresponding group.
T: values as compared with the control.
P: values as compared with the control

Table (3-b)

Effect of chronic immobilization stress on lipid profile in rats in comparison with control group.

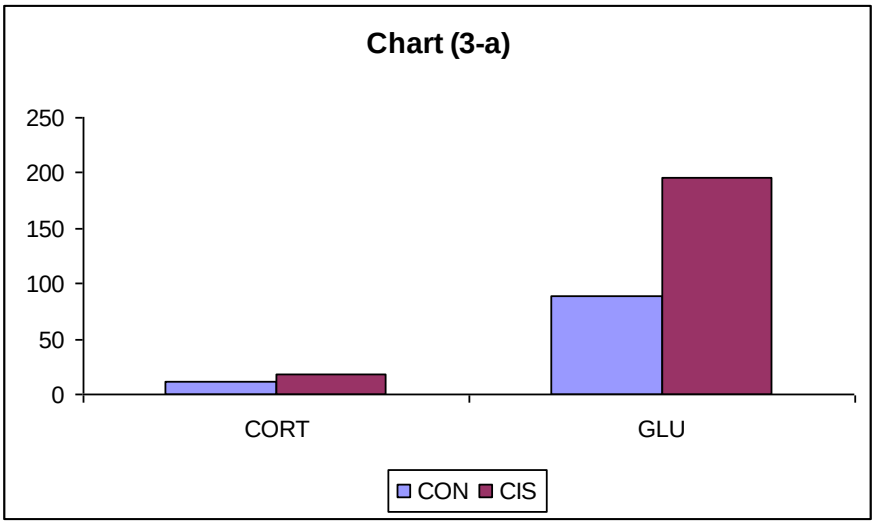
n	Triglyceride mg/dl		Cholesterol mg/dl		HDL mg/dl		LDL mg/dl	
	Control	chronic imm. stress	Control	chronic imm. stress	Control	chronic imm. stress	Control	chronic imm. stress
1	124	139	80	95	41	43	14.2	24.2
2	107	128	72	90	33	32	17.6	32.4
3	112	145	58	95	24	29	11.6	37
4	99	141	65	85	28	30	17.2	26.8
5	73	133	84	104	32	42	37.4	35.4
6	105	154	77	100	46	37	10	32.2
Mean	103.3	*140	72.67	*94.8	34.00	35.5	18.0	*31.3
SD	17.07	9.12	9.75	6.79	8.17	6.09	9.97	4.94
SE	6.97	3.72	3.981	2.78	3.337	2.487	4.068	2.016
T	4.640		4.569		0.579		3.311	
P	<0.001		<0.001		Non - significant		<0.02	

*Significant change in comparison to the corresponding group.

T: values as compared with the control.

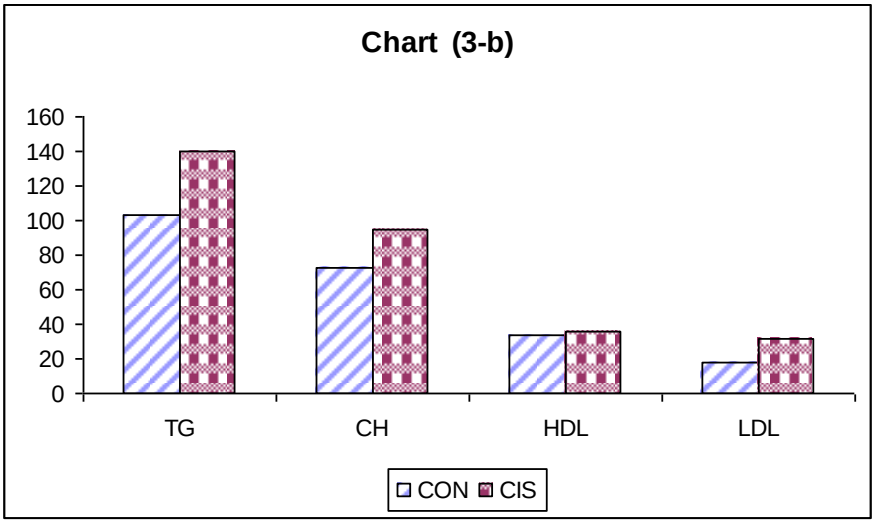
P: values as compared with the control

Effect of chronic immobilization stress on corticosterone and blood glucose levels in rats in comparison with control group.



CON:control
CIS:chronic immobilization stress
CORT:corticosterone
GLU:glucose

Effect of chronic immobilization stress on lipid profile in rats in comparison with control group.



TG:triglyceride
CH:cholesterol

Effect of L-arginine on corticosterone and blood glucose and lipid profile levels in rats under the effect of acute cold stress in comparison with the control group.

As shown in table(4a-4b) and chart (4a-4b):
200 mg/kg of L-Arginine singl oral dose befor acute cold stress leads to:

Non- significant effect on corticosterone level in blood from 11.8 ± 1.22 in control group to 11.5 ± 1.55 in group exposed to cold stress. Significant increase in blood glucose level from 88.2 ± 7.78 in control group to 128.8± 14.11 in group exposed to cold stress (P<0.002). Non- significant increase in triglyceride level from 103.3 ±17.07 in control group to 105 ± 10.81 in group exposed to cold stress. Significant increase in total cholesterol level from 72.67 ± 9.75 in control group to 82.67 ± 5.89 in group exposed to cold stress (p<0.05). Non- significant increase in HDL from 34 ± 8.17 in control group to 38.5 ± 5.5 in group exposed to cold stress. Non – significant increase in LDL from 18 ± 9.97 in control group to 21.8 ± 6.55 in group exposed to cold stress.

