Results and analysis

This study comprised 29 cases with acute gastroenteritis. severe dehydration and shock.

Table (1) Show the characters of the Study samples in the form of :

- Sex distribution in which males represent 58.9% of the cases and females represent 41.4% of the study sample.
- Age distribution in which cases below one year represent 79.3% of study sample and cases above one year represent 20.7% of the study sample.
- Mode of feeding in which cases with ABF represent 20.7% and cases mixedly fed represent 79.3% of the study sample .

The gender distribution of the study samples and the age distribution of the study sample were illustrated in figure (1) and figure (2).

Statistical significance of change in biochemical profile was illustrated in **table (2)** as well as in figures 3,4,5 and 6 where the change in the mean of BUN during the days of the study was highly significant.

Table (3) demonstrate the predictivity, sensitivity and specificity of sonographic results in which, normal test referred to cases with sonographic score zero and remained zero to the 4th day (13 cases) Abnormal test was referred to cases (23) with sonographic score either 1, 2 and 3 or cases was taken score zero at first examination and increased to any values in the second examination, four days after. Presence or absence

of disease had been considered according to serum creatinine level above 0.5 mg %.

The negative predictive value of the test was 69.2% (9/13) The +ve predictive value of the test was 31.25% (5/16) The sensitivity of the test was 55.6% (5/9) and the specificity of the test was 45% (9/20).

Figure (7) Show the change in sonographic findings initially and four days after. The number of cases with score zero at admission was 15 cases (51.7%) increased to 23 cases in the fourth day (79.3%) The number of cases with score 1 was eight cases (27.6%) dropped to 3 cases (10,3%) four days after. Number of cases with score 2 or 3 was 6 cases (20.7%) dropped to 3 cases (10.3%) The change in sonographic findings was statistically significant $P < 0001$.

Table (4) and figure (8) show the relation between sonographic findings at day zero and successive mean sodium levels in which cases with sonographic score zero, their mean sodium level was 136.6 meq/l and cases with score 1, their mean sodium level was 142.9 meq/l. and cases with score 2/3, their mean sodium level was 143.8 meq/l. All these changes were not statistically significant.

At day two of sampling the Mean of the sodium level for cases with score zero was 139 meq/l and for cases with score 1 was 138.12 meq/l and for cases with score 2/3 was 142.5 meq/l. These changes were not statistically significant.

At day four of sampling, cases with sonographic zero, their mean of sodium level was 139.7 meq/l and for cases with score 1 was 132.85 meq/l and for cases with score 2/3 it was 137.8 meq/l. these changes were not significant.

Table (5) and figure (9) show the relation between sonographic findings at day zero and successive mean potassium levels, in which cases with sonographic score zero, their mean of potassium level was 3.69 meq/l and cases with score 1, it was 3.25 meq/l and for cases with score 2/3 it was 4.45 meq/l. These changes were not significant.

At day two of sampling, the mean of potassium level for cases with sonographic score zero was 3.67 meq/l and for cases with score one, it was 3.21 meq/l. and for cases with score 2/3 it was 4.23 meq/l These changes were not significant.

At day four of sampling, cases with sonographic score zero their mean of potassium level was 3.97 meq/l. and cases with score 1 it was 3.01 meq/l while for cases with score 2/3, it was 3.90 meq/l. these changes were significant.

Table (6) and figure (10) show the relation between sonographic findings at day zero and successive Mean of BUN levels. Cases with sonographic score zero, their mean of BUN was 30.7 mg % , cases with score one, their mean BUN level was 31.73 mg % and for those with score 2/3 it was 37.56 mg %, these changes were not significant.

At day two of sampling, cases with score zero, their mean BUN level was 26.36 mg% and for cases with score one it was 24.38 mg% and for cases with score 2/3 it was 30.18 mg %. These changes were not significant.

At day four of sampling, cases with score zero, their mean BUN level was 20.55 mg % and for case with score one it was 14.21 mg % and for cases with score 2/3, it was 21.03 mg %. These changes were not significant.

Table (7) and figure (11) show the relation between sonographic findings at day zero and successive means of creatinine levels. for cases with sonographic score zero, their mean of creatinine was 0.86 mg % and for cases with score 1, it was 1.1 mg % and for cases with score 2/3, it was 1.38 mg %. these changes were statistically significant .

At day two of sampling, cases with score zero, their mean creatinine level was 0.86 mg % and for cases with score 1 it was 0.88 mg % and for cases with score 2/3, it was 1.38 mg % these changes were not significant.

At day four of sampling, cases with score zero, their mean creatinine level was. 0.64 mg % and for cases with score one it was 0.53 mg % while for cases with score 2/3, it was 1.48 mg %. These changes were statistically significant.

Table (8) and figure (12) show the relation between sonographic findings at day four and successive mean sodium levels in which cases with sonographic score zero, their mean sodium level

was 137.25 meq/l and cases with score 1, their mean sodium level was 143.8 meq/l and cases with score 2/3, their mean sodium level was 149 meq/l. All these changes were not statistically significant.

At day two of sampling, the Mean of the sodium level for cases with score zero was 138.1 meq/l and for cases with score 1,was 141.3 meq/l and for cases with score 2/3 was 144.6 meq/l. These changes were not statistically significant.

At day four of sampling, cases with sonographic score zero , their mean of sodium level was 138.1 meq/l and for cases with score 1 was 136.2 meq/l and for cases with score 2/3 it was 131.5 meq/l these changes were not significant.

Table (9) figure (13) show the relation between sonographic findings at day four, and successive mean potassium levels, in which cases with sonographic score zero, their mean of potassium level was 3.65 meq/l and cases with score 1, it was 3.76 meq/l and for cases with score 2/3 it was 4.13 meq/l. these changes were not significant.

At day two of sampling, the mean of potassium level for cases with sonographic score zero was 3.6 meq/l and for cases with score one, it was 3.68 meq/l. and for cases with score 2/3 it was 3.63 meq/l. These changes were not significant.

At day four of sampling, cases with sonographic score zero their mean of potassium level was 3.72 meq/l and cases with score 1 it was 3.82 meq/l while for cases with score 2/3, it was 2.75 meq/l. These changes were not significant.

Table (10) and figure (14) show the relation between sonographic findings at day four and successive Mean of BUN levels. cases with sonographic score zero their mean of BUN was 31.84 mg %, cases with score one, their mean BUN level was 27.58 mg % and for those with score 2/3 it was 45.8 mg %, these changes were statistically significant.

At day two of sampling, cases with score zero their mean BUN level was 24.19 mg % and for cases with score one it was 29.77 mg % and for cases with score 2/3 it was 34.96mg %. These changes were not significant.

At day four of sampling, cases with score zero, their mean BUN level was 17.77 mg % and for case with score one it was 16.82 mg % and for cases with score 2/3, it was 31.35 mg %. These changes were not significant.

Table (11) and figure (15) show the relation between sonographic findings at day four and successive means of creatinine levels. for cases with sonographic score zero, their mean of creatinine was 0.93 mg % and for cases with score 1, it was 1.1 mg % and for cases with score 2/3, it was
1.68 mg %. These changes were statistically significant .

At day two of sampling, cases with score zero their mean creatinine level was 0.78 mg % and for cases with score 1 it was 1.2 mg % and for cases with score 2/3, it was 1.7 mg %. These changes were significant.

At day four of sampling, cases with score zero, their mean creatinine level was 0.6 mg % and for cases with score one it was 0.88 mg % while for cases with score 2/3, it was 2.45 mg %. These changes were highly significant statistically .

From page VII to page XI there is a group of sonographic films as an examples of the results obtained on admission and four days after.

