RESULTS

After assaying serum level of gastrin, albumin and esophageal manometric study for all groups of patients as explained in methods.

Results were classified in the following tables.

Table (3): Main data of control subjects that have normal renal functions.

No	Urea mg/dl	Cr. mg/dl	K mg/dl	Na mg/dl	Age/ Years	Duration of disease /Months	Causes on clinical data	HB %
1	20	1.2	3.9	139	55	0	0	80
2	17	0.9	4.5	139	40	0	0	90
3	20	0.9	3.9	141	60	0	0	85
4	25	0.7	3.7	139	45	0	0	90
5	20	0.8	4	130	40	0	0	85
6	17	0.9	3.8	135	35	0	0	70
7	20	0.7	3.7	134	36	0	0	80
8	30	0.8	4.2	134	40	0	0	90
9	20	1	3.7	135	45	0	0	90
10	27	0.9	4	130	50	0	0	80
Number	10	10	10	10	10	10	10	10
Mean	21.6	0.88	3.94	135.6	44.6	0		82

Table (4): Main data of chronic renal failure cases on regular hemodialysis (group A).

No	Urea mg/dl	Cr mg/dl	K mg/dl	Na mg/dl	Age/years	Duration of disease/ months	Causes that were known	HB %
1	90	5.5	3.5	134.5	38	20	G.N	40%
2	91	6.3	4	135	40	38	G.N	70%
3	139	12.7	4.9	149	50	29	HTN	50
4	170	10.5	2.8	141.3	43	29	HTN	55
5	95	4.5	7.3	140	42	20	HTN	75
6	133	10	5.4	125	60	34	Obst.	60
7	98	8.5	2.8	137	48	34	G.N	50
8	86	5.4	5	130	41	16	G.N	75
9	130	7.3	3.6	158	54	16	HTN	60
10	86	5.8	4.3	135	28	15	G.N	50
11	102	8.2	4.3	133	40	20	G.N	70
12	159	11.5	8.6	139	54	30	Obst.	60
13	155	4.5	5.6	134	47	34	Obst.	70
14	164	11.6	6.9	149	50	14	Obst.	62
15	186	14.5	3.3	144	55	15	Obst.	60
16	89	5.4	3.5	135	37	20	G.N	70
17	90	6.4	4	130	41	38	G.N	40
18	140	12.5	6	149	51	28	HTN	60
19	96	10.7	3	140	41	20	HTN	46
20	180	4.3	7	139	61	32	Obst.	69
21	98	10.2	5.1	124	48	34	Obst.	50
22	86	8.1	2.7	115	42	17	G.N	75
23	110	4.4	4.9	110	53	15	G.N	60
24	86	11.1	3.6	150	58	21	HTN	50
25	100	7.1	4.3	135	29	22	Obst.	60
Number	25	25	25	25	25	25	25	25
Mean	118.36	8.28	4.656	136.432	46.04	24.44		59.16

Table (5): Main data of chronic renal failure cases, those were on conservative treatment (group B).

N	Urea mg/dl	Cr mg/dl	K mg/dl	Na mg/dl	Age/ Year	Duration of disease/ Months	Causes that were known	HB %
1	116	7.7	6	140	55	24	HTN	70
2	76	2.7	4.3	133	50	36	G.N	60
3	86	2.6	5.2	144	60	24	G.N	80
4	120	4.11	3.6	136	45	36	HTN	70
5	133	3.5	5.1	149	50	12	HTN	50
6	120	2.5	3.6	130	42	1	G.N	60
7	146	3.6	5.2	135	52	24	HTN	80
8	105	5.5	5.8	139	55	7	G.N	60
9	110	7.4	7.1	135	40	24	HTN	80
10	111	4	5.8	135	60	24	G.N	70
11	115	6.5	5	143	60	12	HTN	80
12	77	3.7	4.3	130	50	36	G.N	60
13	90	3.6	5.2	135	55	12	HTN	70
14	124	5.11	3.5	146	45	24	HTN	50
15	140	2.5	5.2	145	55	9	G.N	80
16	127	3.5	3.1	134	40	36	G.N	70
17	139	6.6	5.7	135	54	17	HTN	80
18	110	5.4	5.8	140	50	10	HTN	60
19	103	4	6.1	134	45	20	G.N	50
20	111	7.7	5.5	135	55	24	G.N	70
21	110	3.7	6	135	60	12	HTN	80
22	82	3.6	4.2	140	50	36	G.N	70
23	120	3	4.2	140	65	24	HTN	80
24	135	3.5	3.7	142	40	12	HTN	70
25	140	5.5	5	130	50	6	G.N	85
Number	25	25	25	25	25	25	25	25
Mean	113.84	4.4608	4.968	137.6	51.32	20.08		69.4

G.N= (Glomerulonephritis), H.T.N. = (Hypertension), obst. = (Obstructive uropathy). Cr= Createnine

Manometric examination results of lower esophageal sphincter (tables 6,7and 8):

Table (6): Lower esophageal sphincter (LES) resting pressure in studied groups.

	ALL cases of CRF	Group (A)	Group (B)	Control
Number of cases	50	25	25	10
Mean ± S.D. mmHg	39.47 ±11.86	40.28±10.89	38.65±12.93	26.39±4.85
All Vs. Control	T test –3.410, p< 0.0012 significant high LES pressure in CRF patients.			
Group (A) Vs. Control	T test –3.856, p<0.0002 significant high LES pressure in group (A) patients.			
Group (B) vs. Control	T test –2.37 p< 0.0237 significant high LES pressure in group (B) patients.			

This table showed significant high LES resting pressure in CRF patients group (A) on hemodialysis and group (B) on conservative treatment in comparison to control subjects.

Table (7): Lower esophageal sphincter percent of relaxation in studied groups.

	ALL cases	Group (A)	Group (B)	Control
Number of cases	**50**	**25**	**25**	**10**
Mean ± S.D. %	**91.34±5.73**	**90.20±6.49**	**92.47±4.73**	**96.61±2.64**
All vs. Control	**T test 2.834, p<0.0063, significant high % of relaxation control subjects.**			
Group (A) vs. Control	**T test 3.002, p<0.0051, significant high % of relaxation in control subjects.**			
Group (B) vs. Control	**T test 2.598, p<0.0139, significant high % of relaxation in control subjects.**			

This table showed significant high percentage of LES relaxation in control subjects in comparison to CRF patients group (A) on hemodialysis and group (B) on conservative treatment

Table (8): Lower esophageal sphincter residual pressure on relaxation in studied groups.

	ALL cases	Group(A)	Group(B)	Control
Number of cases	50	25	25	10
Mean ± S.D. mmHg	3.27±1.96	3.77±2.12	2.78±1.68	0.94±0.44
All vs. Control	T test –3.727, p<0.0004, significant high residual pressure in all CRF patients.			
Group (A) vs. Control	T test 4.148, p<0.0002, significant high residual pressure in group (A) patients.			
Group (B) vs. Control	T test –3.388, p<0.0018, significant high residual pressure in group (B) patients.			

This table showed significant high residual pressure on LES relaxation in CRF patients group (A) on hemodialysis and group (B) on conservative treatment in comparison to control subjects.

Manometric examination of the lower esophageal sphincter shows that higher resting pressure and residual pressure on relaxation were found in CRF patients than control subjects but control subjects were found to have higher percent of relaxation than CRF patients.

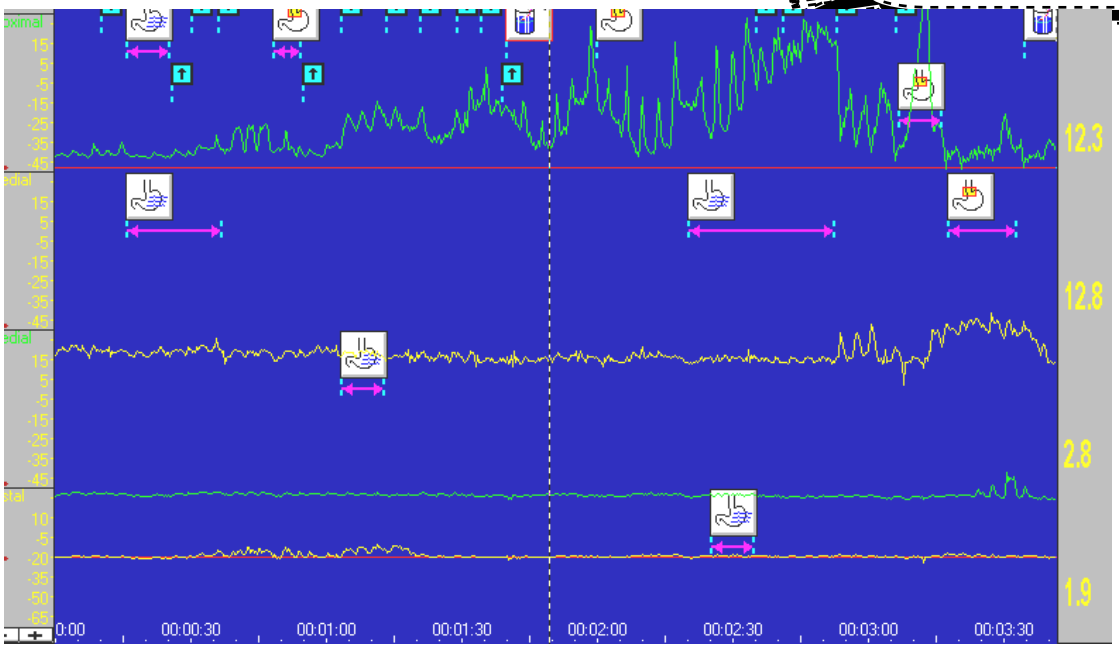

Fig. (28)

Case on hemodialysis with LES study shows that LES pressure 42.4.1mmHg, %of relaxation =98.6and residual pressure2.6mmHg. Dotted line marks the LES resting pressure and relaxation following wet swallow in proximal channels.