Table (4-a)

Effect of L-arginine on corticosterone and blood glucose levels in rats under the effect of acute cold stress in comparison with the control group.

n	Corticosterone ug/dl		glucose mg/dl	
	Control	L-arginine + Cold st..	Control	L-arginine + Cold st.
1	12.8	11.3	97	143
2	12.2	12.5	86	142
3	11.3	9.1	77	131
4	13.5	10.2	93	105
5	10.4	13.1	82	130
6	10.7	12.5	94	122
Mean	11.8	11.5	88.2	*128.8
SD	1.22	1.55	7.78	14.11
SE	0.499	0.63	3.18	5.759
T	0.455		5.79	
P	Non - significant		<0.002	

*Significant change in comparison to the corresponding group.
T: values as compared with the control.
P: values as compared with the control

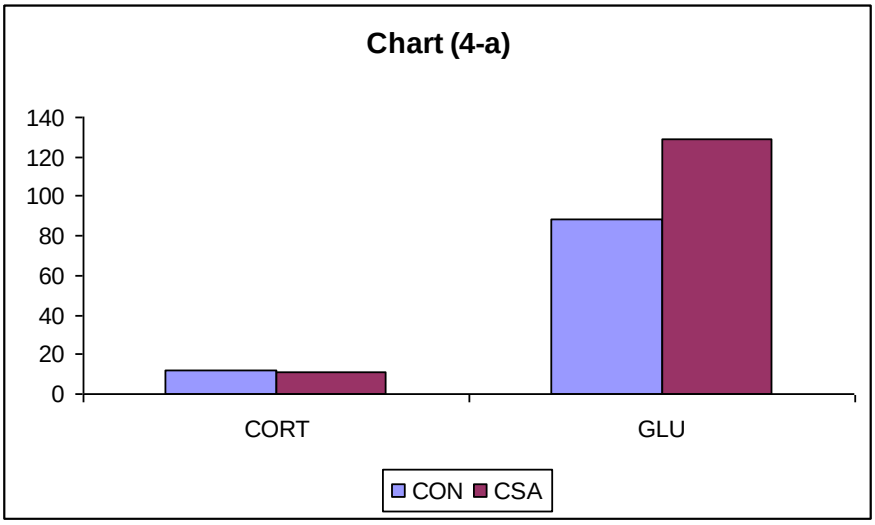
Table (4-b)

Effect of L-arginine on lipid profile in rats under the effect of acute cold stress in comparison with the control group.

n	Triglyceride mg/dl		Cholesterol mg/dl		HDL mg/dl		LDL mg/dl	
	Control	L-arginine + Cold st.	Control	L-arginine + Cold st.	Control	L-arginine + Cold st.	Control	L-arginine + Cold st.
1	124	102	80	79	41	44	14.2	19
2	107	111	72	81	33	30	17.6	28.8
3	112	90	58	85	24	36	11.6	20.2
4	99	98	65	93	28	38	17.2	22.6
5	73	108	84	76	32	38	37.4	11.4
6	105	121	77	82	46	45	10	28.6
Mean	103.3	105	72.667	*82.67	34.00	38.5	18.0	21.8
SD	17.07	10.81	9.75	5.89	8.17	5.5	9.97	6.55
SE	6.97	4.41	3.981	2.404	3.337	2.25	4.068	2.674
T	0.202		2.151		1.85		0.598	
P	Non - significant		<0.05		Non - significant		Non - significant	

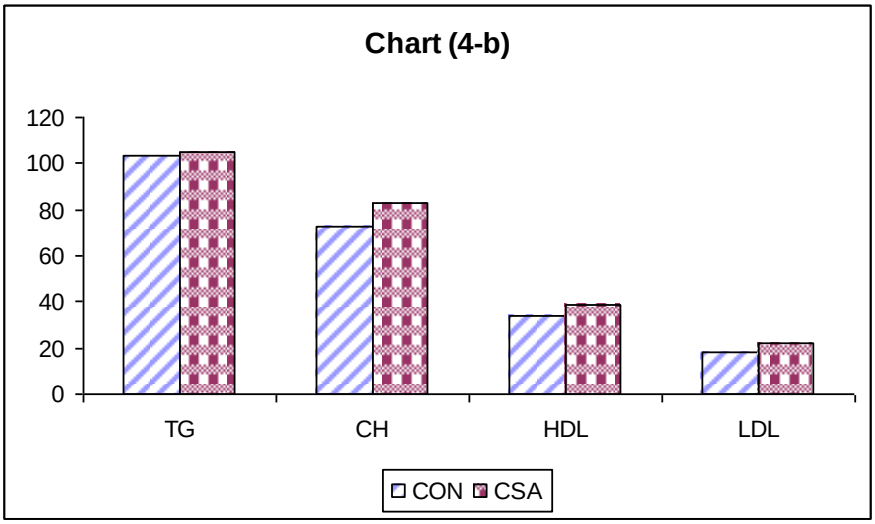
*Significant change in comparison to the corresponding group.
T: values as compared with the control.
P: values as compared with the control

Effect of L-arginine on corticosterone and blood glucose levels in rats under the effect of acute cold stress in comparison with the control group.



CON:control
CSA:cold stress+L-arginine
CORT:corticosterone
GLU:glucose

Effect of L-arginine on lipid profile in rats under the effect of acute cold stress in comparison with the control group.



TG:triglyceride
CH:cholesterol

Effect of L-arginine on corticosterone , blood glucose and lipid profile levels in rats under the effect of acute immobilization stress in comparison with control group.

As shown in table(5a-5b) and chart (5a-5b):

200 mg/kg of L-Arginine single oral dose befor acute immobilization stress leads to :

Significant increase in corticosterone level in blood from 11.8 ± 1.22 in control group to 15 ± 1.78 in group exposed to acute immobilization stress (P<0.004). Significant increase in blood glucose level from 88.2 ± 7.8 in control group to 133± 5.59 in group exposed to acute immobilization stress (P<0.0001). Non- significant increase in triglyceride level from 103.3 ±17.07 in control group to 105.2 ± 10.3 in group exposed to acute immobilization stress. Non-Significant increase in total cholesterol level from 72.67 ± 9.75 in control group to 83.5 ± 8.01 in group exposed to acute immobilization stress. Non- significant increase in HDL from 34 ± 8.17 in control group to 36.3 ± 5.92 in group exposed to acute immobilization stress. Non – significant increase in LDL from 18 ± 9.97 in control group to 26.1±7.61 in group exposed to acute immobilization stress.