Table "1"

Characters of the study sample

Sex	**Males**		**Females**	
	No.	*%*	*No.*	*%*
	17	58.62	12	41.38
Age	**Below one year**		**Above one year**	
	No	*%*	*No.*	*%*
	23	79.3	6	20.7
Mode of feeding	**ABF**		**Mixed Feeding**	
	No.	*%*	*No.*	*%*
	6	20.7	23	79.3

A.B.F. = absolute breast feeding
Mixed feeding = Artificial Feeding ± / or solid foods ± breast feeding

Fig.(1):GENDER DISTRIBUTION OF THE STUDY SAMPLE (N = 29 Cases)

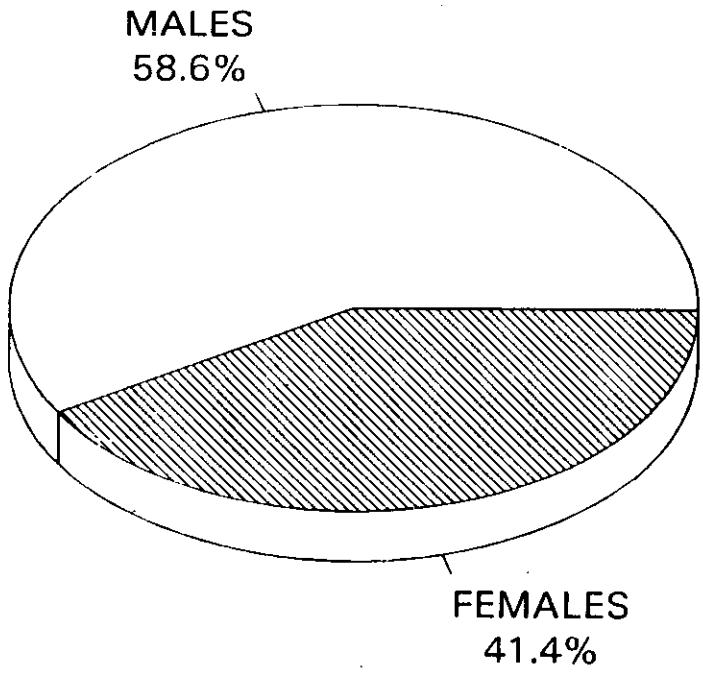


Fig.(2):AGE DISTRIBUTION OF THE STUDY SAMPLE (N = 29 Cases)

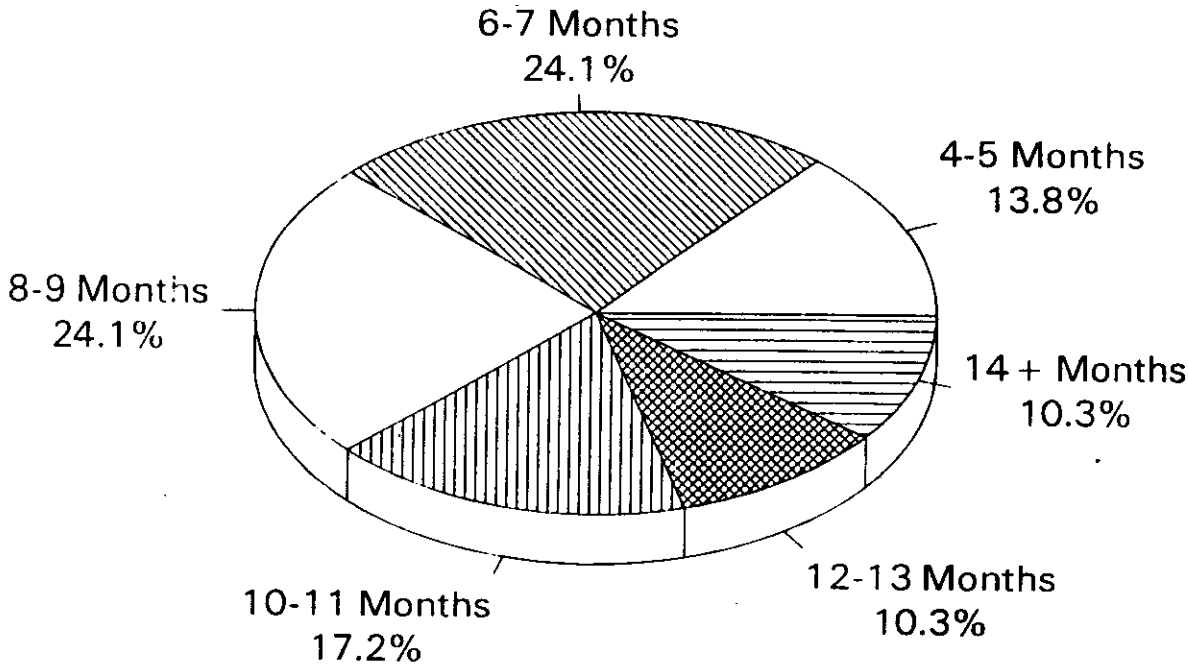
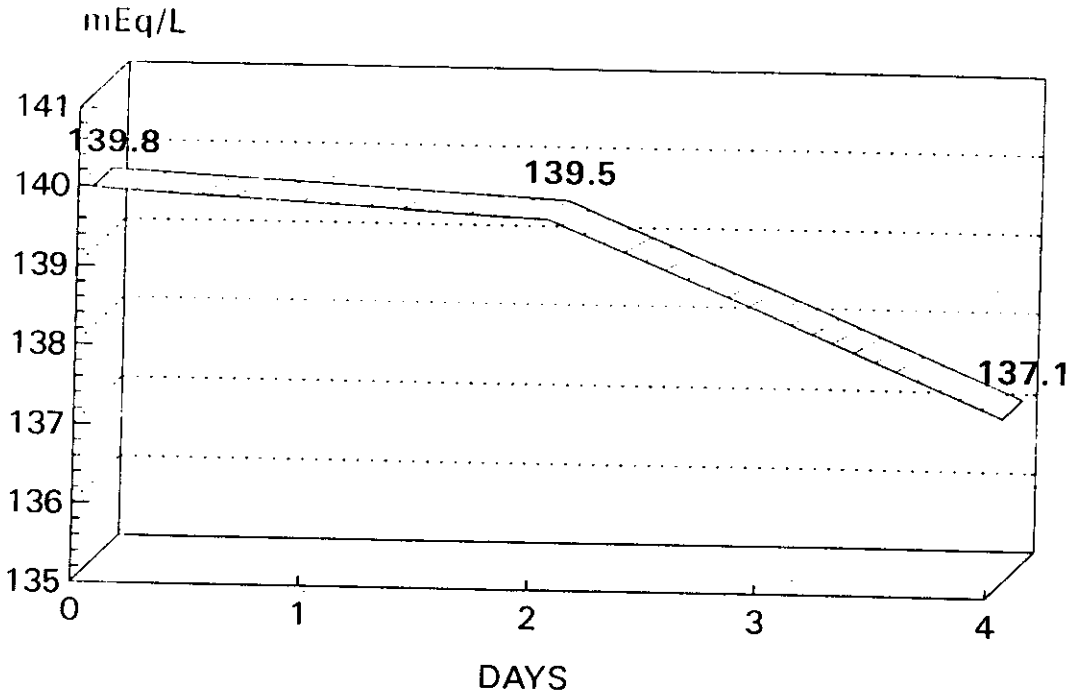
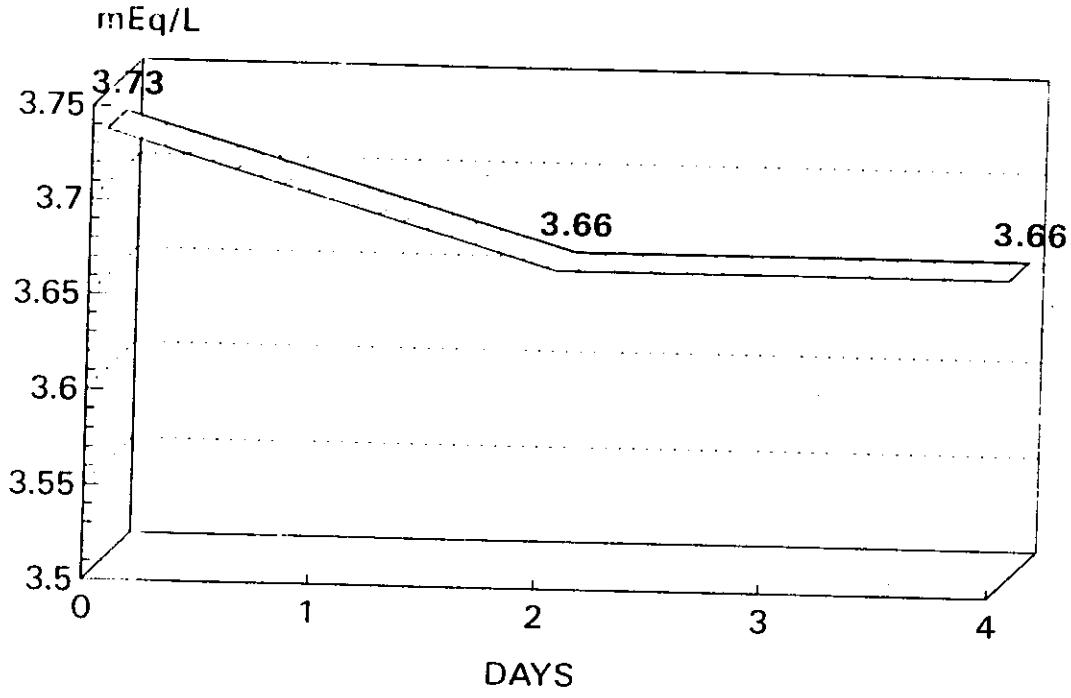