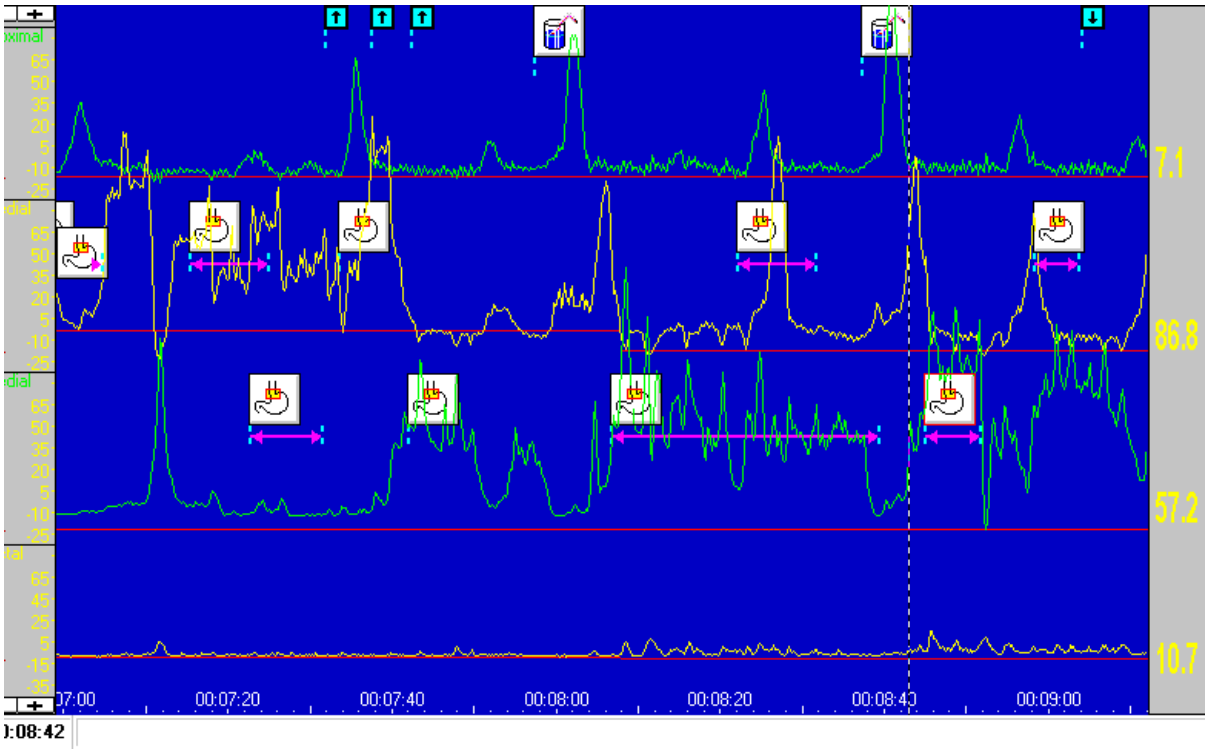

Fig. (29)

Case on hemodialysis with LES study shows that LES pressure 61.1mmHg, %of relaxation =97.7and residual pressure1.1mmHg. Dotted line marks the LES resting pressure and relaxation following wet swallow in three channels.

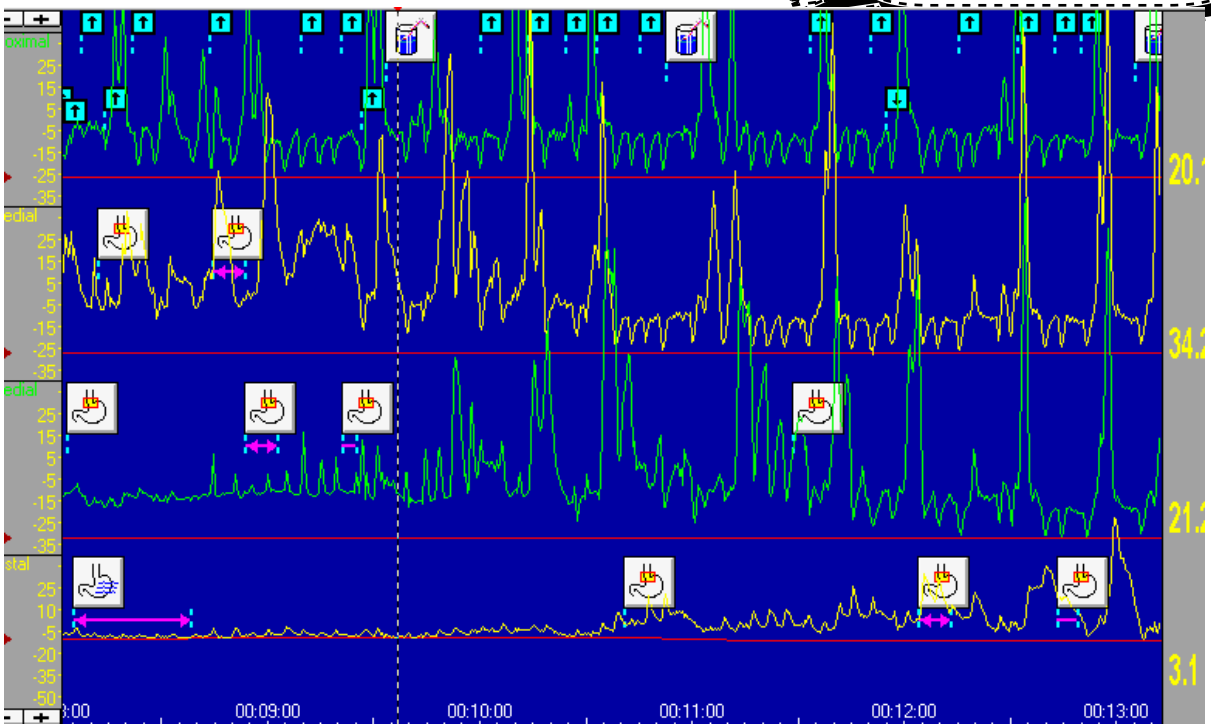

Fig. (30)

Case on hemodialysis with LES study shows that LES pressure 36.1mmHg,%of relaxation =88.3and residual pressure3.7 mmHg. Dotted line marks the LES resting pressure and relaxation following wet swallow in upper three channels.

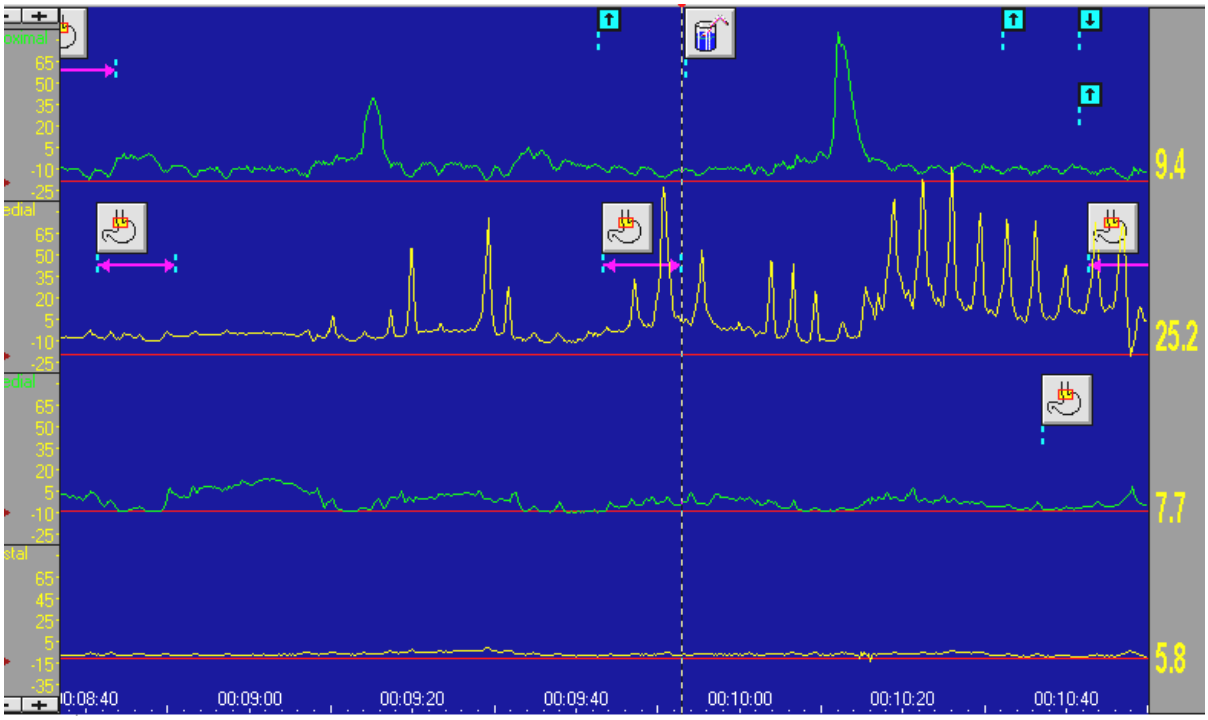

Fig. (31)

Case on conservative treatment with LES study shows that LES pressure 45.4mmHg,%of relaxation =90.9%and residual ressure3.5 mmHg. Dotted line marks the LES resting pressure and relaxation following wet swallow in upper two channels.

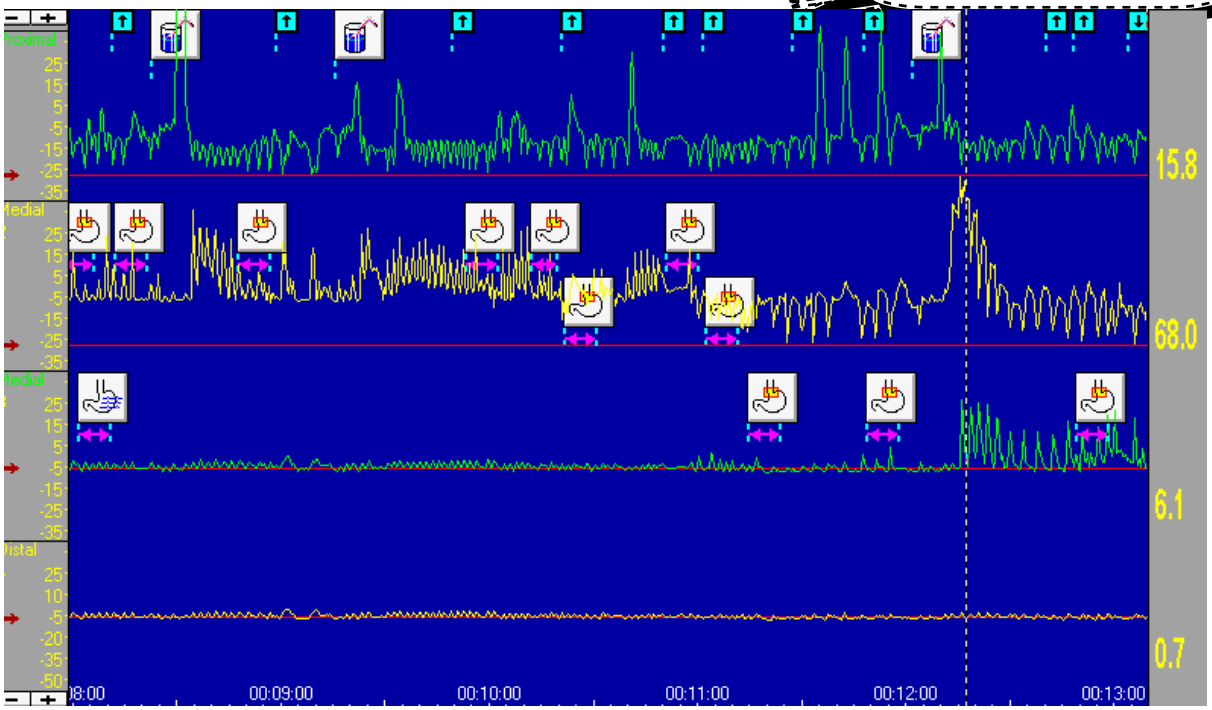

Fig. (32)
Control subject with LES study shows that LES pressure 25.9mmHg,%of relaxation =97.1%and residual pressure0.7 mmHg. Dotted line marks the LES resting pressure and relaxation following wet swallow in upper three channels.