Table (5-a)

Effect of L-arginine on corticosterone and blood glucose levels in rats under the effect of acute immobilization stress in comparison with control group.

n	Corticosterone ug/dl		glucose mg/dl	
	Control	L-arginine + Ac. Imm. st.	Control	L-arginine + Ac. Imm. st.
1	12.8	17.6	97	140
2	12.2	16.0	86	138
3	11.3	12.2	77	132
4	13.5	15.2	93	134
5	10.4	14.9	82	129
6	10.7	14.6	94	125
Mean	11.8	*15	88.2	*133
SD	1.22	1.78	7.78	5.59
SE	0.499	0.725	3.18	2.28
T	3.712		12.79	
P	<0.004		<0.0001	

*Significant change in comparison to the corresponding group

P: values as compared with the control. T: values as compared with the control.

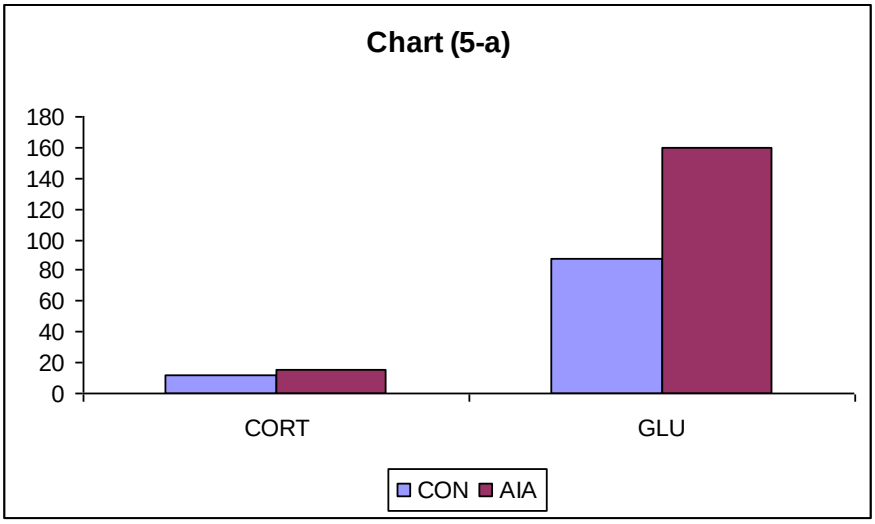
Table (5-b)

Effect of L-arginine on lipid profile in rats under the effect of acute immobilization stress in comparison with control group.

n	Triglyceride mg/dl		Cholesterol mg/dl		HDL mg/dl		LDL mg/dl	
	Control	L-arginine + Ac. Imm. st.	Control	L-arginine + Ac. Imm. st.	Control	L-arginine + Ac. Imm. st..	Control	L-arginine + Ac. Imm. st.
1	124	112	80	85	41	44	14.2	18.6
2	107	96	72	74	33	29	17.6	25.8
3	112	100	58	80	24	31	11.6	29
4	99	99	65	95	28	37	17.2	38.2
5	73	101	84	90	32	42	37.4	27.8
6	105	123	77	77	46	35	10	17.4
Mean	103.3	105.2	72.67	83.5	34.00	36.3	18.0	26.1
SD	17.07	10.30	9.750	8.02	8.17	5.92	9.97	7.61
SE	6.97	4.207	3.981	3.274	3.337	2.42	4.068	3.11
T	0.225		2.102		0.690		1.849	
P	Non - significant		Non - significant		Non - significant		Non - significant	

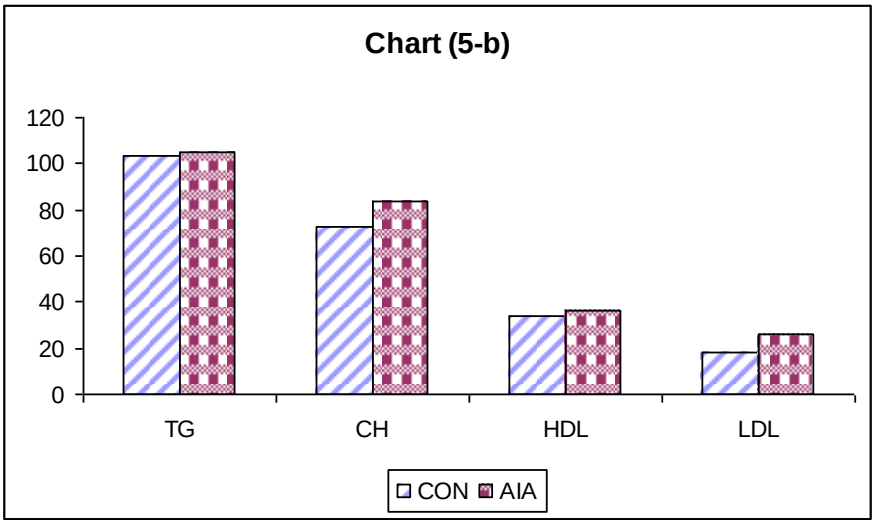
T: values as compared with the control.
P: values as compared with the control.

Effect of L-arginine on corticosterone and blood glucose levels in rats under the effect of acute immobilization stress in comparison with control group.



CON:control
AIA:acute immobilization stress+L-arginine
CORT:corticosterone
GLU:glucose

Effect of L-arginine on lipid profile in rats under the effect of acute immobilization stress in comparison with control group.



TG:triglyceride
CH:cholesterol

Effect of L-arginine on corticosterone , blood glucose and lipid profile levels in rats under the effect of chronic immobilization stress in comparison with control group.