Fig.(3):CHANGE IN MEAN SODIUM LEVEL



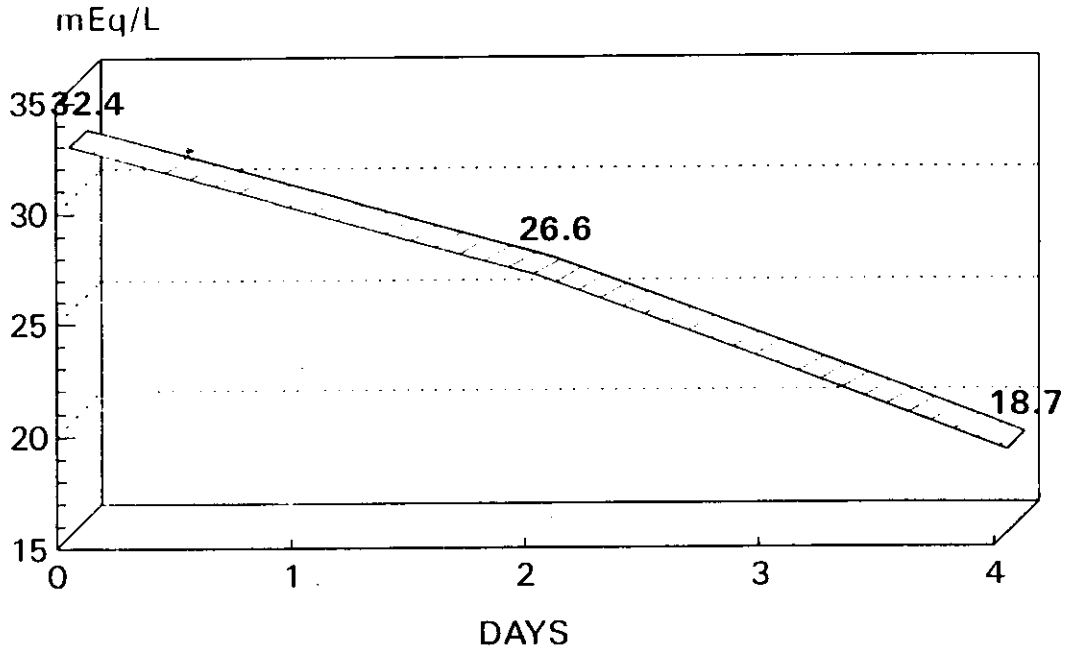
Change is not significant statistically

Fig.(4):CHANGE IN MEAN POTASSIUM LEVEL



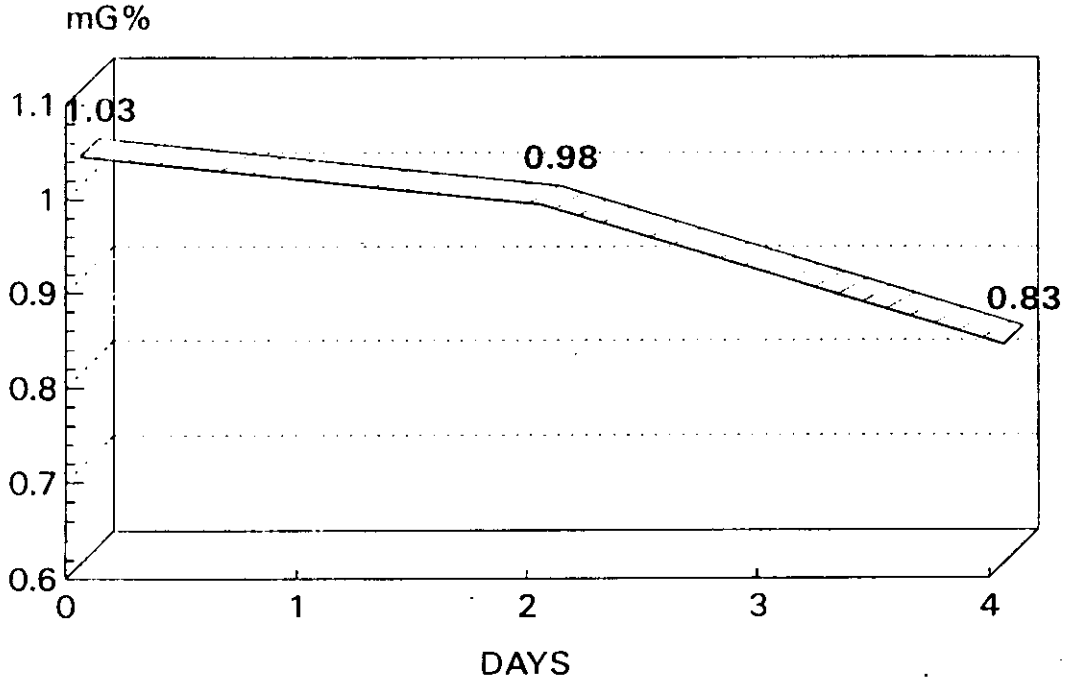
Change is not significant statistically

Fig.(5):CHANGE IN MEAN BUN LEVEL



Change is statistically SIGNIFICANT
$p < .001$

Fig.(6):CHANGE IN MEAN CREATININE LEVEL



Change is not significant statistically

Table "2"
Statistical Significance of Changes in biochemical profile :

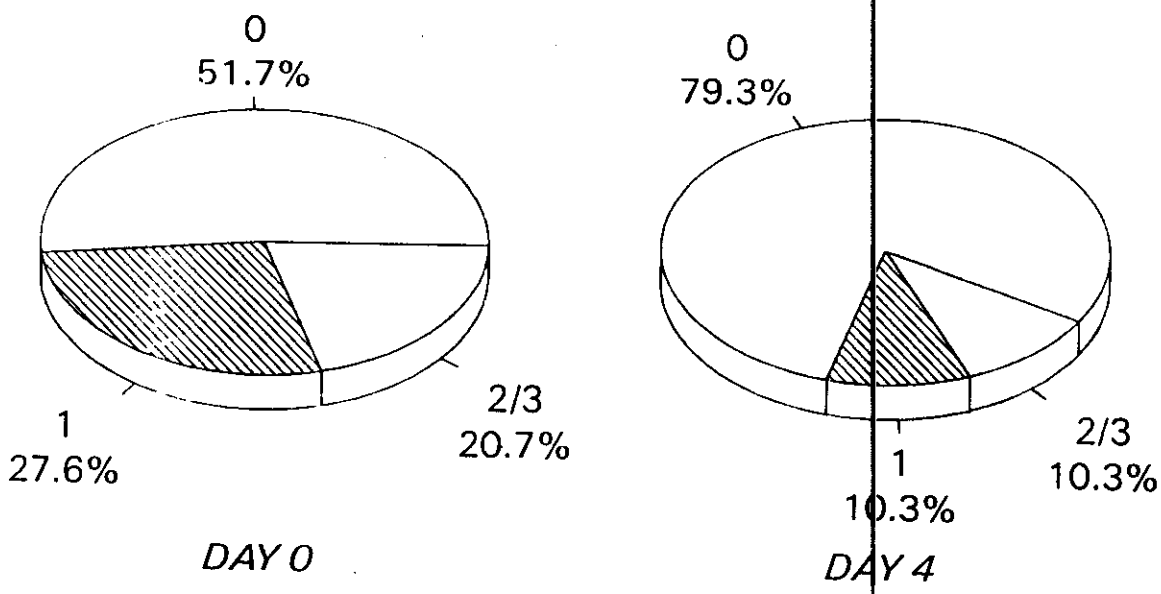
	Statistical Comparison	
	Day 0 / Day 2	Day 0 / Day 4
Sodium T	0.128	0.77
P	0.44	0.22
Potassium T	0.408	0.28
P	0.34	0.38
BUN T	3.03	7.58
P	2.68 (H.S.)	7.118 (H.S)
Creatinine T	0.685	1.403
P	0.249	0.087

H.S. : Highly Significant

Table "3"
Predictivity, sensitvity and specificity of sonographic data

Presence or Absence / Test / disease	Disease present	Disease Absent	% of Predictivity
Normal test	4	9	9/13=69.2%
Abnormal test	5	11	5/16=31.25%
% of Sensitvity and Specificity	5/9=55.6%	9/20=45.0%	**100%**