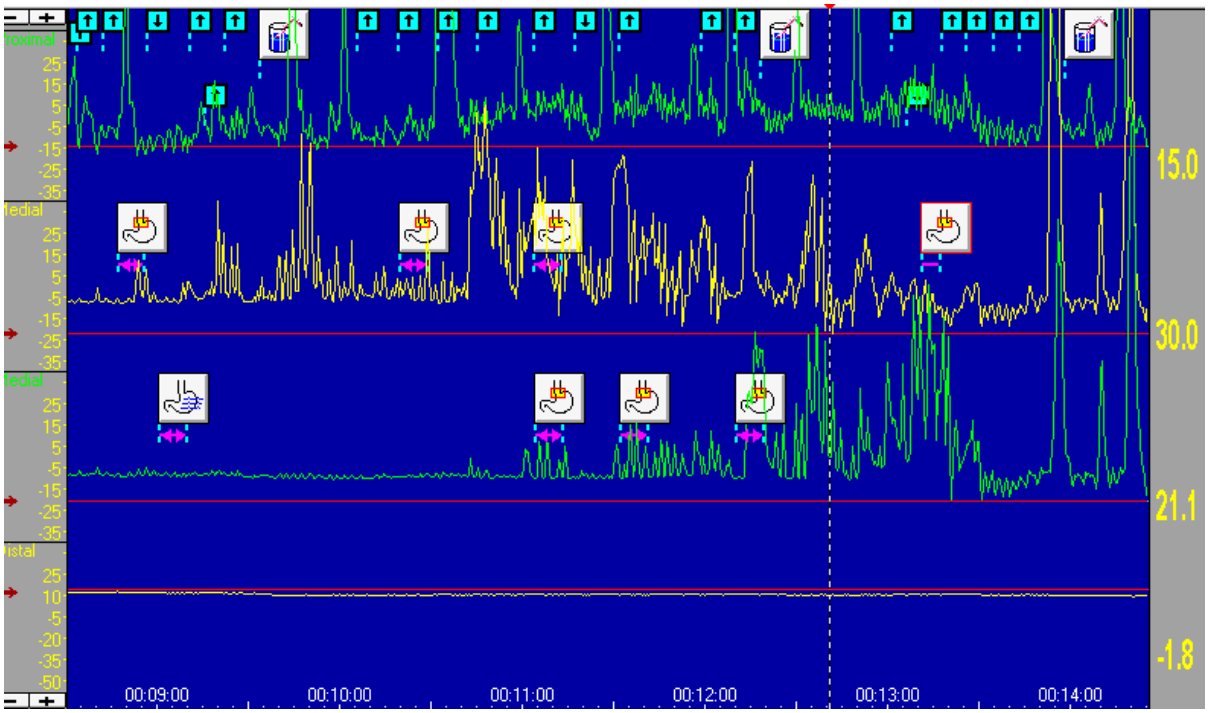

Fig. (33)
Case on hemodialysis with LES study shows that LES pressure 37.8mmHg, %of relaxation =89.9and residual pressure 4mmHg. Dotted line marks the LES resting pressure and relaxation following wet swallow in upper three channels.

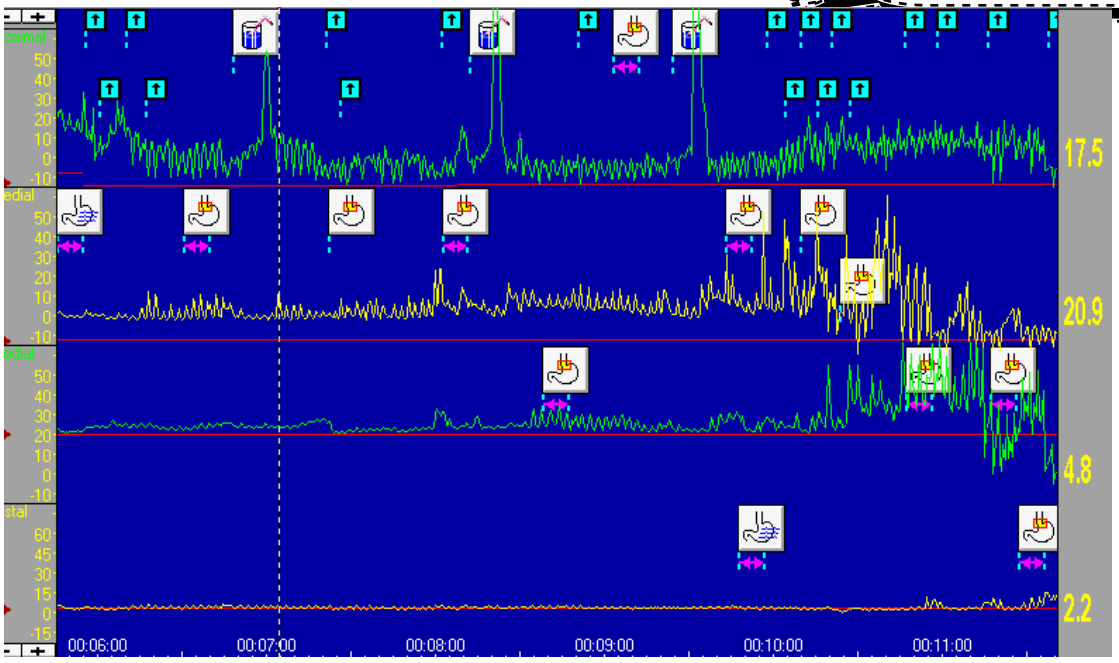

Fig. (34)

Case on hemodialysis with LES study shows that LES pressure22.7mmHg, %of relaxation =89.9and residual pressure 3.7mHg. Dotted line marks the LES resting pressure and relaxation following wet swallow in upper two channels.

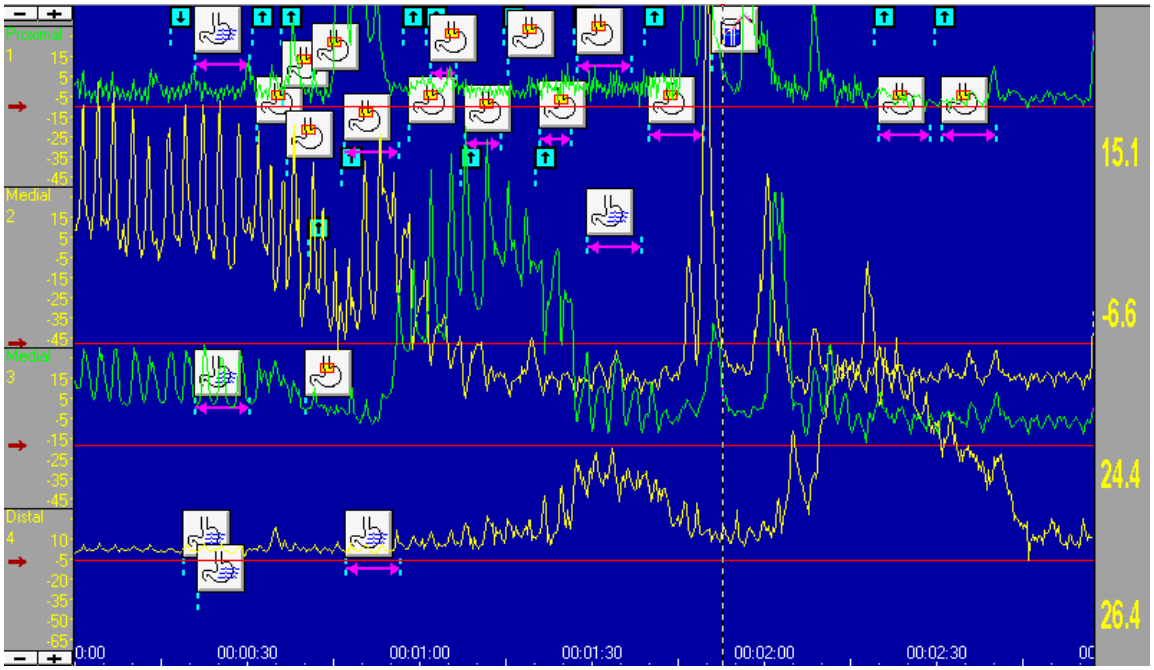

Fig. (35)

Case on hemodialysis with LES study shows that LES pressure50.5mmHg, %of relaxation =80.2and residual pressure 7.7mHg. Dotted line marks the LES resting pressure and relaxation following wet swallow in distal two channels.

Manometric examination results of esophageal motility (tables 9-16):

Table (9): Percentage of normal peristalsis in studied groups.

	ALL cases	Group(A)	Group(B)	Control
Number of cases	50	25	25	10
Mean± S.D.%	19.98±24.54	31.4±28.695	8.56±11.58	52±36.424
All vs. Control	Ttest3.457, p<0.0748, significant high %of normal peristalsis in control subjects.			
Group(A) vs. Control	T test 1.776, p>0.085, nonsignificant difference between both groups.			
Group(B) vs. Control	T test5.413, p<0.0001 significant high %of normal peristalsis in control subjects.			
Group (A) Vs. Group (B)	T test 3.6 p<0.0006 significant high %of normal peristalsis in Group (A).			

This table showed significant high percentage of normal peristalsis in control subjects in comparison to CRF patients group (A) on hemodialysis and group (B) on conservative treatment.

CRF patients group (A) were found to have significant high percentage of normal peristalsis in comparison to group (B).

Table (10): Percentage of simultaneous contractions in studied groups:

Table (7)	ALL cases	Group (A)	Group (B)	Control
Number of cases	50	25	25	10
Mean ± S.D. %	4±10.04	4.8±9.0416	3.2±11.075	3±4.8305
All vs. Control	T test 0.064, p>0.760, nonsignificant difference between both groups.			
Group (A) vs. Control	T test 0.593, p>0.55, nonsignificant difference between both group.			
Group (B) vs. Control	T test 0.055, p>0.95, nonsignificant difference between both groups.			

This table showed nonsignificat difference in percentage of esophageal simultaneous contractions in CRF patients in both groups in comparison to control subjects.