As shown in table(6a-6b) and chart (6a-6b):

250 mg/kg of L-Arginine daily orally with chronic immobilization stress leads to:

Significant increase in corticosterone level in blood from 11.8 ± 1.2 in control group to 17.7 ± 2.67 in group exposed to chronic immobilization stress (P<0.001). Significant increase in blood glucose level from 88.2 ± 7.8 in control group to 173.8± 13.41 in group exposed to chronic immobilization stress (P<0.0001). Non-significant decrease in triglyceride level from 103.3 ±17.07 in control group to 101.2 ± 7.57 in group exposed to chronic immobilization stress. Non-Significant increase in total cholesterol level from 72.67 ±9.75 in control group to 73.3 ±9.52 in group exposed to chronic immobilization stress. Non- significant decrease in HDL from 34 ± 8.17 in control group to 33.17 ± 8.18 in group exposed to chronic immobilization stress. Non – significant increase in LDL from 18 ± 9.96 in control group to 19.9±6.39 in group exposed to chronic immobilization stress.

Table (6-a)

Effect of L-arginine on corticosterone and blood glucose levels in rats under the effect of chronic immobilization stress in comparison with control group.

n	Corticosterone ug/dl		glucose mg/dl	
	Control	L-arginine + Ch.imm st.	Control	L-arginine + Ch. Imm. st.
1	12.8	19.6	97	163
2	12.2	20.9	86	152
3	11.3	14.7	77	185
4	13.5	17.4	93	184
5	10.4	14.4	82	182
6	10.7	19.0	94	177
Mean	11.8	*17.7	88.2	173.8*
SD	1.22	2.67	7.78	13.41
SE	0.499	1.09	3.18	5.47
T	4.887		12.06	
P	<0.001		<0.0001	

*Significant change in comparison to the corresponding group

T: values as compared with the control.

P: values as compared with the control.

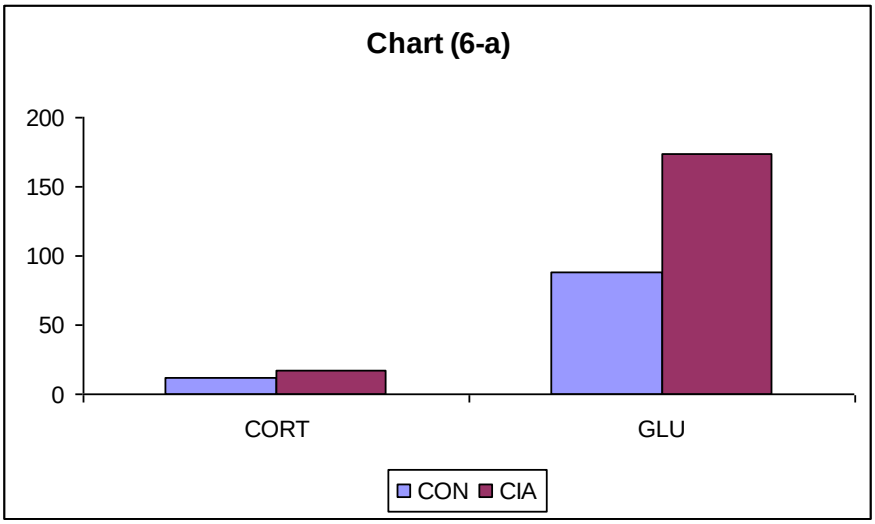
Table (6-b)

Effect of L-arginine on lipid profile in rats under the effect of chronic immobilization stress in comparison with control group.

n	Triglyceride mg/dl		Cholesterol mg/dl		HDL mg/dl		LDL mg/dl	
	Control	L-arginine + Ch.imm.st.	Control	L-arginine + Ch.imm.st.	Control	L-arginine + Ch. Imm. st.	Control	L-arginine + Ch. Imm. st.
1	124	97	80	86	41	34	14.2	32.6
2	107	107	72	77	33	38	17.6	17.6
3	112	92	58	79	24	46	11.6	14.6
4	99	98	65	60	28	23	17.2	17.4
5	73	100	84	65	32	27	37.4	18
6	105	113	77	73	46	31	10	19.4
Mean	103.3	101.2	72.67	73.3	34.00	33.2	18.0	19.9
SD	17.07	7.57	9.75	9.52	8.17	8.18	9.97	6.39
SE	6.97	3.09	3.981	3.89	3.337	3.34	4.068	2.61
T	0.284		0.120		0.159		0.377	
P	Non - significant		Non - significant		Non - significant		Non - significant	

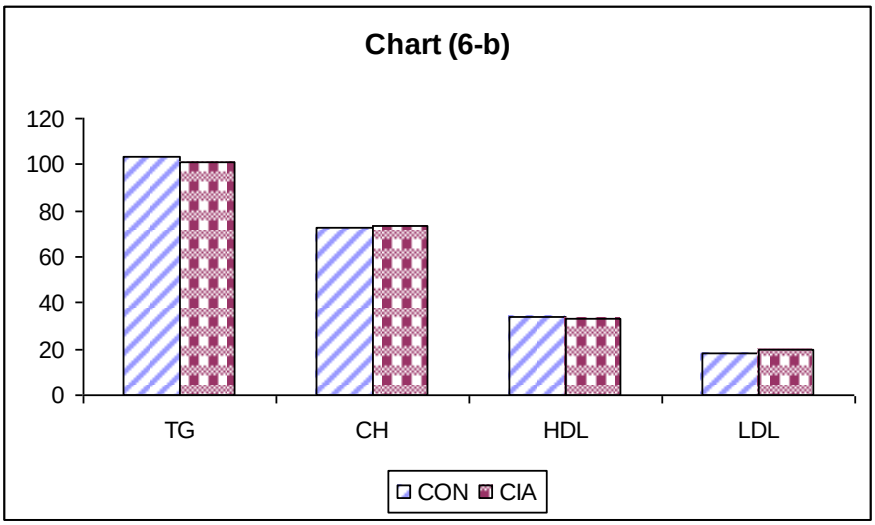
T: values as compared with the control.
P: values as compared with the control

Effect of L-arginine on corticosterone and blood glucose levels in rats under the effect of chronic immobilization stress in comparison with control group.