Fig.(7):SONOGRAPHIC FINDINGS: INITIAL AND DAY 4



Total number = 29 Cases
Difference statistically significant
$p < .0001$

Fig.(8):RELATION BETWEEN SONOGRAPHIC FINDINGS AT DAY 0 AND SUCESSIVE SODIUM LEVELS

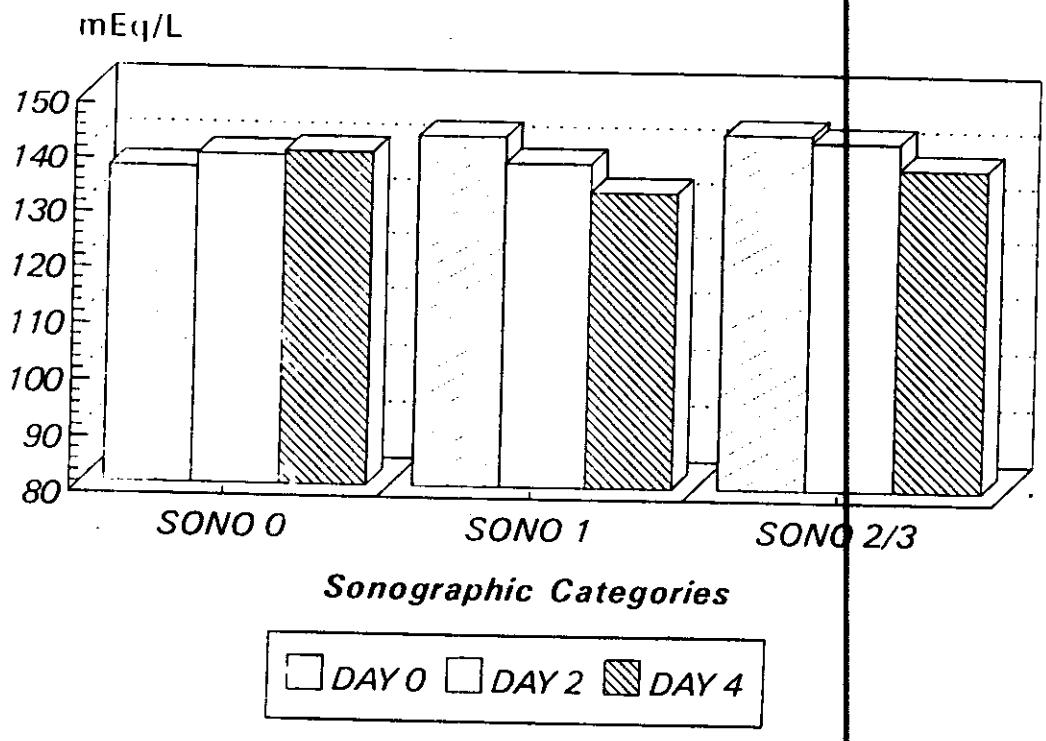


Fig.(9):RELATION BETWEEN SONOGRAPHIC FINDINGS AT DAY 0 AND SUCESSIVE POTASSIUM LEVELS

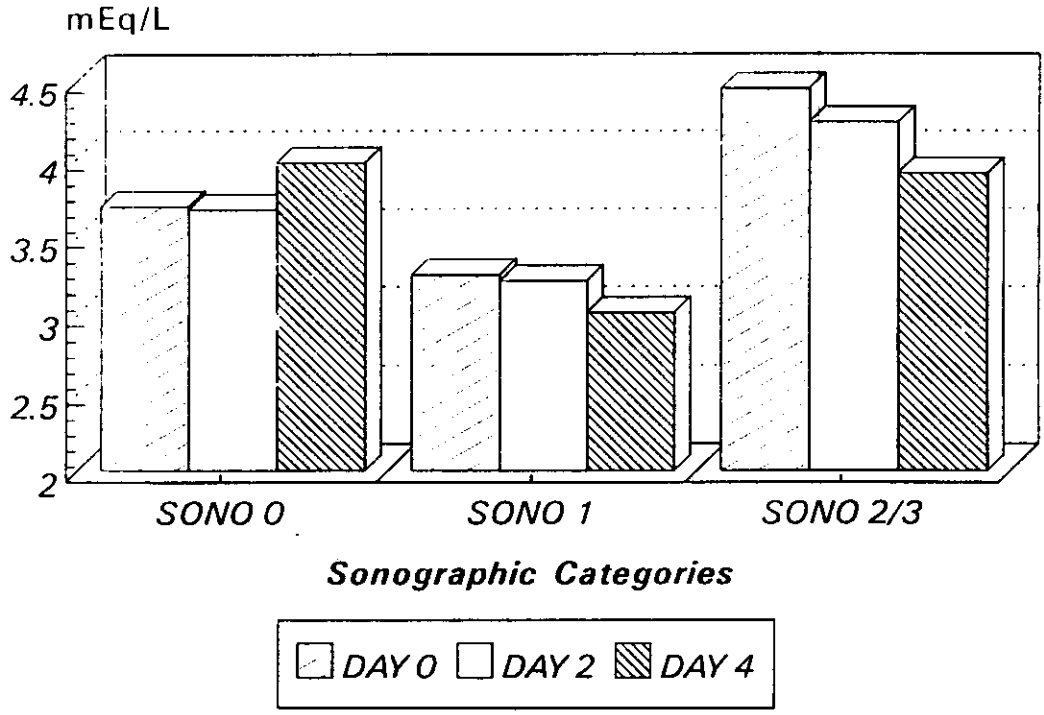


Fig.(10):RELATION BETWEEN SONOGRAPHIC FINDINGS AT DAY 0 AND SUCESSIVE BUN LEVELS

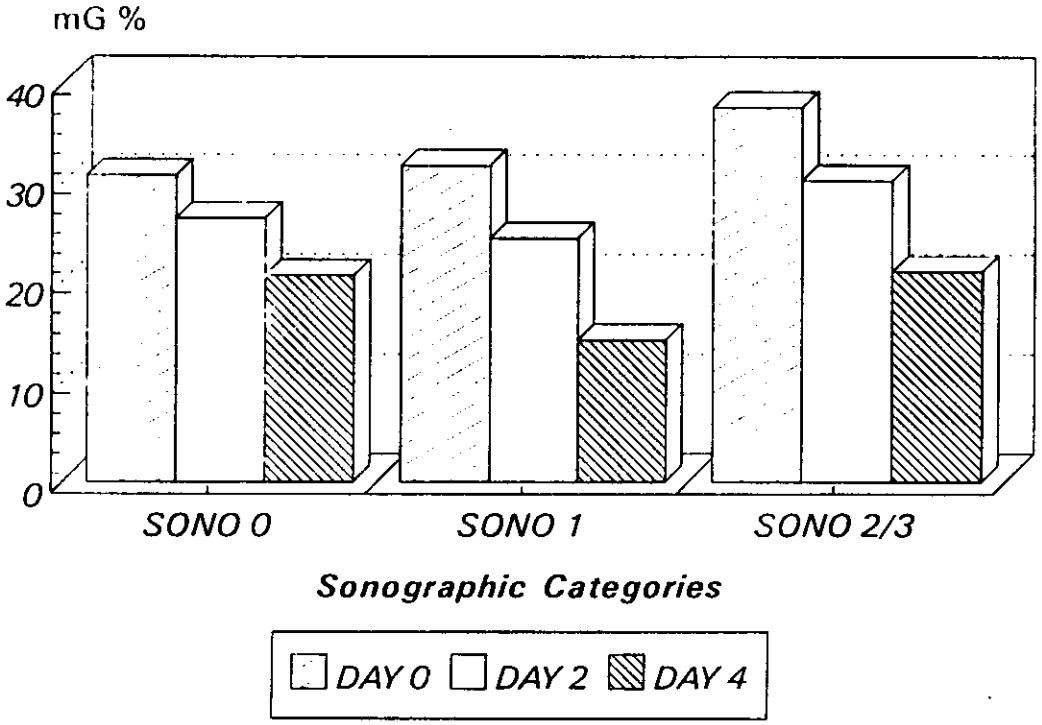


Table "4"
Relation Between Sonographic Findings at Day 0 and Successive Sodium Levels

Sonographic code	Day 0	Day 2	Day 4
0	136.6	139	139.7
1	142.9	138.12	132.85
2/3	143.8	142.5	137.83
Signifiance F	0.87	0.203	0.651
P	0.43	0.81	0.53

Table "5"
Relation Between Sonographic Findings at Day 0 and Successive Potassium Levels

Sonographic code	Day 0	Day 2	Day 4
0	3.69	3.67	3.97
1	3.25	3.21	3.01
2/3	4.45	4.23	3.90
Significance F	1.825	1.981	3.703
P	0.1812	0.1591	0.0428 Significant

Table "6"
Relation Between Sonographic Findings at Day 0 and Successive BUN Levels

Sonographic code	Day 0	Day 2	Day 4
0	30.7	26.36	20.55
1	31.73	24.38	14.21
2/3	37.56	30.18	21.03
Significant F	0.85	0.407	0.75
p	0.439	0.670	0.485

Table "7"
Relation Between Sonographic Findings at Day 0 and Successive Creatinine Levels

Sonographic code	Day 0	Day 2	Day 4
0	0.86	0.86	0.64
1	1.10	0.88	0.53
2/3	1.38	1.38	1.48
Significant F	3.65	1.84	5.30
P	0.039 (Sig)	0.179	0.014 (Sig).