Table (11): Percentage of multipeaked contractions in studied groups:

	ALL cases	Group (A)	Group (B)	Control
Number of cases	50	25	25	10
Mean % ± S.D.	5.18±7.49	4.8±9.0416	3.2±11.075	3±4.8305
All vs. Control	T test 1.104, p>0.274, nonsignificant difference between both groups.			
Group (A) vs. Control	T test 1.092, p>0.283, nonsignificant difference between both groups.			
Group (B) vs. Control	T test 1.092, p0.283, nonsignificant difference between both groups.			

This table showed nonsignificat difference in percentage of esophageal multipeaked contractions in CRF patients in both groups in comparison to control subjects.

Table (12): Percentage of uncoordinated esophageal peristalsis in studied groups.

	ALL cases	Group (A)	Group (B)	Control
Number of cases	**50**	**25**	**25**	**10**
Mean% ± S.D.	**65.62±27.38**	**59.28±95.24**	**71.96±27.82**	**46±32.73**
All vs. Control	**T test-2.003, p<0.0499, significant high %of uncoordinated peristalsis in all CRF patients.**			
Group (A) vs. Control	**T test –1.2636, p> 0.1021, nonsignificant difference between both groups.**			
Group (B) vs. Control	**T test-2.37, p<0.0237, significant high %of uncoordinated peristalsis in UD patients.**			

This table showed significant high percentage of uncoordinated esophageal peristalsis in CRF patients group (B) on conservative treatment in comparison to control subjects.

Table (13): Uncoordinated peristalses percentage distribution in studied groups.

	Normal<30%	Mild degree 30%-40%	Moderate degree 50-60%	Severe degree>60%
Group (A) cases	8%(2/25)	20%(5/25)	28%(7/25)	44%(11/25)
Group (B) cases	0%	16%(4/25)	8% (2/25)	76%(19/25)
Control	40%(4/10)	0%	10%(1/10)	50%(5/10)

This table showed 76% of cases group (B) on conservative treatment has severe degree of uncoordinated peristalsis in comparison to 44% was found in group (A) on hemodialysis treatment and 50%of control subjects.

Table (14): Percentage of hypotensive contractions in studied groups:

	ALL cases	Group (A)	Group (B)	Control
Number of cases	**50**	**25**	**25**	**10**
Mean± S.D. %	**3.4 ±8.54**	**2.8±7.5056**	**4±9.574**	**2±6.3246**
All vs. Control	**T test0.491, p>0.625, nonsignificant difference between both groups.**			
Group (A) vs. Control	**T test 0.297, p> 0.768, nonsignificant difference between both groups.**			
Group (B) vs. Control	**T test0.607, p>0.548, nonsignificant difference between both groups.**			

This table showed nonsignificat difference in percentage of esophageal hypotensive contractions in CRF patients in both groups in comparison to control subjects.

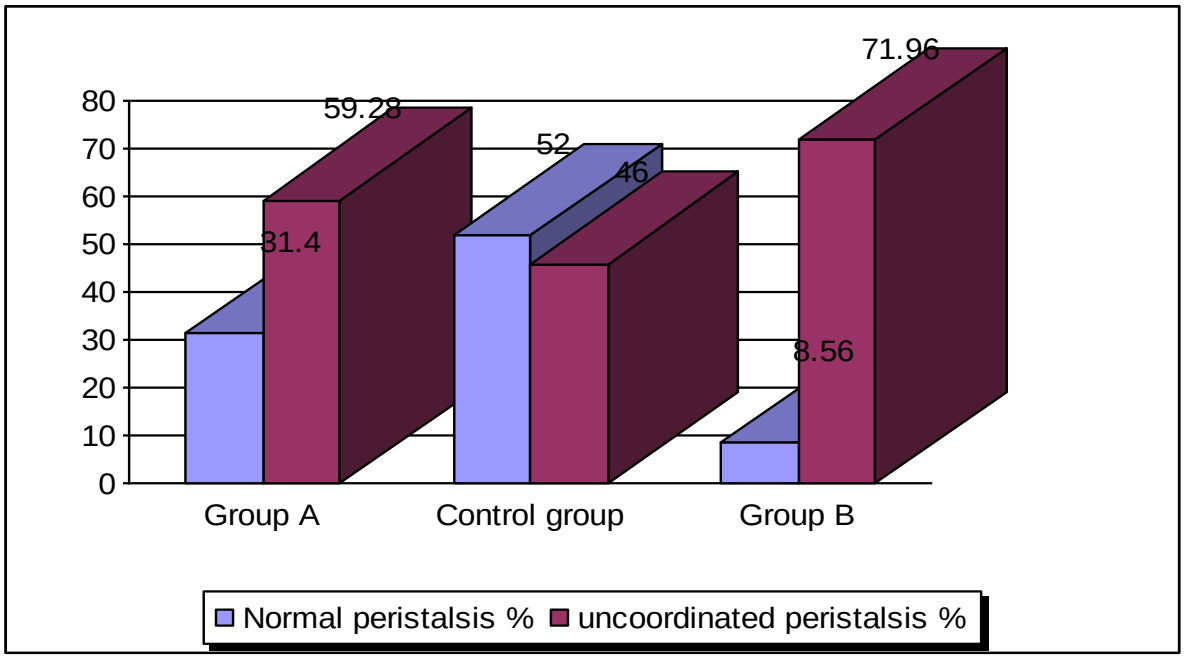

Fig (36)

Normal peristalsis percentages and uncoordinated peristalsis percentages in CRF both groups and control subjects.

Table (15): Amplitude of distal esophageal contractions in studied groups:

	All cases	Group(A)	Group(B)	Control
Number of cases	50	25	25	10
Mean/ mmHg ± S.D	86.46±27.16	95.4±25.05	77.88±26.88	60.99±21.61
All vs.. Control	T test –2.789, p<0.0071, significant high amplitude of contraction in all CRF patients			
Group (A) vs. Control	T test-3.765, p< 0.0007 significant high amplitude of contraction in group (A) patients			
Group (B) vs. Control	T test1.766, p>0.0866, non significant difference between both groups			

This table showed significant high amplitude of esophageal contractions in CRF patients group (A) on hemodialysis treatment in comparison to control subjects.

Table (16): Mean Duration of esophageal contractions in studied groups.

	ALL cases	Group(A)	Group(B)	Control
Number of cases	50	25	25	10
Mean ± S.D. sec.	5.13±1.48	5.64±1.69	3.2±11.075	3.7±1.19
All vs. Control	T test-2.872 p<0.0057, significant prolonged duration in all CRF patients			
Group (A) vs.. Control	T test-3.301, p< 0.0023, significant prolonged duration in group (A) patients.			
Group (B) vs. Control	T test 1.931, p>0.0622, nonsignificant difference between both groups			

This table showed significant prolonged duration of esophageal contractions in CRF patients group (A) on hemodialysis treatment in comparison to control subjects.

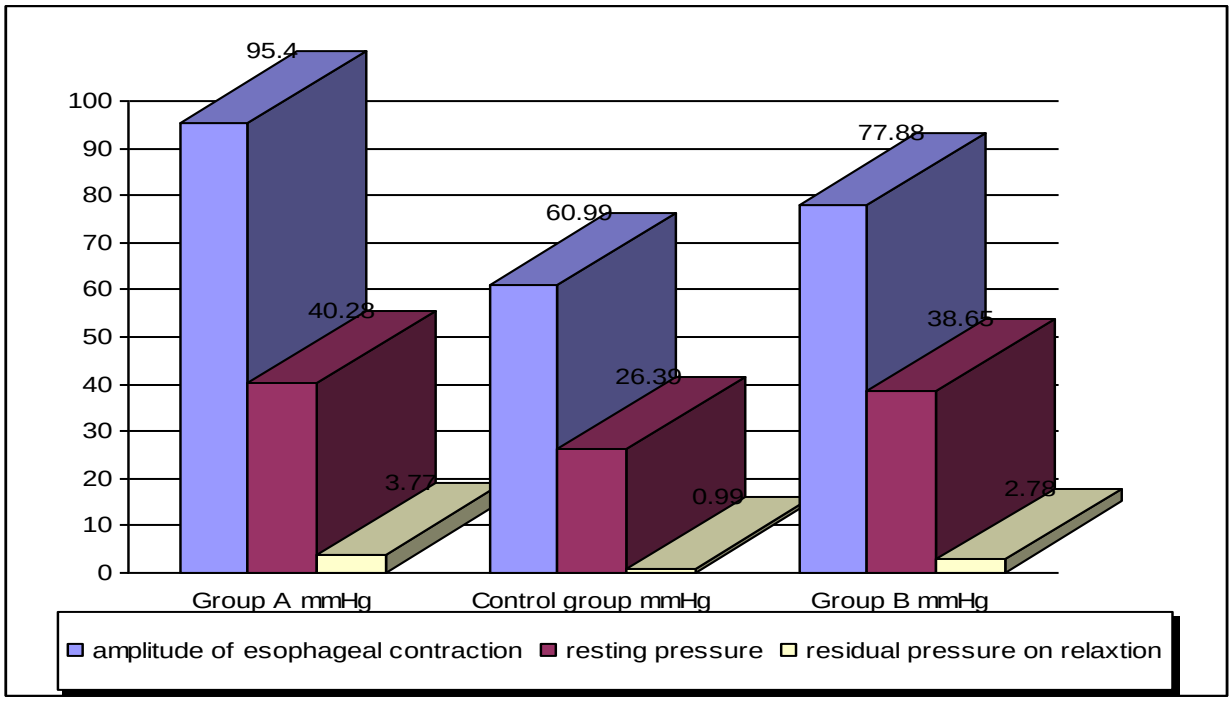

Fig (37)

Patients with CRF on hemodialysis treatment have significant increased amplitude of distal esophageal contraction, residual pressure on LES relaxation and resting LES pressure but patients on conservative treatment have significant high percent of uncoordinated contractions.