CON:control
CIA:chronic immobilization stress+L-arginine
CORT:corticosterone
GLU:glucose

Effect of L-arginine on lipid profile in rats under the effect of chronic immobilization stress in comparison with control group.



TG:triglyceride
CH:cholesterol

Effect of L-NAME on corticosterone , blood glucose and lipid profile levels in rats under the effect of acute cold stress in comparison with the control group.

As shown in table(7a-7b) and chart (7a-7b):
30 mg/kg of L-NAME subcutaneous dose befor acute cold stress leads to:

Significant increase in corticosterone level in blood from 11.8 ± 1.22 in control group to 19.8 ± 0.95 in group exposed to cold stress (P<0.0001). Significant increase in blood glucose level from 88.2 ± 7.8 in control group to 194.3± 5 in group exposed to cold stress (P<0.0001). Significant increase in triglyceride level from 103.3 ±17.07 in control group to 159.8 ± 8.13 in group exposed to cold stress (P<0.0001). Significant increase in total cholesterol level from 72.67 ± 9.75 in control group to 98±9.03 in group exposed to cold stress (P<0.001). Non - significant increase in HDL from 34 ± 8.17 in control group to 36.3± 7.06 in group exposed to cold stress . Significant increase in LDL from 18 ± 9.97 in control group to 29.7± 6.5 in group exposed to cold stress (P<0.01).

Table (7-a)

Effect of L-NAME on corticosterone and blood glucose levels in rats under the effect of acute cold stress in comparison with the control group.

n	Corticosterone ug/dl		glucose mg/dl	
	Control	L-NAME + Cold st..	Control	L-NAME + Cold st.
1	12.8	20.4	97	197
2	12.2	19.9	86	187
3	11.3	19.3	77	198
4	13.5	20.4	93	204
5	10.4	18.2	82	190
6	10.7	20.8	94	200
Mean	11.8	19.8*	88.2	*194.3
SD	1.22	0.952	7.78	5.0
SE	0.499	0.389	3.18	2.04
T	12.675		32.77	
P	<0.0001		<0.0001	

*Significant change in comparison to the corresponding group
T: values as compared with the control.
P: values as compared with the control

Table (7-b)

Effect of L-NAME on lipid profile in rats under the effect of acute cold stress in comparison with the control group.

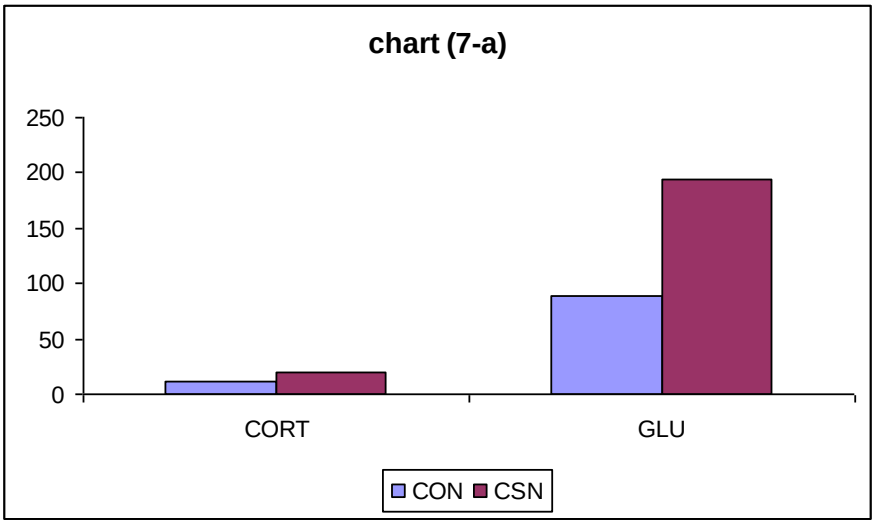
n	Triglyceride mg/dl		Cholesterol mg/dl		HDL mg/dl		LDL mg/dl	
	Control	L-NAME + Cold st.	Control	L-NAME + Cold st.	Control	L-NAME + Cold st.	Control	L-NAME + Cold st.
1	124	167	80	107	41	42	14.2	31.6
2	107	156	72	97	33	34	17.6	31.8
3	112	149	58	83	24	33	11.6	20.2
4	99	170	65	107	28	37	17.2	36
5	73	163	84	94	32	26	37.4	35.4
6	105	154	77	100	46	46	10	23.2
Mean	103.3	159.8*	72.67	*98	34.00	36.3	18.0	29.7*
SD	17.07	8.13	9.75	9.03	8.17	7.062	9.97	6.52
SE	6.97	3.321	3.981	3.688	3.337	2.883	4.068	2.663
T	7.318		4.669		1.464		3.772	
P	<0.0001		<0.001		Non - significant		<0.01	

*Significant change in comparison to the corresponding group

T: values as compared with the control.

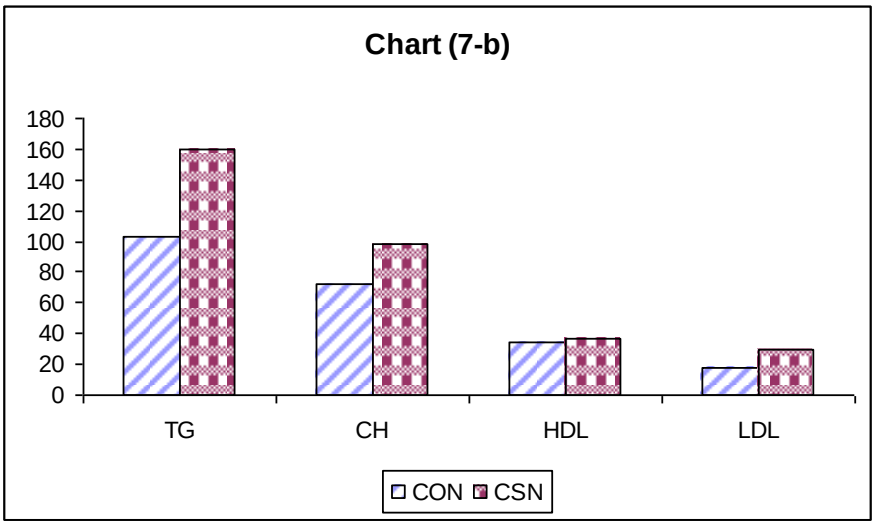
P: values as compared with the control

Effect of L-NAME on corticosterone and blood glucose levels in rats under the effect of acute cold stress in comparison with the control group.