Fig.(11):RELATION BETWEEN SONOGRAPHIC FINDINGS AT DAY 0 AND SUCESSIVE CREATININE LEVELS

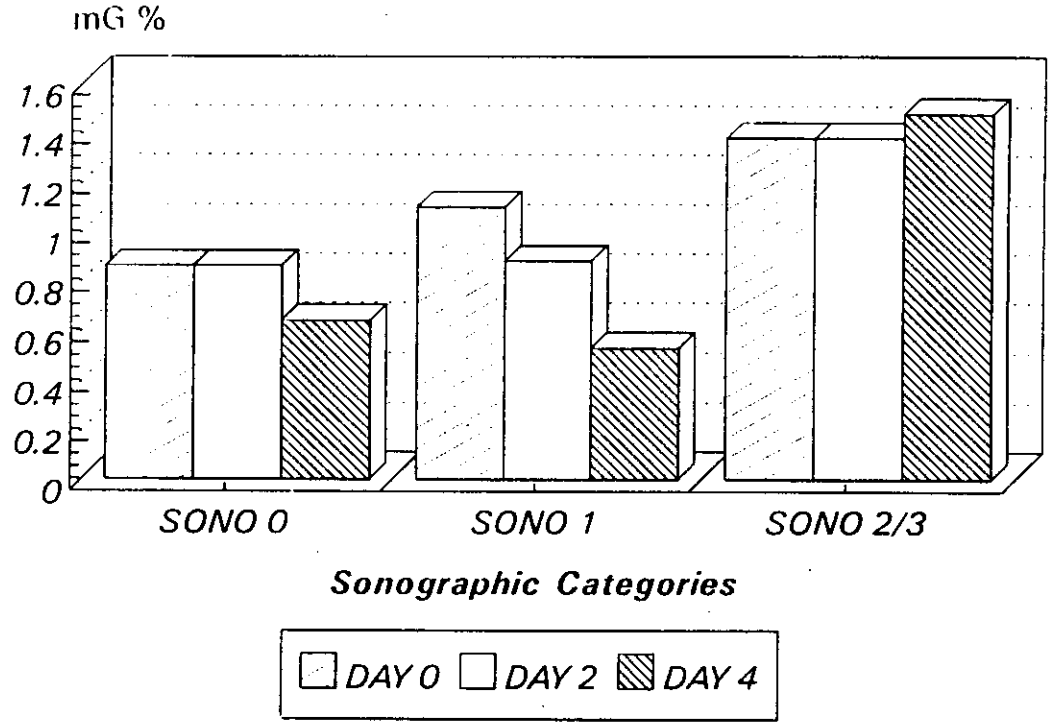


Fig.(12):RELATION BETWEEN SONOGRAPHIC FINDINGS AT DAY 4 AND SUCCESSIVE SODIUM LEVELS

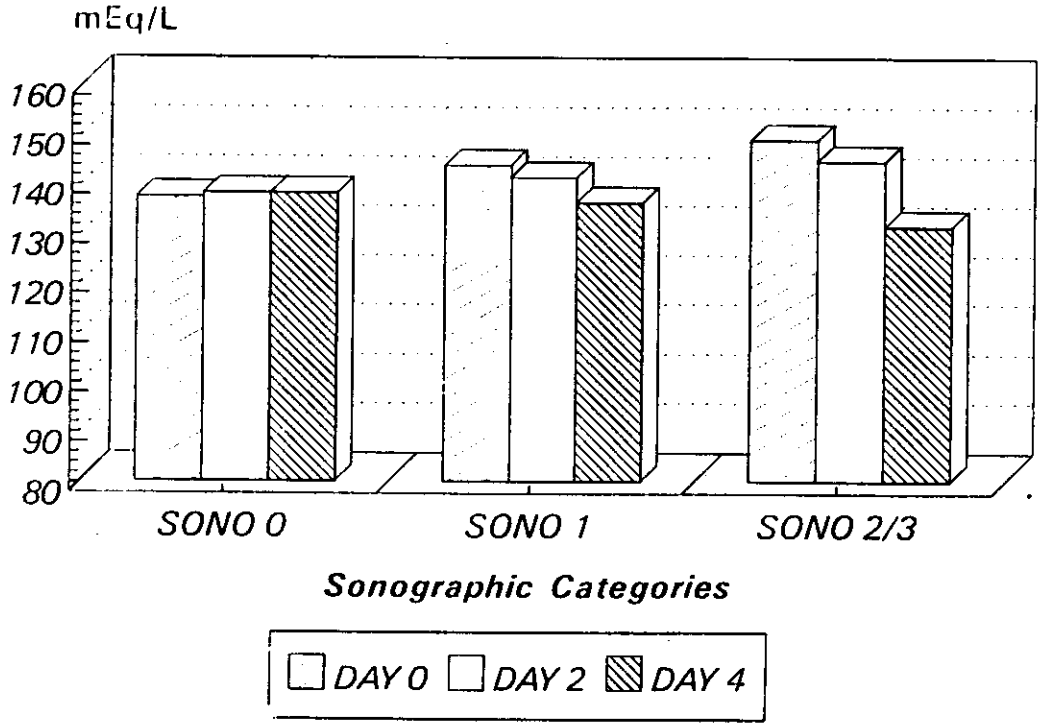


Table "8"
Relation Between Sonographic Findings at Day 4 and Successive Sodium Levels

Sonographic code	Day 0	Day 2	Day 4
0	137.25	138.1	138.12
1	143.83	141.33	136.2
2/3	149.0	144.66	131.5
Signifionce F	1.32	0.389	0.266
P	0.283	0.681	0.768

Table "9"
Relation Between Sonographic Findings at Day 4 and Successive Potassium Levels

Sonographic code	Day 0	Day 2	Day 4
0	3.65	3.60	3.72
1	3.76	3.68	3.82
2/3	4.13	3.63	2.75
Significan F	0.199	0.158	1.34
P	0.821	0.85	0.283

Table "10"
Relation Between Sonographic Findings at Day 4 and Successive BUN Levels

Sonographic code		Day 0	Day 2	Day 4
0		31.84	24.19	17.77
1		27.58	29.77	16.82
2/3		45.80	34.96	31.35
Significant	F	3.30	1.41	1.33
	P	0.052 (sig)	0.263	0.285

Table "11"
Relation Between Sonographic Findings at Day 4 and Successive Creatinine Levels

Sonographic code		Day 0	Day 2	Day 4
0		0.93	0.78	0.60
1		1.1	1.2	0.88
2/3		1.6	1.7	2.45
Significant	F	3.59	4.85	14.43
	P	0.042	0.017	.323 E-04
		(Sig.)	(sig.)	(high significant)