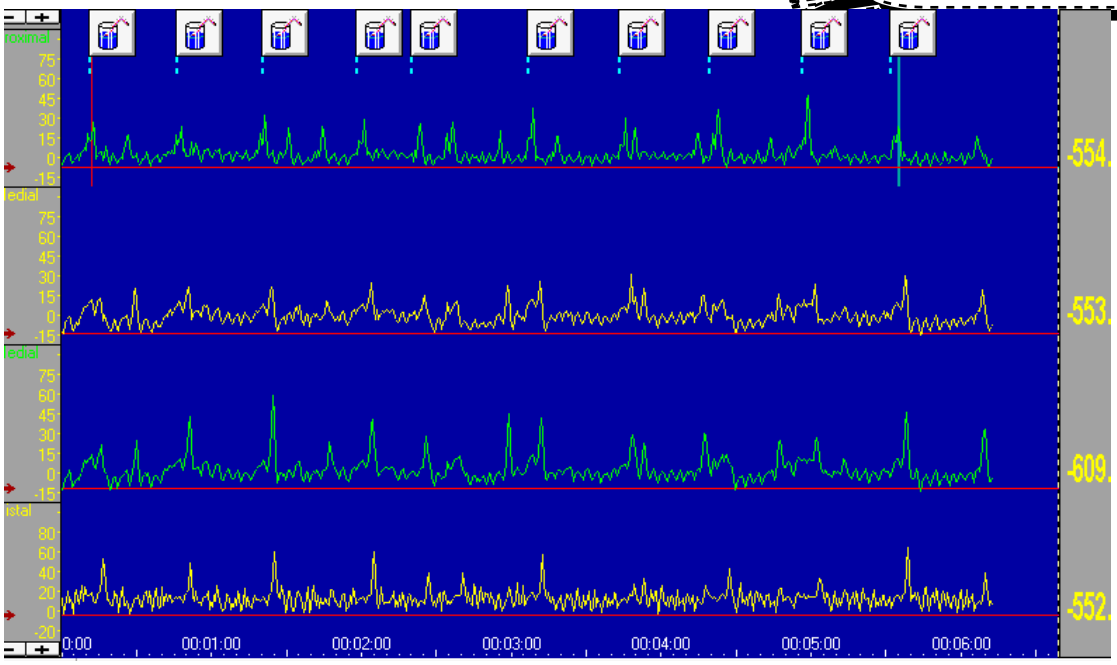

Fig. (38)

Case on conservative treatment with esophageal body motility study shows that mean contraction amplitude40 mmHg, 90%uncoordinatrd contractions, 90% hypertensive contractions, 6% multipeaked contractions, mean duration of contraction4.2, and 10%normal peristalses.

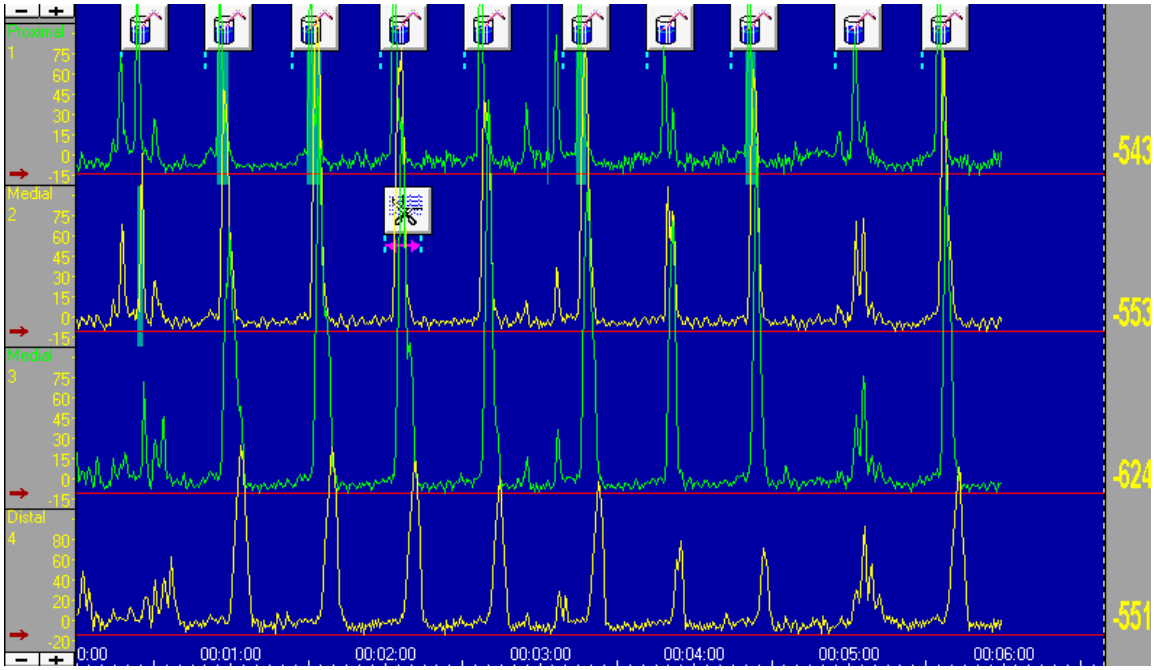

Fig (39)

Case on hemodialysis with esophageal body motility study shows that mean contraction amplitude129.1mmHg, 80%uncoordinatrd contractions, 10% hypertensive contractions, . mean duration of contraction5.3, and 10%normal peristalses.

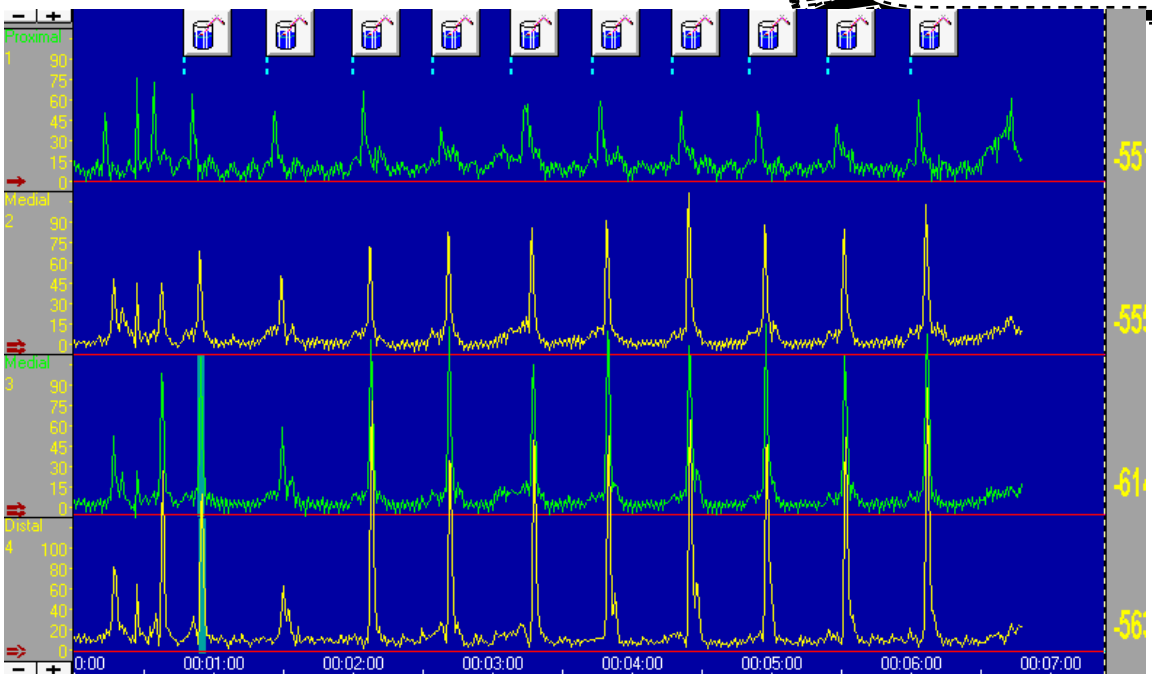

Fig. (40)

Case on hemodialysis with esophageal body motility study shows that mean contraction amplitude125.7mmHg, 40%uncoordinatrd, contractions,30%simultaneous peristalses, 20%hypertensive contractions, 19% multipeaked contractions mean duration of contraction6.7sec., and 10%normal peristalses .

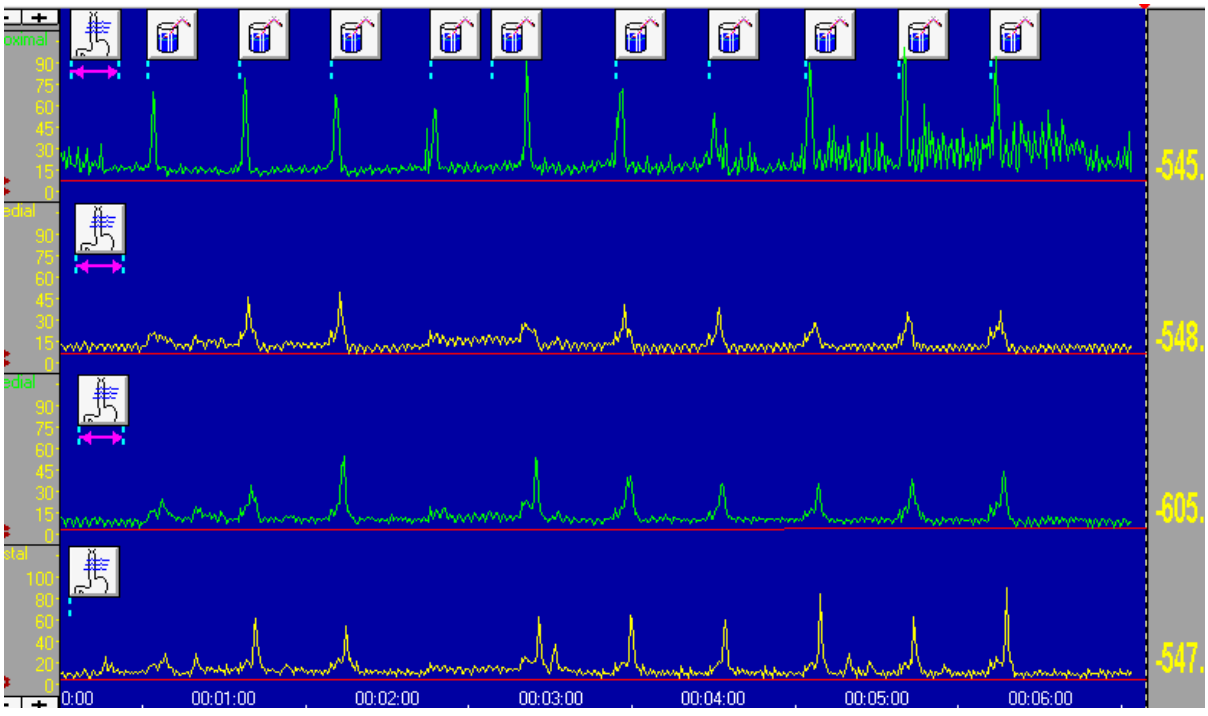

Fig. (41)

Control subject with esophageal body motility study shows that mean contraction amplitude47.0mmHg, 60%uncoordinatrd contraction mean duration of contraction 4.7sec., and 40% normal peristalses.