CON:control
CSN:cold stress+L-NAME
CORT:corticosterone
GLU:glucose

Effect of L-NAME on lipid profile in rats under the effect of acute cold stress in comparison with the control group.



TG:triglyceride
CH:cholesterol

Effect of L-NAME on corticosterone , blood glucose and lipid profile levels in rats under the effect of acute immobilization stress in comparison with the control group

As shown in table(8a-8b) and chart (8a-8b):

30 mg/kg of L-NAME subcutaneous dose befor acute immobilization stress leads to:

Significant increase in corticosterone level in blood from 11.8 ± 1.22 in control group to 22.3 ± 1.6 in group exposed to acute immobilization stress (P<0.0001). Significant increase in blood glucose level from 88.2 ± 7.8 in control group to 210.8± 18.49 in group exposed to acute immobilization stress (P<0.0001). Significant increase in triglyceride level from 103.3 ±17.07 in control group to 169.3 ± 9.77 in group exposed to acute immobilization stress. Significant increase in total cholesterol level from 72.67 ± 9.75 in control group to 107.5±8.80 in group exposed to acute immobilization stress (P<0.0001). Non - significant increase in HDL from 34 ± 8.17 in control group to 35.7 ± 8.38 in group exposed to acute immobilization stress. Significant increase in LDL from 18 ± 9.97 in control group to 37.97 ±8.21 in group exposed to acute immobilization stress (P<0.007).

Table (8-a)

Effect of L-NAME on corticosterone and blood glucose levels in rats under the effect of acute immobilization stress in comparison with control group.

n	Corticosterone ug/dl		glucose mg/dl	
	Control	L-NAME + Ac. Imm. st.	Control	L-NAME + Ac. Imm. st.
1	12.8	19.6	97	195
2	12.2	22.9	86	196
3	11.3	22.4	77	232
4	13.5	24.5	93	234
5	10.4	22.6	82	213
6	10.7	21.8	94	195
Mean	11.8	22.3*	88.2	210.8*
SD	1.22	1.603	7.78	18.49
SE	0.499	0.654	3.18	7.55
T	12.742		12.96	
P	<0.0001		<0.0001	

*Significant change in comparison to the corresponding group

T: values as compared with the control.

P: values as compared with the control.

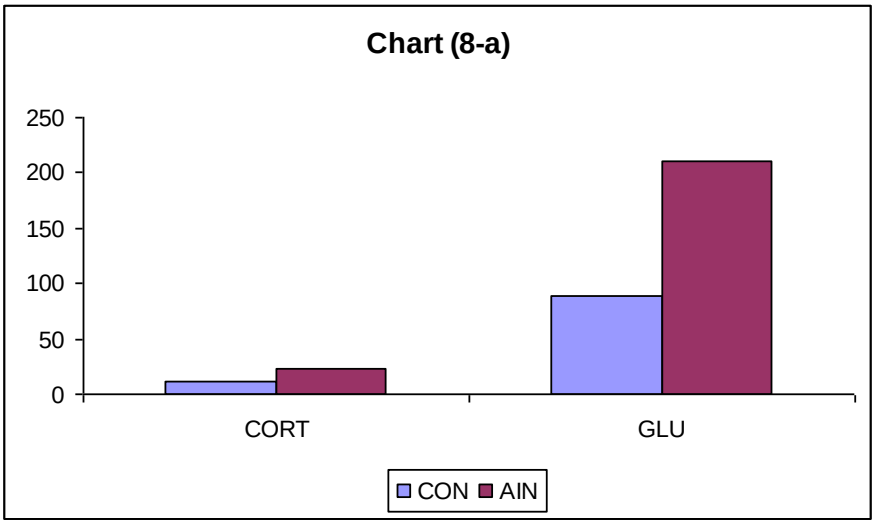
Table (8-b)

Effect of L-NAME on lipid profile in rats under the effect of acute immobilization stress in comparison with control group.

n	Triglyceride mg/dl		Cholesterol mg/dl		HDL mg/dl		LDL mg/dl	
	Control	L-NAME + Ac. Imm. st.	Control	L-NAME + Ac. Imm. st.	Control	L-NAME + Ac. Imm. st..	Control	L-NAME + Ac. Imm. st.
1	124	169	80	122	41	47	14.2	41.2
2	107	182	72	104	33	39	17.6	28.6
3	112	156	58	114	24	35	11.6	47.8
4	99	167	65	104	28	30	17.2	40.6
5	73	163	84	98	32	23	37.4	42.4
6	105	179	77	103	46	40	10	27.2
Mean	103.3	169.3*	72.67	*107.5	34.00	35.7	18.0	*37.97
SD	17.07	9.77	9.75	8.80	8.173	8.38	9.97	8.21
SE	6.97	3.989	3.981	3.954	3.337	3.42	4.068	3.353
T	8.219		6.495		0.529		4.33	
P	<0.0001 .		<0.0001		Non - significant		<0.007	