Fig.(13):RELATION BETWEEN SONOGRAPHIC FINDINGS AT DAY 4 AND SUCCESSIVE POTASSIUM LEVELS

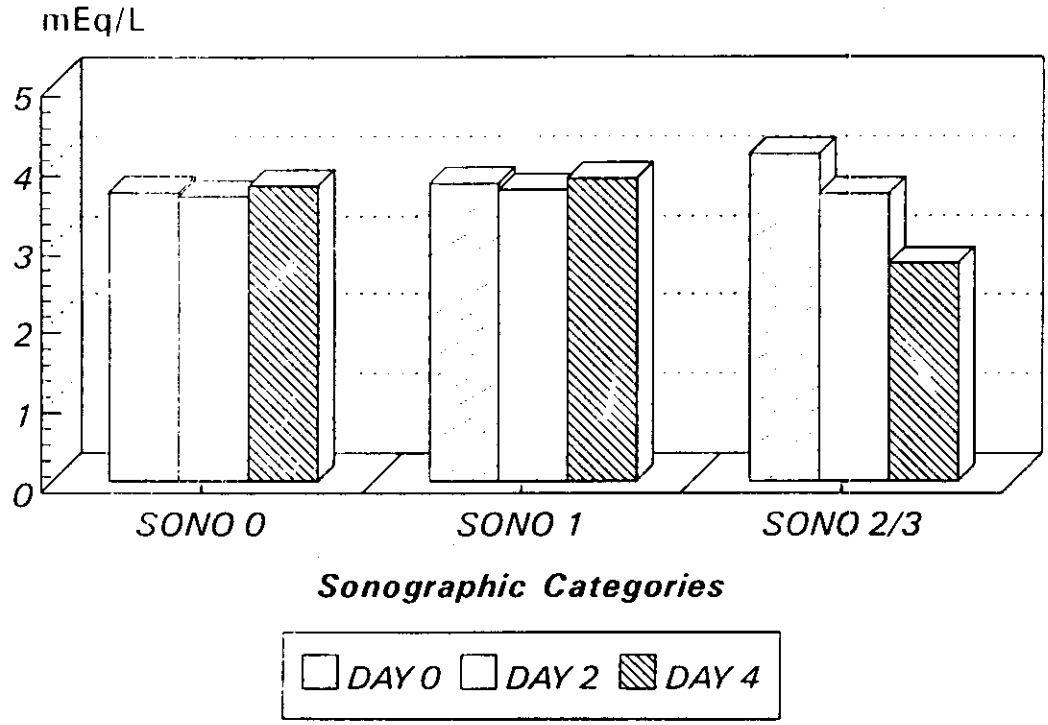


Fig.(14):RELATION BETWEEN SONOGRAPHIC FINDINGS AT DAY 4 AND SUCCESSIVE BUN LEVELS

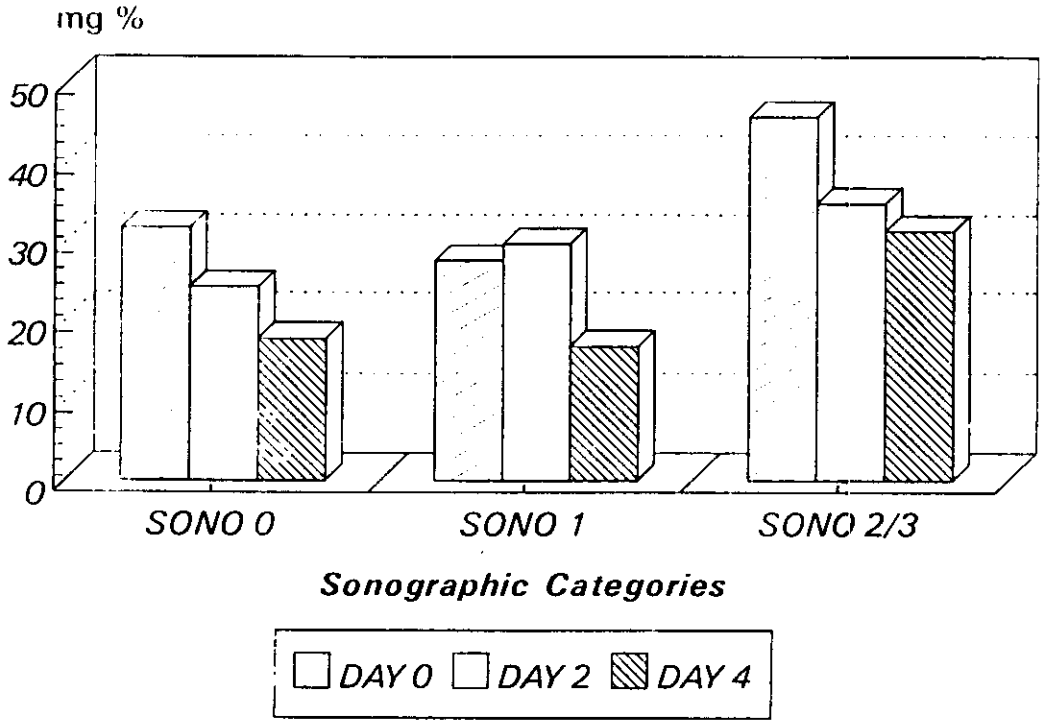
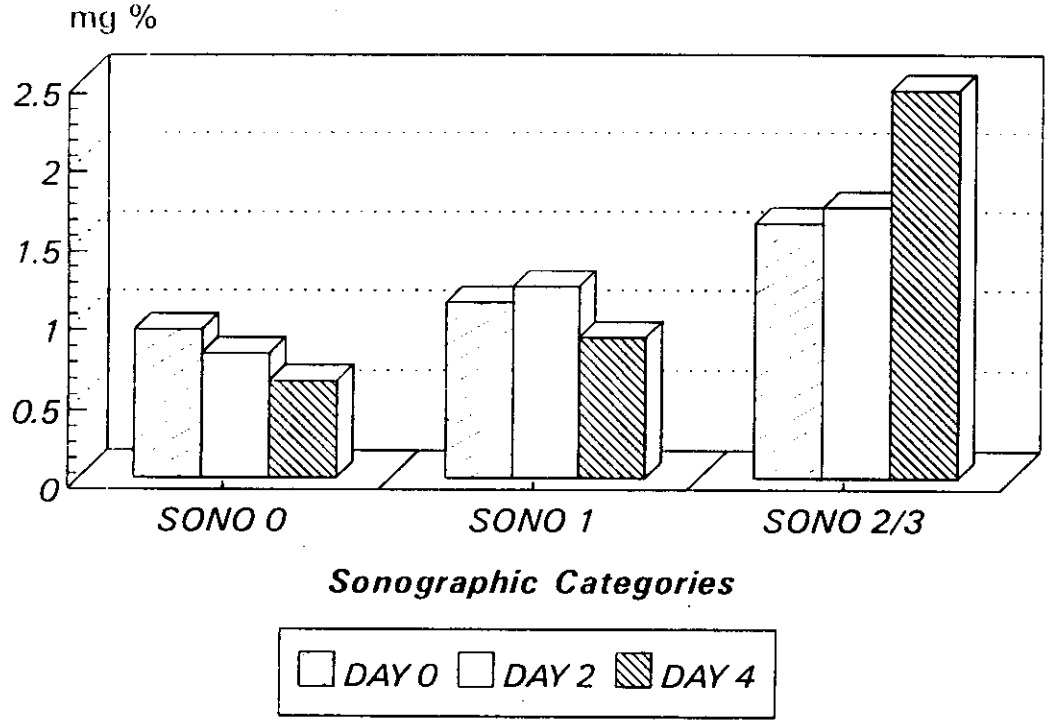
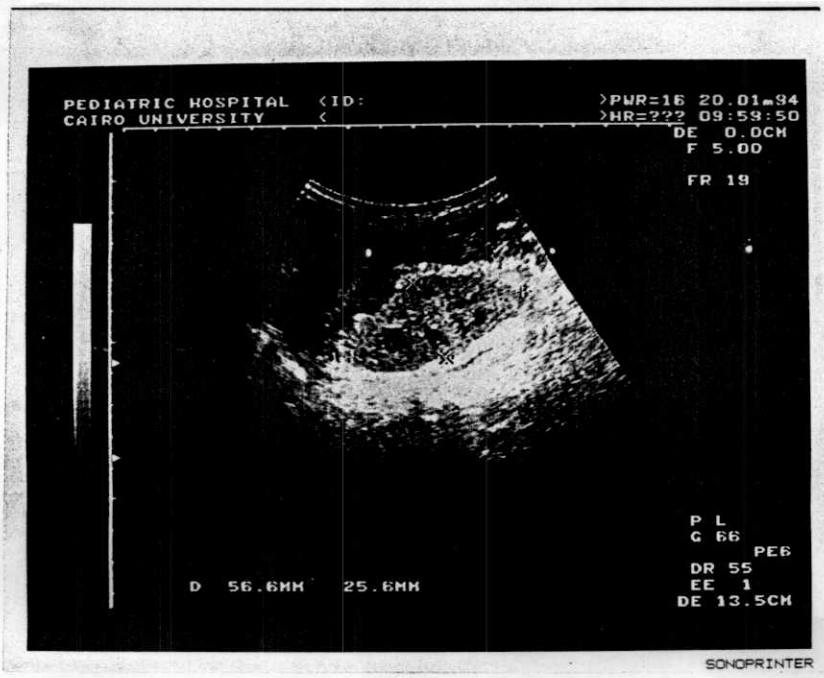