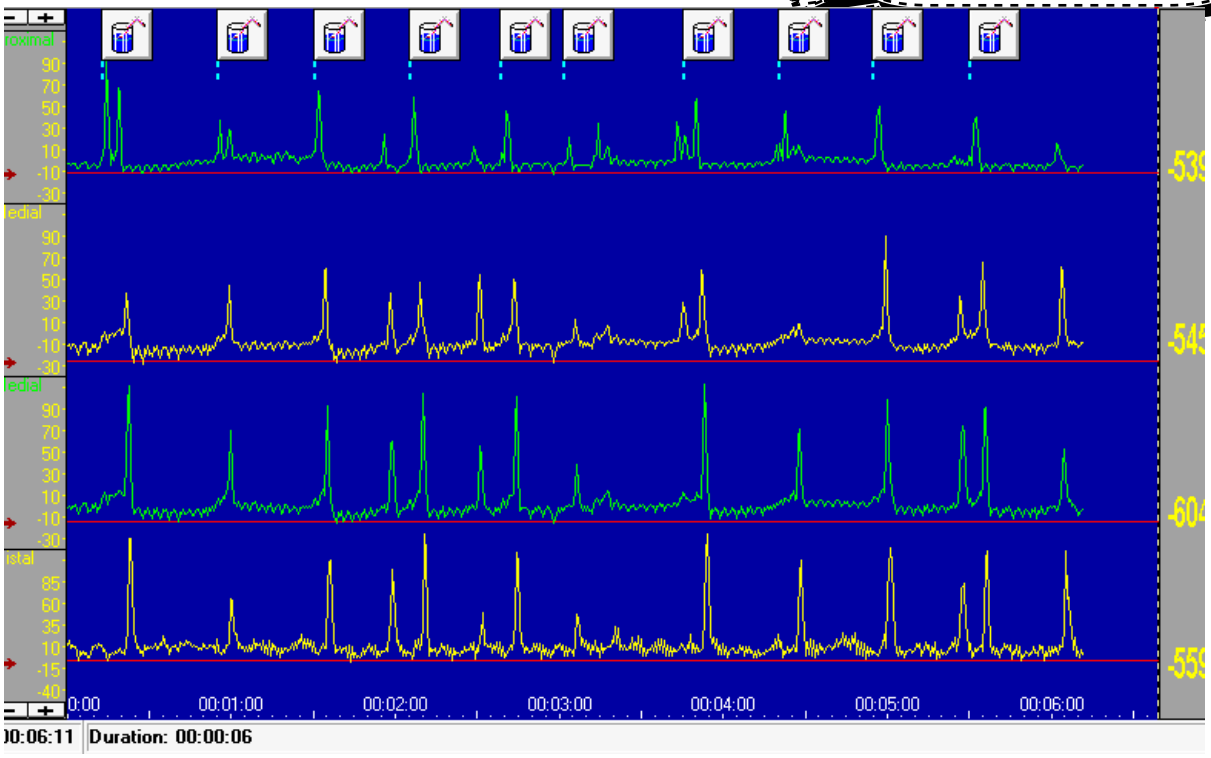

Fig. (42)

Case on conservative treatment with esophageal body motility study shows that mean contraction amplitude 86.4, 100 % uncoordinated contractions, 17 multipeaked contractions, mean duration of contraction 5.0 sec. and 0%normal peristalses.

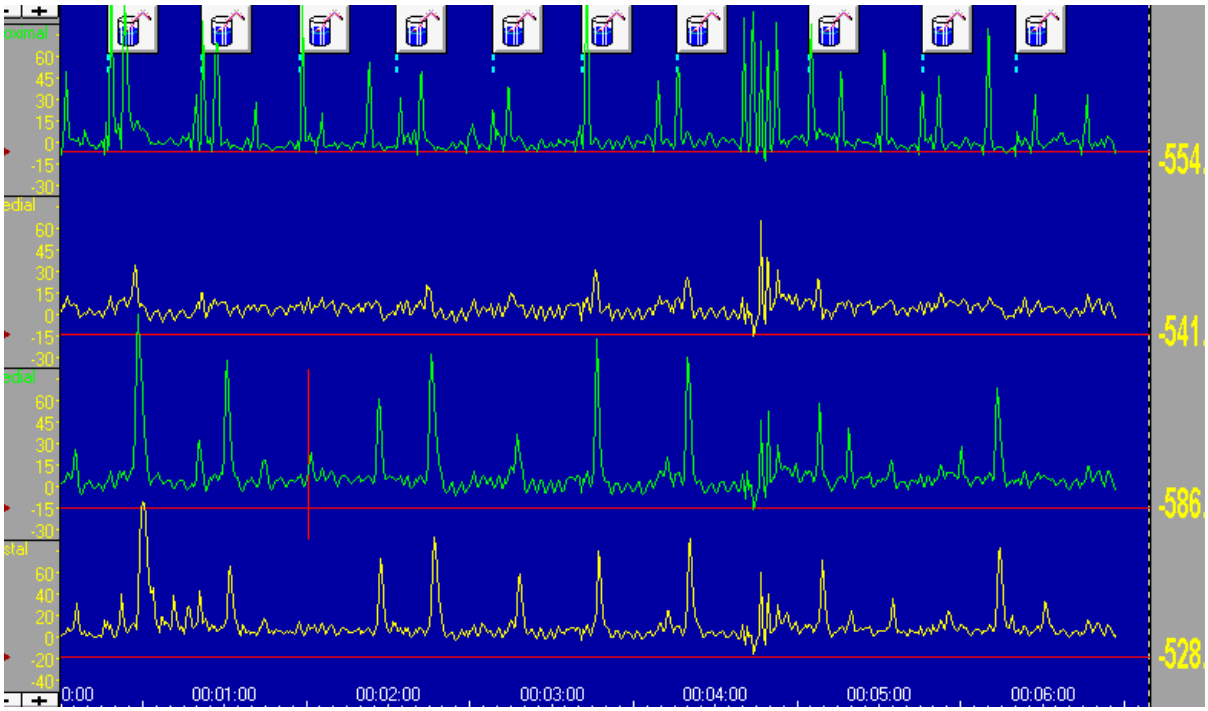

Fig. (43)

Case on conservative treatment with esophageal body motility study shows that mean contraction amplitude 112.3, 40 % uncoordinated contractions, 3% multipeaked contractions, mean duration of contraction 6.9 sec. 40%simultaneous contractions and 20%normal peristalses

Table (17): Upper esophageal sphincter resting pressure (UES) in studied groups:

	ALL cases	Group (A)	Group (B)	Control
Number of cases	50	25	25	10
Mean/mmHg ± S.D. mmHg	40.78±16.60	40.108±11.622	41.46±20.657	38.64±13.88
All vs.. Control	T test, p>0.060, nonsignificant difference between both groups.			
Group (A) vs.. Control	T test, p>0.060 nonsignificant difference between both groups			
Group (B) vs.. Control	T test, p>0.060 nonsignificant difference between both groups			

This table showed nonsignificat difference in resting pressure of UES in CRF patients in both groups in comparison to control subjects.

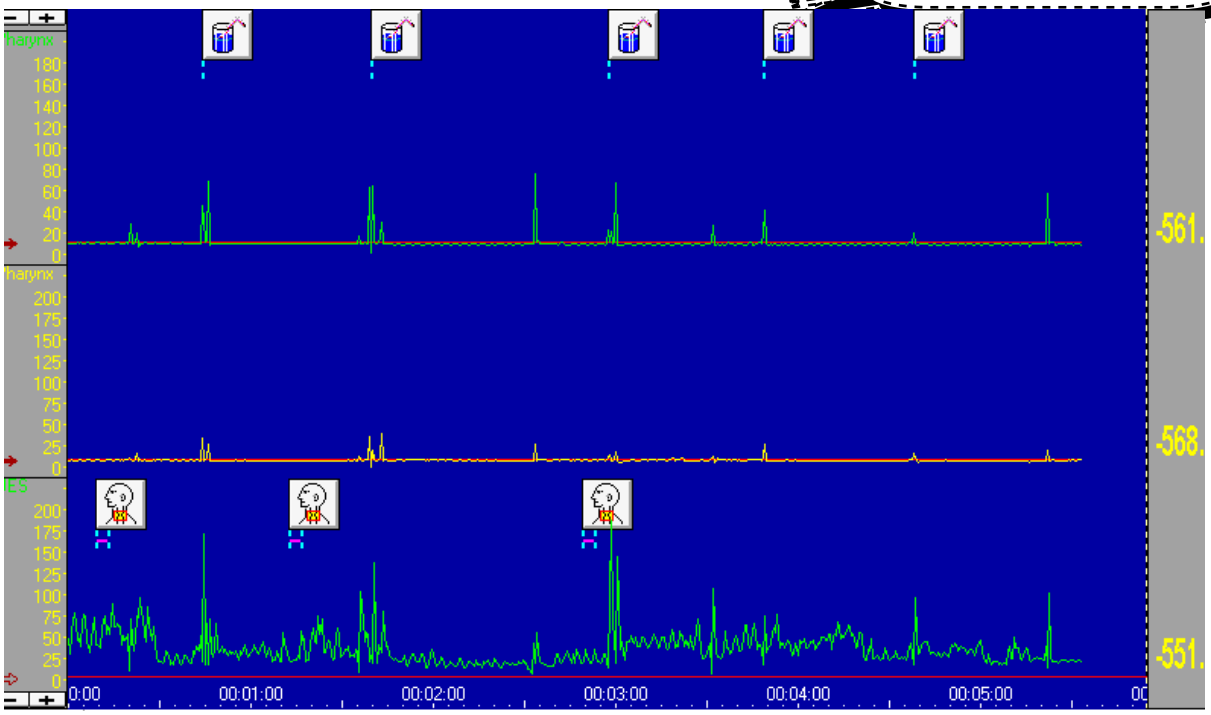

Fig. (44)
Control subject with upper esophageal sphincter study show that mean resting pressure 51.9mmHg.

Table (18): Fasting gastrin hormone level in studied groups.

NO.	Gastrin level in-group (A). Pg/dl	Gastrin level in-group (B). Pg/dl	Gastrin level in- control group. Pg/dl
1	126	92.5	60
2	135	58.3	17
3	250	140	20
4	70	95	30
5	96	230	15
6	110	90	20
7	126	111	10
8	56	119	15
9	72.5	180	20
10	115	160	20
11	400	90	
12	230	60.3	
13	195	139	
14	62	89	
15	300	229	
16	128	92	
17	133	109	
18	841	120	
19	69	179	
20	93	140	
21	113	75	
22	125	74	
23	57	114	
24	70.5	87	
25	117	58.3	
Number	25	25	10
Mean	163.6	117.256	22.7

Table (19): Fasting serum gastrin level in studied groups:

	ALL cases	Group (A)	Group (B)	Control
Number of cases	50	25	25	10
Mean ± S.D. pg/ml	140.43±121.48	163.6±163.43	117.26±47.96	22.7±14.10
All vs. Control	T test-3.04, p<0.0035, significant high level of gastrin all CRF patients.			
Group (A) vs. Control	T test –2.698, p<0.01 significant high levels of gastrin group (A) patients.			
Group (B) vs. Control	T test 6.083, p<0.0001 significant high levels of gastrin group (B) patients.			
Group (B) vs. Group (A)	T test –1.36, p>0.1800 non-significant difference between both groups.			