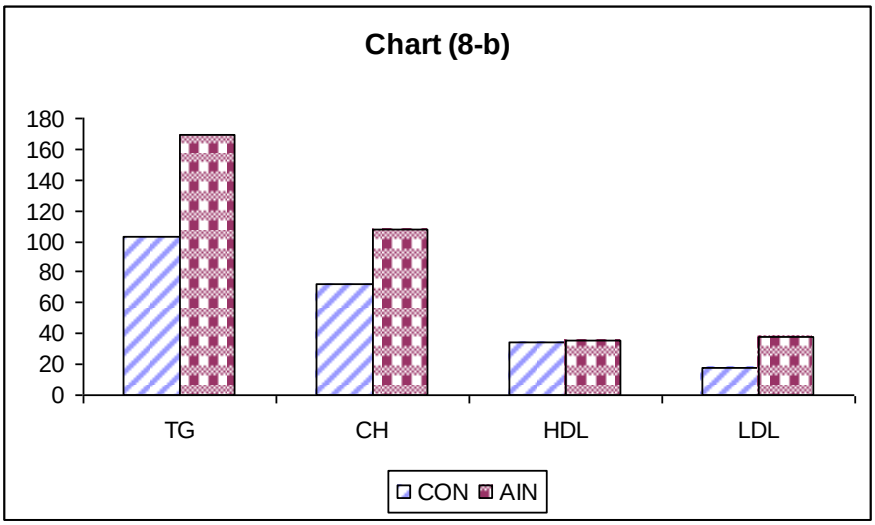
*Significant change in comparison to the corresponding group
T: values as compared with the control.
P: values as compared with the control

Effect of L-NAME on corticosterone and blood glucose levels in rats under the effect of acute immobilization stress in comparison with control group.



CON:control
AIN:acute immobilization stress+L-NAME
CORT:corticosterone

Effect of L-NAME on lipid profile in rats under the effect of acute immobilization stress in comparison with control group.



TG:triglyceride
CH:cholesterol

Effect of L-NAME on corticosterone , blood glucose and lipid profile levels in rats under the effect of chronic immobilization stress in comparison with the control group

As shown in table(9a-9b) and chart (9a-9b):
30 mg/kg of L-NAME single subcutaneous with chronic immobilization stress leads to :

Significant increase in corticosterone level in blood from 11.8 ± 1.22 in control group to 15.9 ± 2.03 in group exposed to chronic immobilization stress (P<0.002). Significant increase in blood glucose level from 88.2 ± 7.78 in control group to 196.7± 12.63 in group exposed to chronic immobilization stress (P<0.0001). Significant increase in triglyceride level from 103.3 ±17.07 in control group to 160.2 ± 11.87 in group exposed to chronic immobilization stress (P<0.0001). Significant increase in total cholesterol level from 72.67 ± 9.75 in control group to 96.2 ± 8 in group exposed to chronic immobilization stress (P<0. 001). Non - significant decrease in HDL from 34 ± 8.2 in control group to 31.8 ± 7.36 in group exposed to chronic immobilization stress . Significant increase in LDL from 18 ± 9.97 in control group to 32.3± 3.05 in group exposed to chronic immobilization stress (P<0. 02).

Table (9-a)

Effect of L-NAME on corticosterone and blood glucose levels in rats under the effect of chronic immobilization stress in comparison with control group.

n	Corticosterone ug/dl		glucose mg/dl	
	Control	L-NAME + Ch.imm st.	Control	L-NAME + Ch. Imm. st.
1	12.8	16.4	97	195
2	12.2	17.3	86	217
3	11.3	14.1	77	201
4	13.5	16.8	93	182
5	10.4	12.9	82	185
6	10.7	18.2	94	200
Mean	11.8	*15.9	88.2	196.7*
SD	1.22	2.027	7.78	12.63
SE	0.499	0.827	3.18	5.16
T	4.278		16.65	
P	<0.002		<0.0001	

*Significant change in comparison to the corresponding group
P: values as compared with the control T: values as compared with the control.

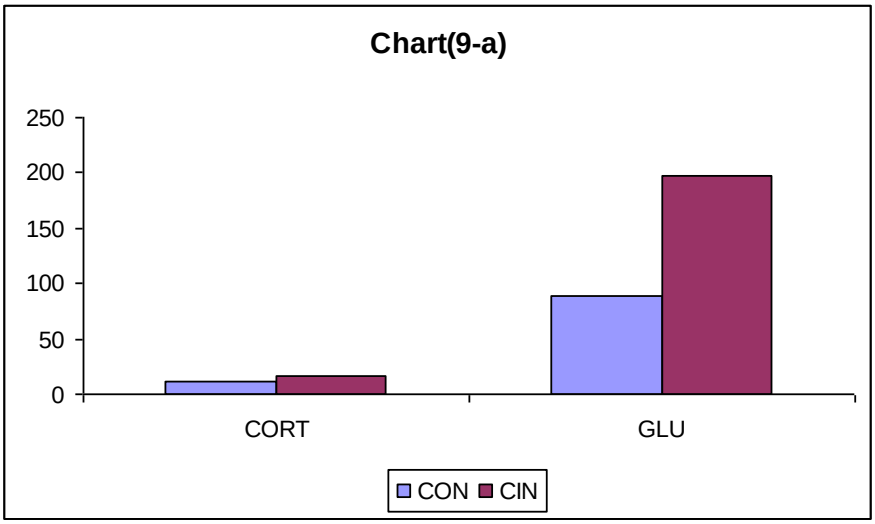
Table (9-b)

Effect of L-NAME on lipid profile in rats under the effect of chronic immobilization stress in comparison with control group.

n	Triglyceride mg/dl		Cholesterol mg/dl		HDL mg/dl		LDL mg/dl	
	Control	L-NAME + Ch.imm.st.	Control	L-NAME + Ch.imm.st.	Control	L-NAME + Ch. Imm. st.	Control	L-NAME + Ch. Imm. st.
1	124	153	80	99	41	40	14.2	28.4
2	107	169	72	105	33	41	17.6	30.2
3	112	166	58	95	24	26	11.6	35.8
4	99	155	65	92	28	29	17.2	32
5	73	143	84	83	32	23	37.4	31.4
6	105	175	77	103	46	32	10	36
Mean	103.3	160.2*	72.67	*96.2	34.00	31.8	18.0	*32.3
SD	17.07	11.87	9.75	8.06	8.17	7.36	9.97	3.05
SE	6.97	4.85	3.981	3.29	3.337	3.00	4.068	1.24
T	6.695		4.550		0.665		3.07	
P	<0.0001		<0.001		Non - significant		<0.02	