Fig.(15):RELATION BETWEEN SONOGRAPHIC FINDINGS AT DAY 4 AND SUCCESSIVE CREATININE LEVELS

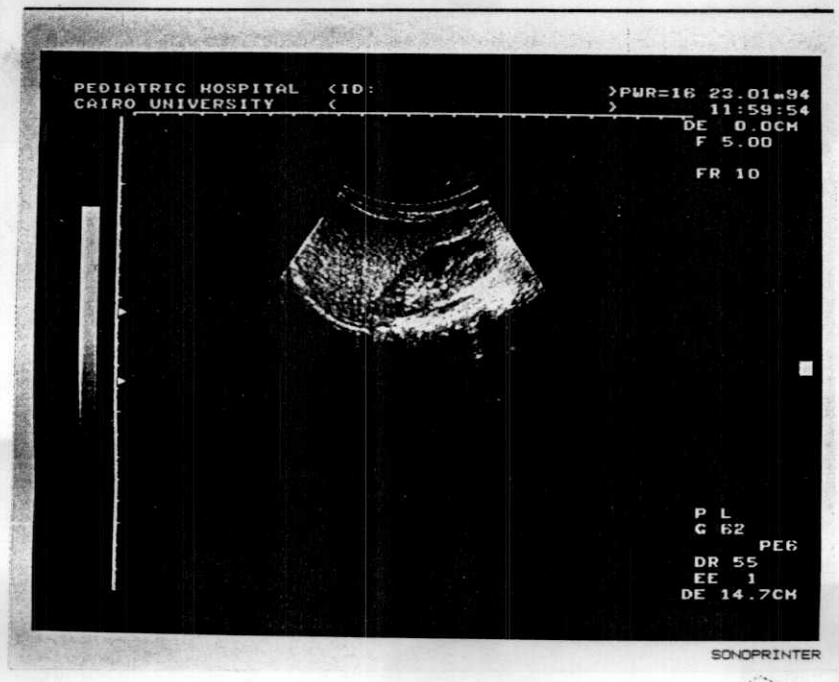




Sono Zero

- Echogenic Parenchyma

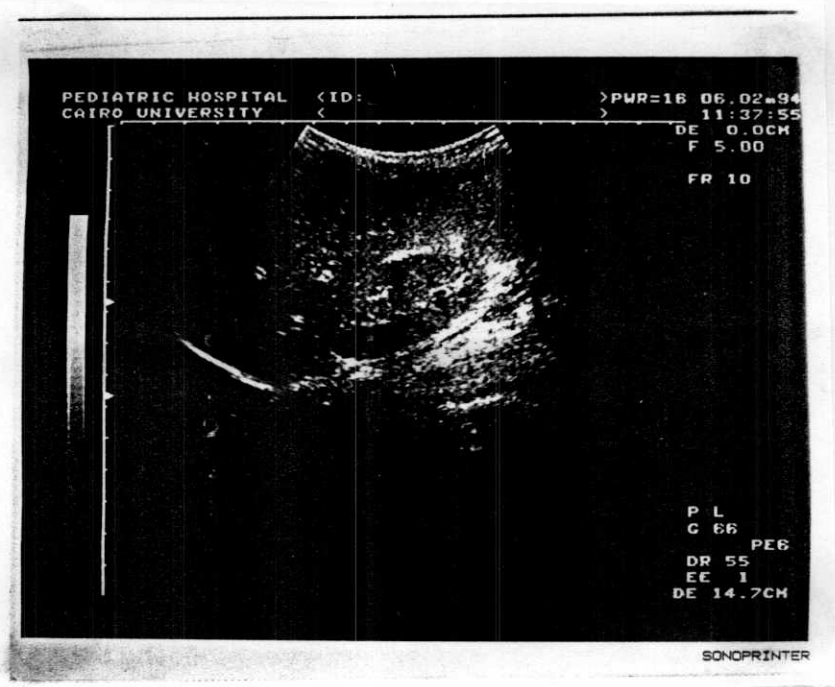
- Prominent Pyramids



Sono Four

- Normal Echogenicity

- Normal Pyramidal Prominence

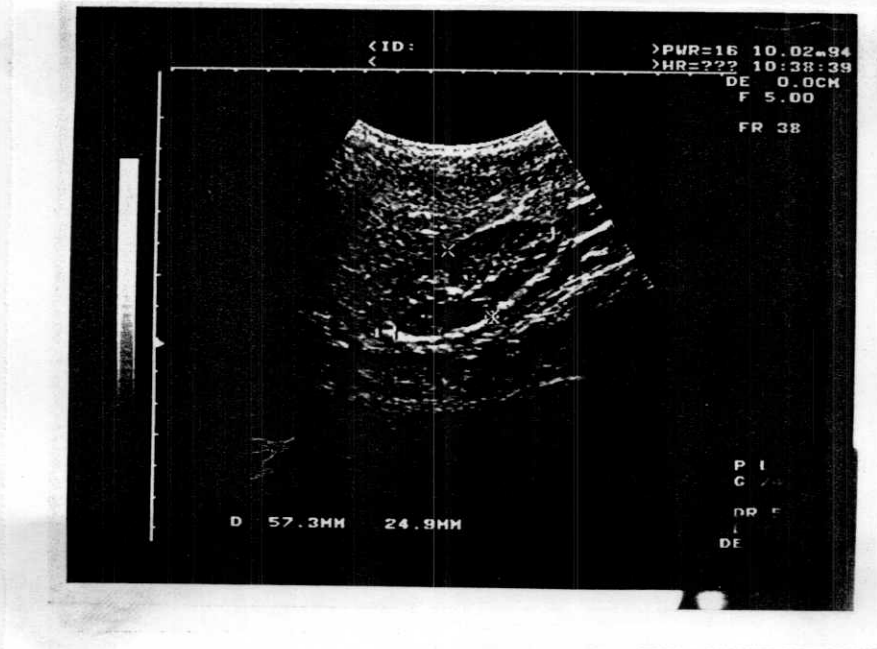


Sono Zero

- Normal Size

- Increased Parenchymal echogenicity

- Increased Pyramidal Prominence

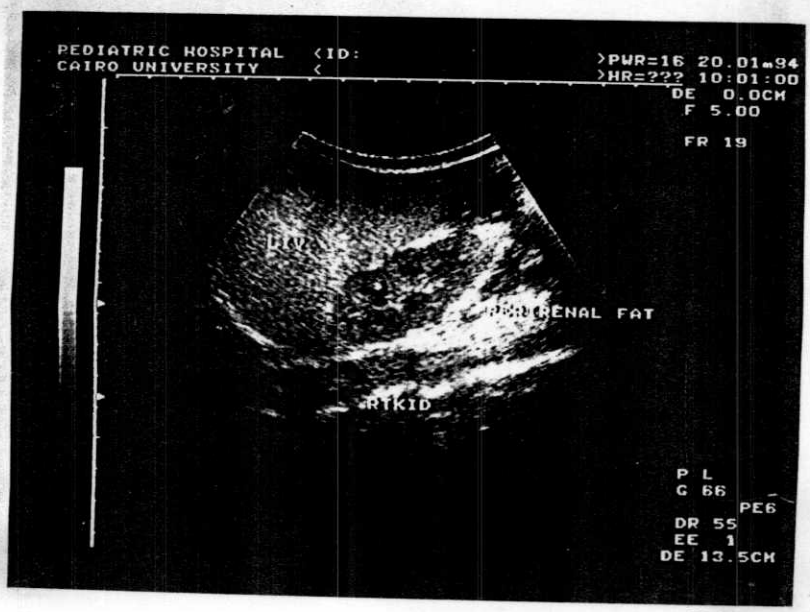


Sono Four

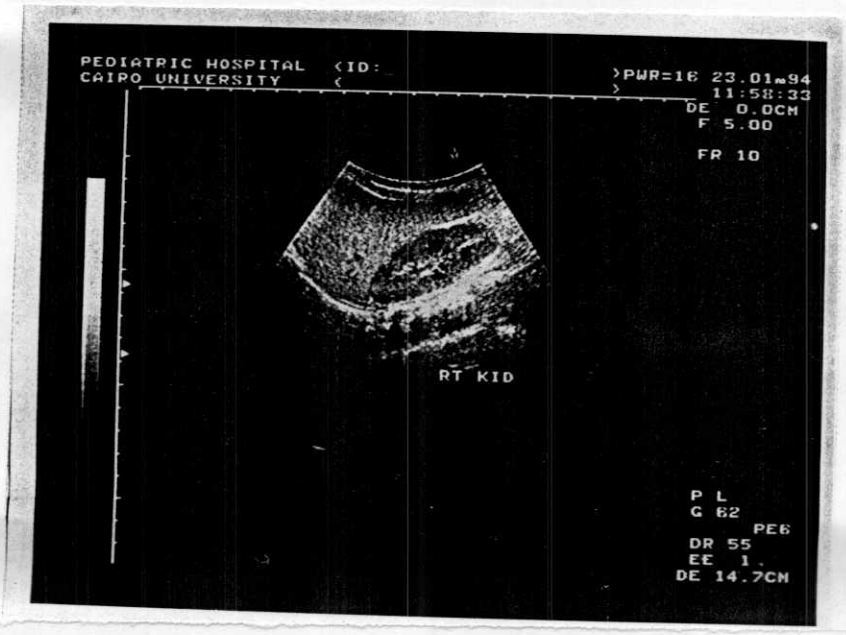
- Normal Size

- Normal Echogenicity

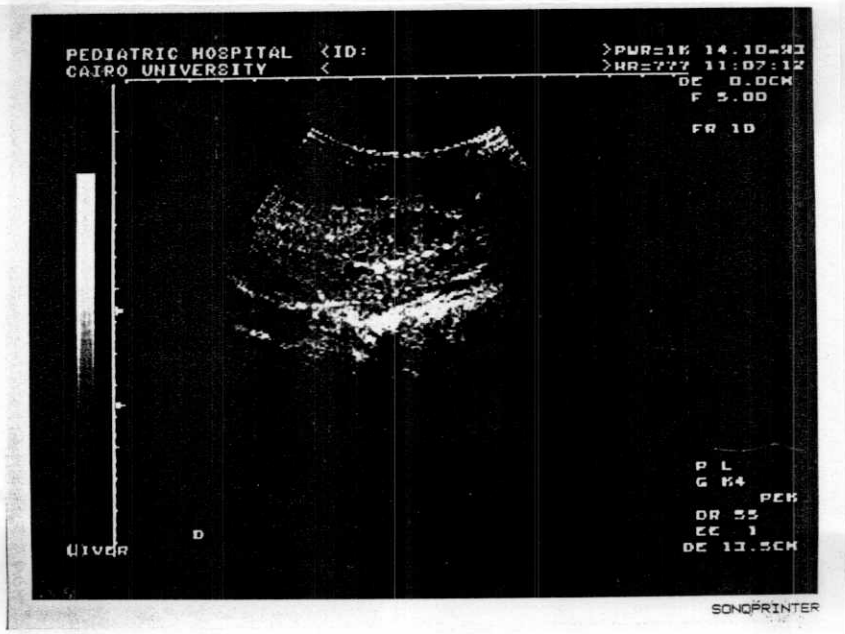