Pg=Pico gram.

This table showed significant high concentration of serum gastrin hormone in all CRF patients, group (A) on hemodialysis and group (B) on conservative treatment in comparison to control subjects.

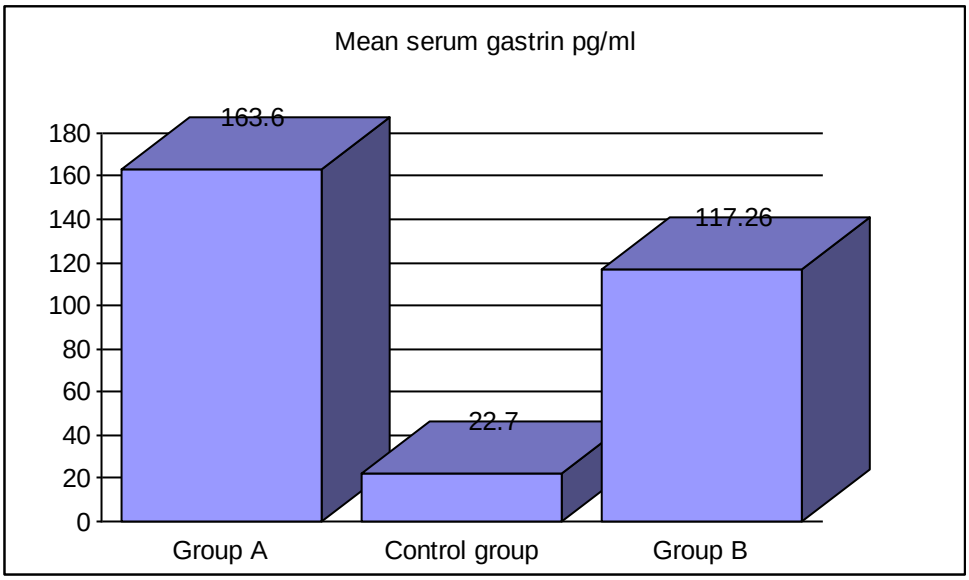

Fig. (45)

Concentration of gastrin hormone: in-group (A) patients on hemodialysis, group (B) on conservative treatment and control subjects.

Table (20): Serum albumin level in studied groups:

	ALL cases	Group (A)	Group (B)	Control
Number of cases	**50**	**25**	**25**	**10**
Mean mg/dl ± S.D.	**3.74 ±0.580**	**3.5±0.53**	**3.97±0.54**	**4.06±0.33**
All vs. Control	**T test 1.71, p>0.932, nonsignificant difference between both groups.**			
Group (A) vs. Control	**T test3.118, p<0.004, significant low albumin level in group (A) patients.**			
Group (B) vs. Control	**T test 0.477, p>0.636, nonsignificant difference between both groups.**			

Mg=milligram. dL=deciliter.

This table showed significant low serum albumin in CRF patients group (A) on hemodialysis treatment in comparison to control subjects.

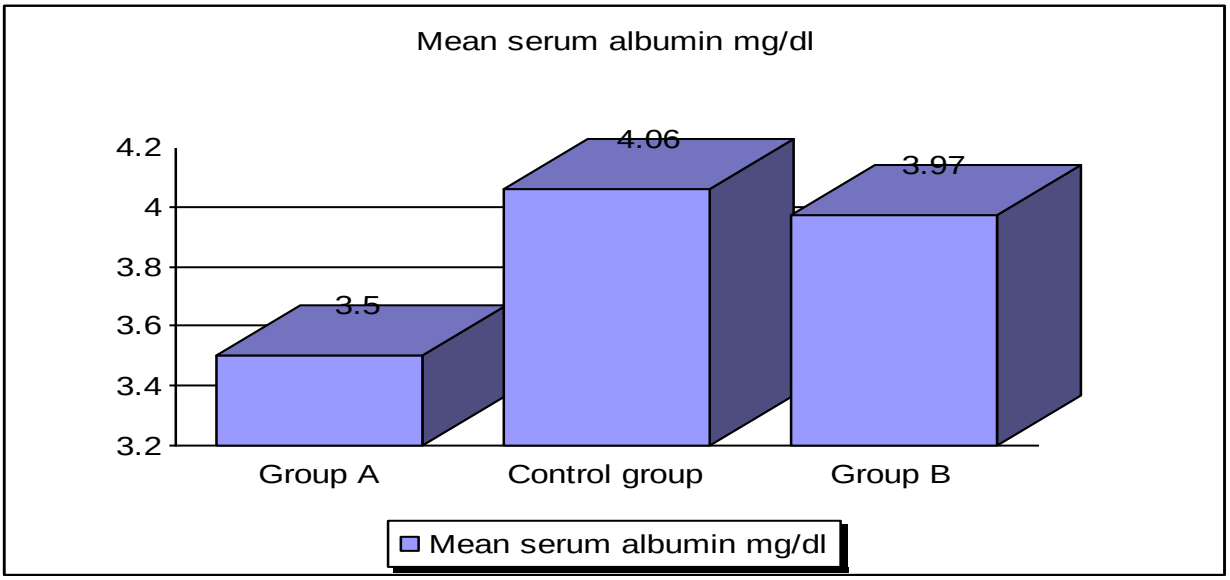

Fig. (46)

Concentration of serum albumin: group (A) patients on hemodialysis, group (B) on conservative treatment and control subjects.

Correlation between serum gastrin and esophageal manometric assay parameters and blood chemistry in both groups of patients.

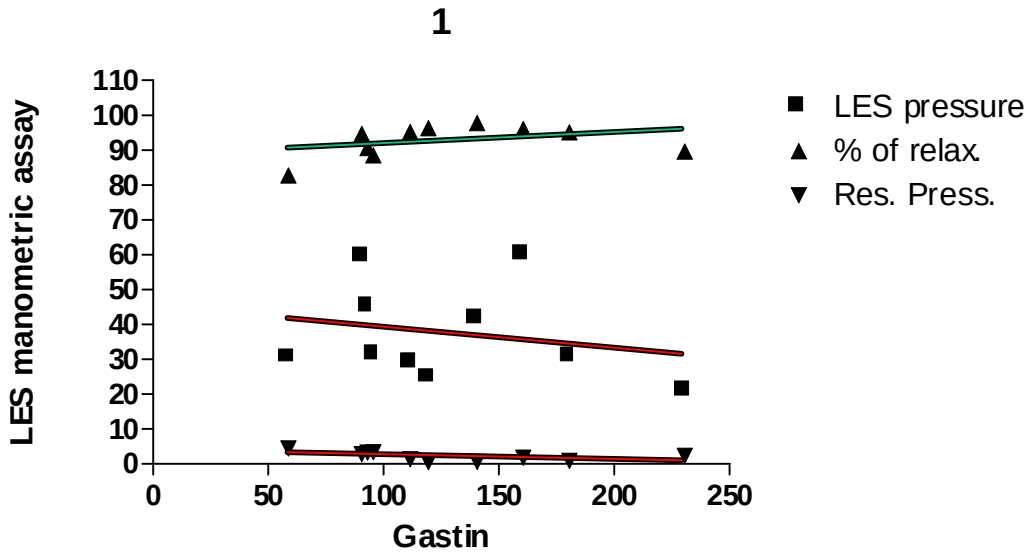

Fig. (47)

No correlation was fond between serum gastrin and LES pressure, percentage of LES relaxation and residual pressure on relaxation in CRF patients (group B) on conservative treatment.

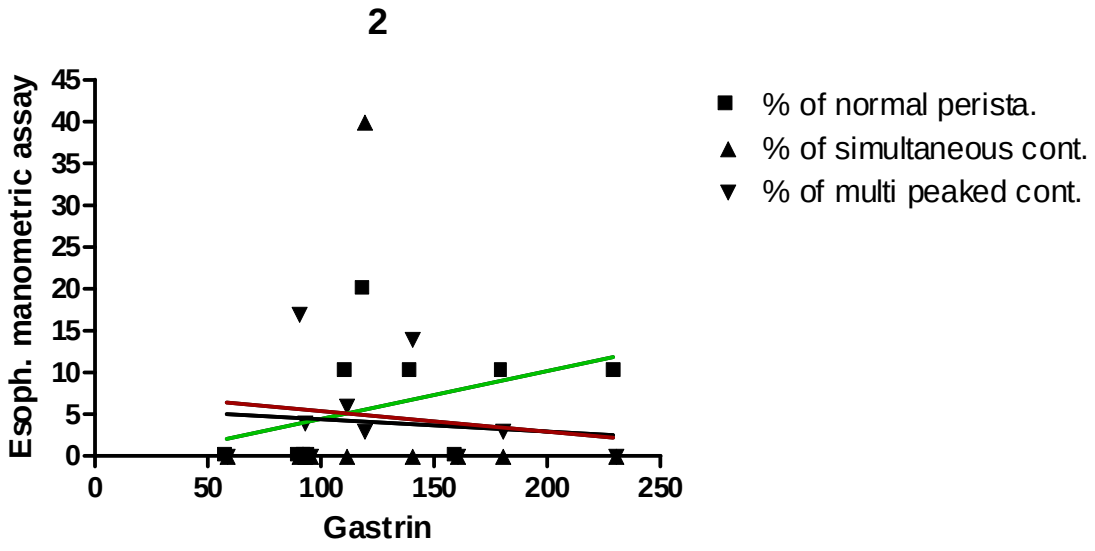

Fig. (48)

No correlation was fond between serum gastrin and percentage of normal esophageal peristalsis, percentage of simultaneous contractions and percentage of multipeaked contractions in CRF patient (group B) on conservative treatment.

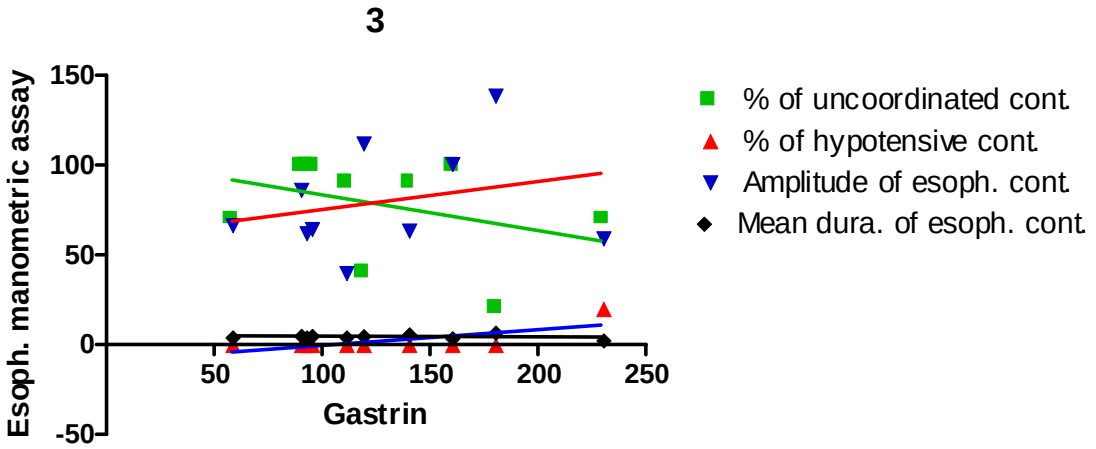

Fig. (49)

No correlation was fond between serum gastrin and percentage of uncoordinated contractions, percentage of hypotensive contractions, amplitude and duration of esophageal contractions in CRF patients (group B) on conservative treatment.