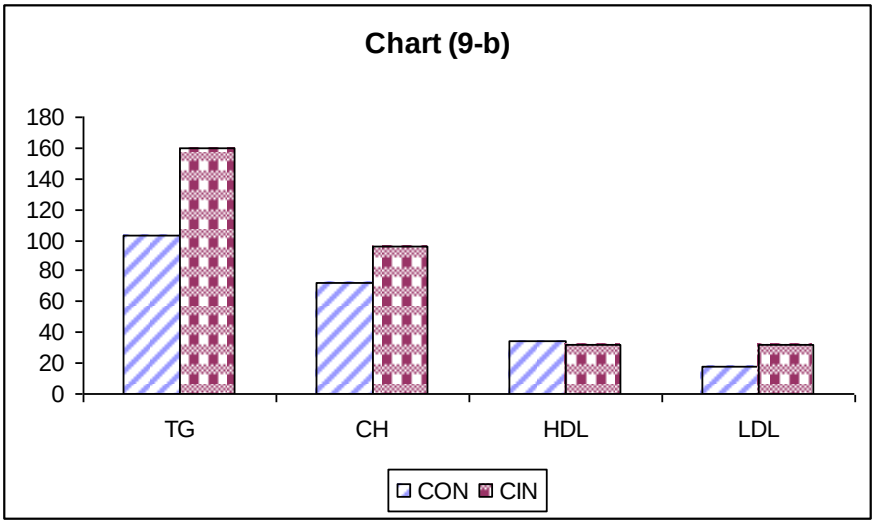
*Significant change in comparison to the corresponding group
T: values as compared with the control.
P: values as compared with the control

Effect of L-NAME on corticosterone and blood glucose levels in rats under the effect of chronic immobilization stress in comparison with control group.



CON:control
CIN:chronic immobilization stress+L-NAME
CORT:corticosterone
GLU:glucose

Effect of L-NAME on lipid profile in rats under the effect of chronic immobilization stress in comparison with control group.



TG:triglyceride
CH:cholesterol

Comparison between the effect of acute cold , acute immobilization and chronic immobilization stress on corticosterone , blood glucose and lipid profile levels with the control group and with each other.

As shown in table(10a-10b) and chart (10a-10b):

Non - significant increase in corticosterone level from 16.9 ± 1.93 in case of cold stress to 19.1±1.95 in case of acute immobilization stress. Non - significant increase in corticosterone level from 16.9 ± 1.9 in case of cold stress to 17.8±3.25 in case of chronic immobilization stress. Non - significant decrease in corticosterone level from 19.1±1.95 in case of acute immobilization stress to 17.8±3.25 in case of chronic immobilization stress. Non - significant decrease in glucose level from 139 ± 8.89 in case of cold stress to 136.2± 12.12 in case of acute immobilization stress**.** Significant increase in glucose level from 139 ± 8.89 in case of cold stress to 202.3 ± 16.19 in case of chronic immobilization stress ($p<0.001$**).** Significant increase in glucose level from 136.2± 12.12 in case of acute immobilization stress to 202.3 ± 16.19 in case of chronic immobilization stress($p<0.002$**)**. Non - significant increase in trigleceride level from 162.67 ± 11.7 in case of cold stress to 166±14.18 in case of acute immobilization stress. Significant decrease in trigleceride level from 162.67 ± 11.7 in case of cold stress to 140 ± 9.12 in case of chronic immobilization stress($p<0.004$**).** Significant decrease in trigleceride level from 166±14.18 in case of acute immobilization stress to 140 ± 9.12 in case of chronic immobilization stress($p<0.004$**)**. Non - significant increase in cholesterol level from 97.67 ± 5.85 in case of cold stress to 98.8±5.56 in case of acute immobilization stress. Non - significant decrease in cholesterol level from 97.67 ± 5.85 in case of cold stress to 94.8± 6.79 in case of chronic immobilization stress. Non - significant increase in HDL level from 35.8±6.49 in case of cold stress to 36.8± 7.08 in case of acute immobilization stress. Non - significant decrease in HDL level from 35.8±6.49 in case of cold stress to 35.5± 6.09 in case of chronic immobilization stress. Non - significant decrease in HDL level from 36.8± 7.08 in case of acute immobilization stress to 35.5± 6.09 in case of chronic immobilization stress. Non - significant decrease in LDL level from 29.3±2.72 in case of cold stress to 28.8± 10.11 in case of acute immobilization stress. Non - significant increase in LDL level from 29.3±2.72 in case of cold stress to 31.3± 4.94 in case of

chronic immobilization stress. Non - significant increase in LDL level from 28.8± 10.11 in case of acute immobilization stress to 31.3± 4.94 in case of chronic immobilization stress.

Table(10-a)

Comparison between the effect of acute cold , acute immobilization and chronic immobilization stress on corticosterone and blood glucose levels in comparison with the control group and with each other.

n	Corticosterone ug/dl				Glucose mg/dl			
	control	Cold stress	A.imm stress	Ch.imm. stress	control	Cold stress	A.imm stress	Ch.imm. stress
Mean	11.8	16.9*	19.1*	17.8*	88.2	*139	*136.2	*202.3
SD	1.22	1.93	1.95	3.25	7.78	8.89	12.12	16.19
SE	0.499	0.786	0.795	1.33	3.18	3.63	4.96	6.61
T	-----	5.424	7.796	4.184	-----	10.64	7.10	18.39
T1		-----	2.028	0.573		-----	0.435	7.793
T2			-----	0.894			-----	6.068
P	-----	<0.0001	<0.0001	<0.002	-----	<0.0001	<0.001	<0.0001
P1		-----	NS	NS		-----	NS	<0.001
P2			-----	NS			-----	<0.002

*Significant change in comparison to the corresponding group
T: values as compared with the control.
T1: values as compared with cold stress.
T2: values as compared with acute imm. stress.
P: values as compared with the control.
P1: values as compared with cold stress.
P2: values as compared with acute imm. stress.