- Normal Pyramidal prominence



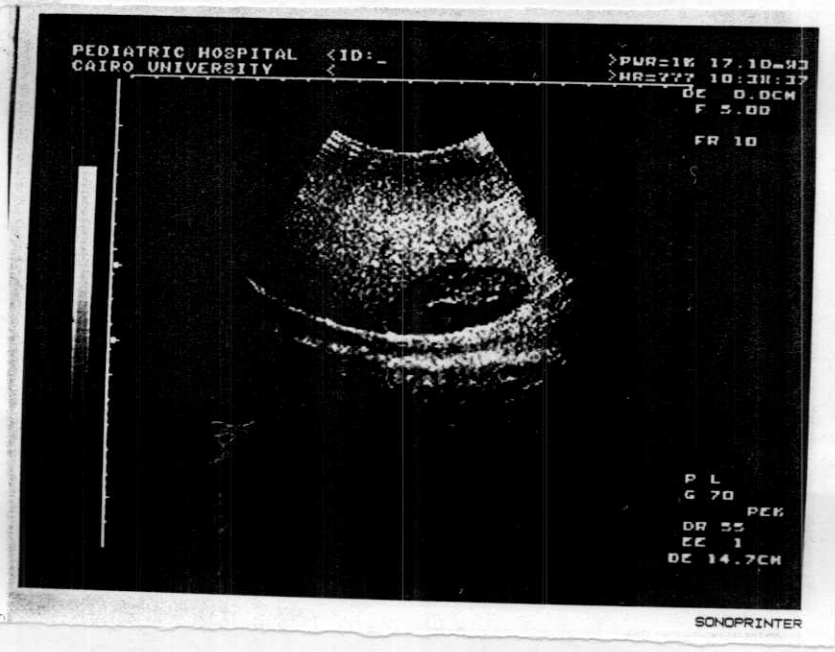
Sono Zero
- Normal Size
- Normal echogenicity
- Normal Pyramidal prominence



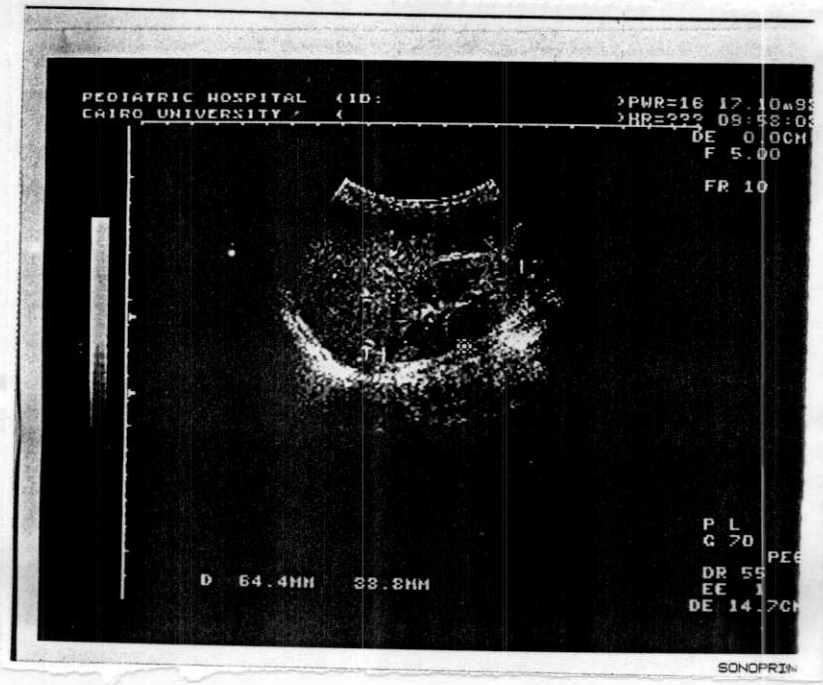
Sono Four
- Normal Size
- Normal echogenicity
- Normal Pyramidal prominence



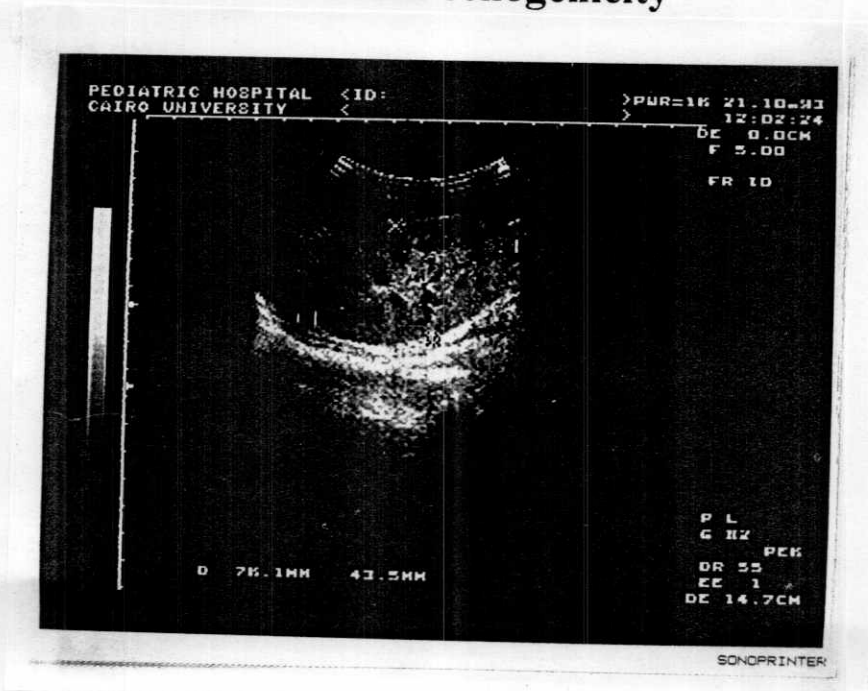
Sono Zero
- Normal Size
- Increased echogenicity
- Increased Pyramidal Prominence



Sono Four
- Normal Size
- Normal echogenicity
- Normal Pyramidal prominence



Sono Zero
- Normal Size
- Normal echogenicity



Sono Four
- Increased Size
- Increased echogenicity
- Prominent Pyramids