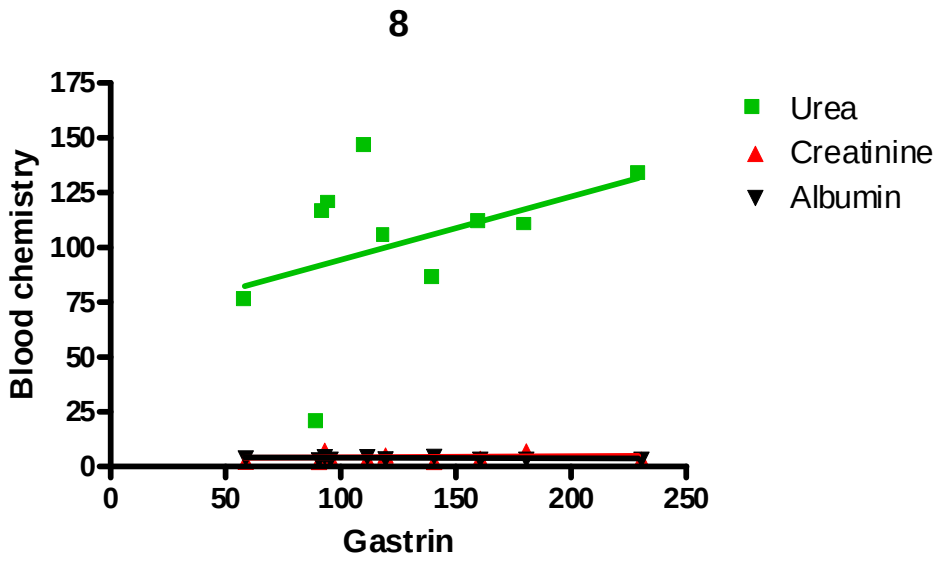

Fig. (50)

No correlation was fond between serum gastrin concentration and serum urea, creatinine, and albumin in CRF patients (group B) on conservative treatment.

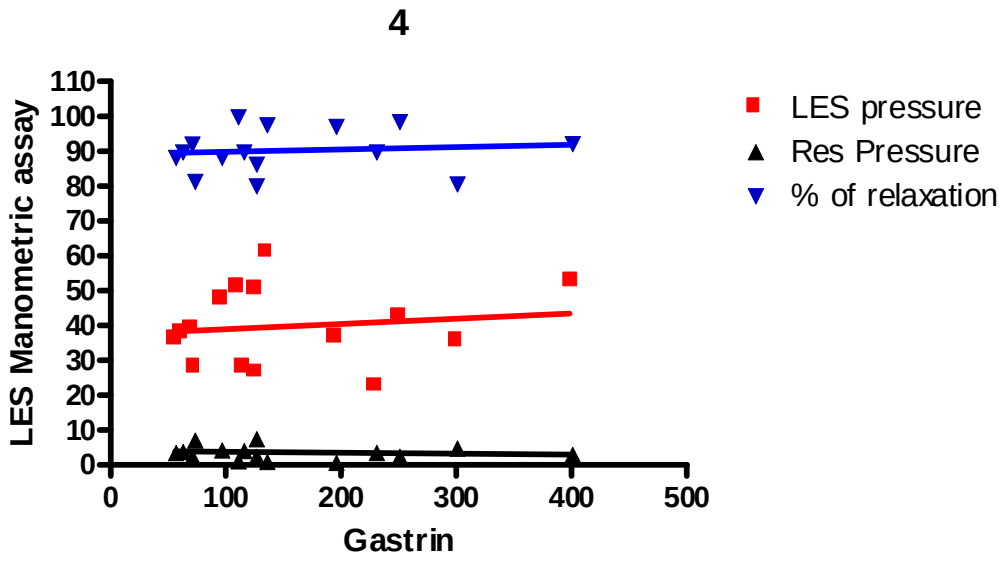

Fig. (51)

No correlation was fond between serum gastrin and LES pressure, percentage of LES relaxation and residual pressure on relaxation in CRF patients (group A) on hemodialysis treatment.

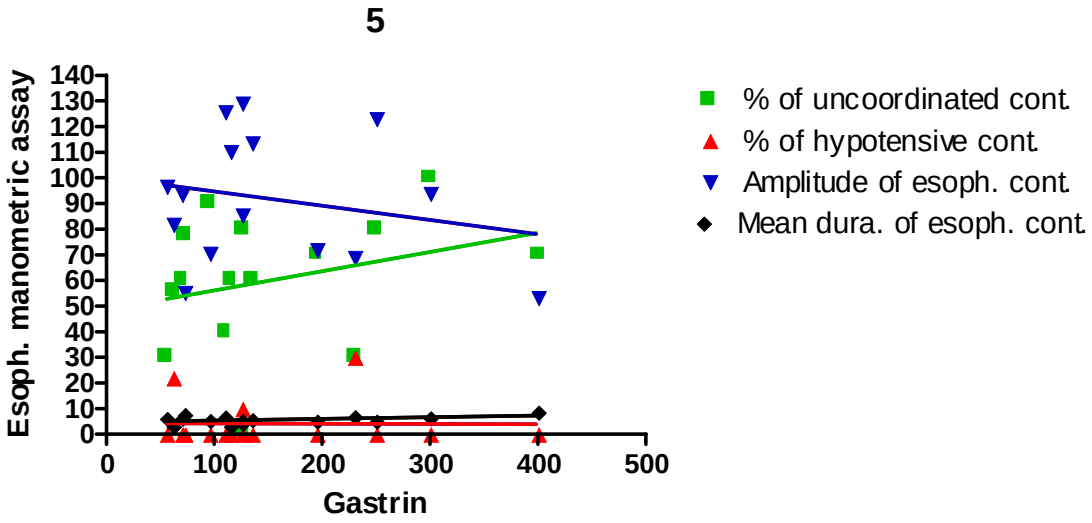

Fig. (52)

No correlation was fond between serum gastrin and percentage of uncoordinated contractions, percentage of hypotensive contractions, amplitude and duration of esophageal contractions in CRF patients (group A) on hemodialysis treatment.

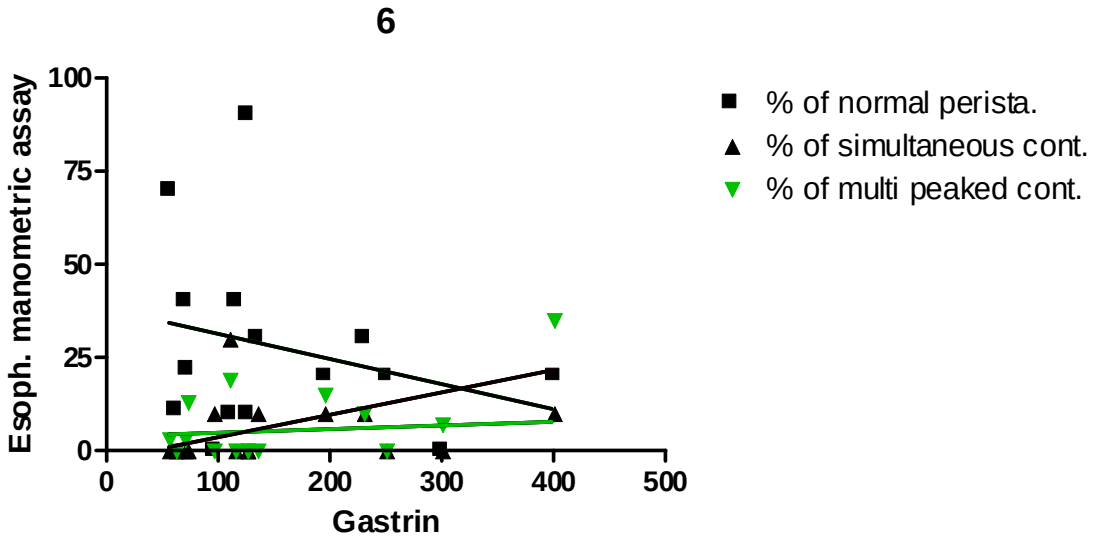

Fig. (53)

No correlation was fond between serum gastrin and percentage of normal esophageal peristalsis, percentage of simultaneous contractions and percentage of multipeaked contractions in CRF patient(groupA) on hemodialysis treatment.

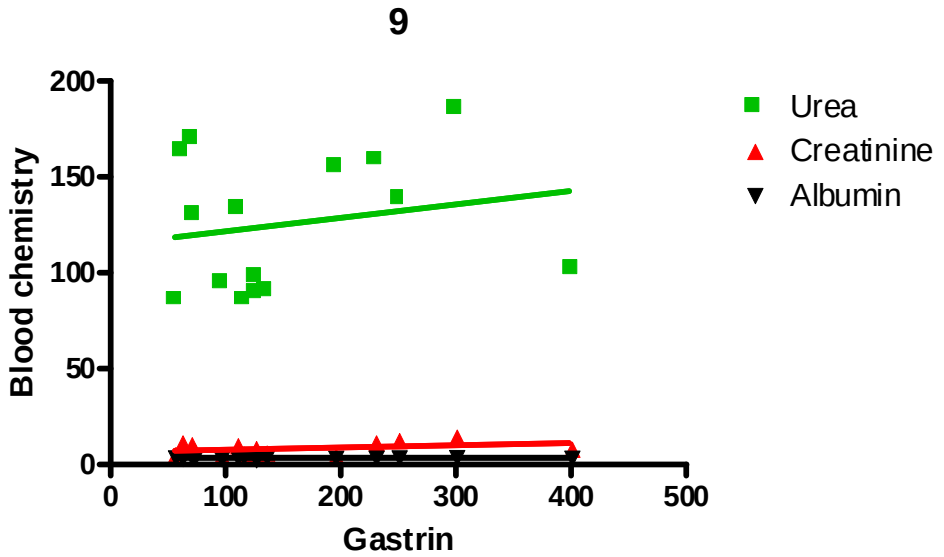

Fig. (54)

No correlation was fond between serum gastrin concentration and serum urea, creatinine, and albumin in CRF patients(group A) on hemodialysis treatment.