STATISTICAL ANALYSIS

STATISTICAL ANALYSIS OF THE RESULTS

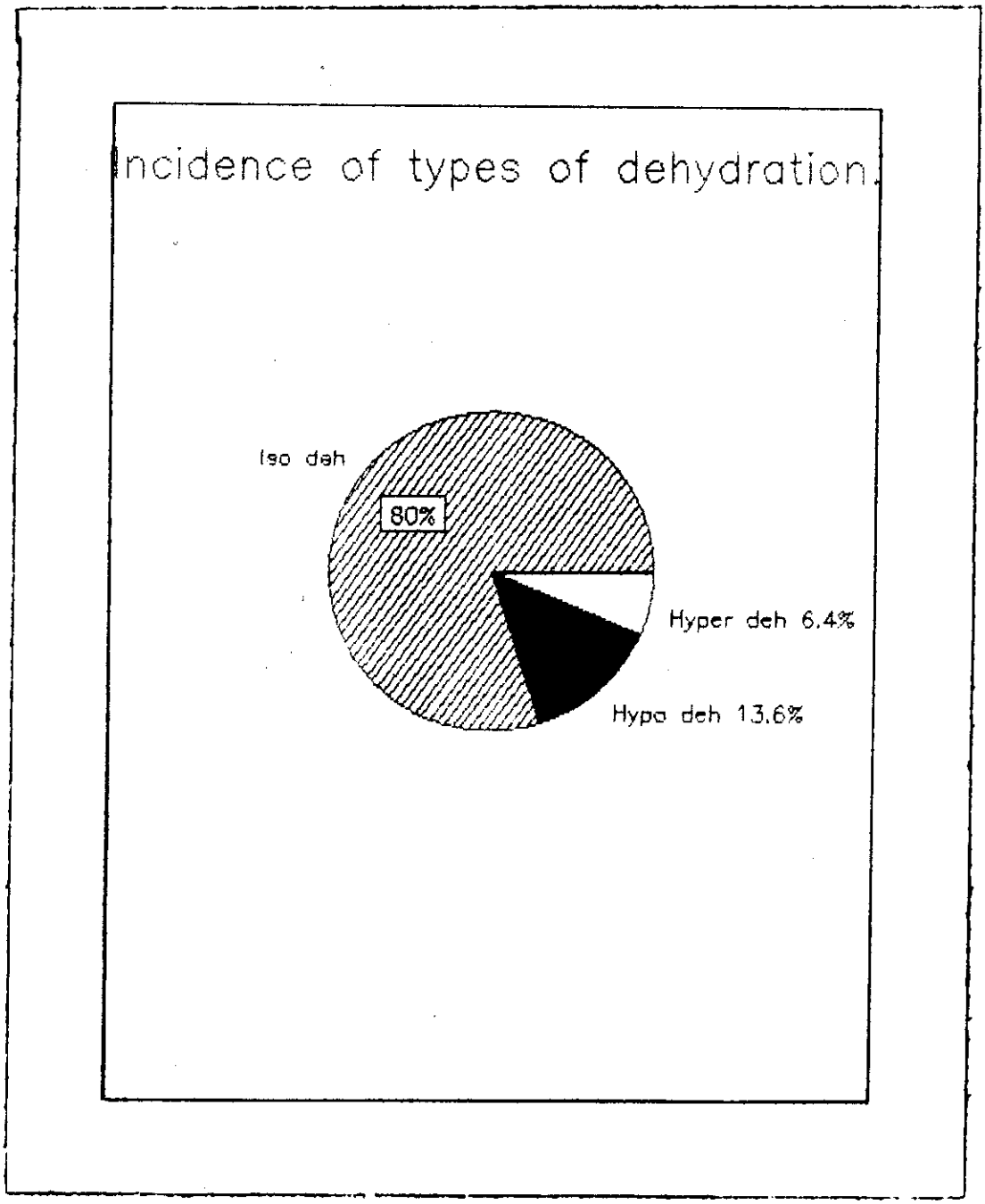
In this study a number of data are not statistically significant (i.e P>0.05). This is explained by the fact that hypernatremic dehydration is a multifactorial phenomenon, i.e when we study the effect of one factor we can not exclude the effect of the other factors.

1- INCIDENCE OF ALL TYPES OF DEHYDRATION

	Iso.deh.	Hypo.deh.	Hyper.deh.	Total
Number	200	34	16	250
Percent	80%	13.6%	6.4%	100%

* Incidence of Isonatremic dehydration is 80%
* Incidence of hyponatremic dehydration is 13.6%
* Incidence of hypernatremic dehydration is 6.4%

Figure 11


Incidence of types of dehydration.
Iso deh
80%
Hyper deh 6.4%
Hypo deh 13.6%

2- RELATION OF HYPERNATREMIA WITH AGE OF PATIENT

	Number	Mean X on month	stand.dev. S.D. versus Iso.	T-value	P.value
Iso.d.	200	10.76	5.25		
Hypon.d.	34	11	6.11	0.17	>0.05
Hyper.d.	16	8.69	4.38	1.41	>0.05

* T.value is calculated versus isonatremic dehydration.
* Mean value of age in months.
* Mean age for isonatremic dehydration is 10.76 months
* Mean value of hyponatremic dehydration is 11 months
* Mean value of hyernatremic dehydration is 8.69 months.

3- INCIDENCE OF TYPES OF DEHYDRATION ACCORDING TO AGE GROUPS

Age group	Iso.deh.		Hypon.deh.		Hyper.deh.		Total	
	No.	Per.	No.	Per.	No.	Per.	No.	Per.
<6	28	14%	5	14.7%	2	12.5%	35	14%
6-12	92	46%	13	38.2%	9	56.25%	114	45.6%
12-18	48	24%	9	26.5%	4	25%	61	24.4%
18-24	32	16%	7	20.6%	1	6.25%	40	16%
total	200	100%	34	100%	16	100%	250	100%

* Chi^2 =2.32
* df =6
* P >0.05

* 12.5% of the hypernatremic infants are below age of 6 months
* 56.25% of the hypernatremic infants lies in age group from 6 to below 12 months
* 25% of the hypernatremic infants lies in age group from 12 to 18 months
* 6.25% of the hypernatremic infants lies in age group from 18 to 24 months.
* 67.75% of the hypernatremic infants wee below 12 months.

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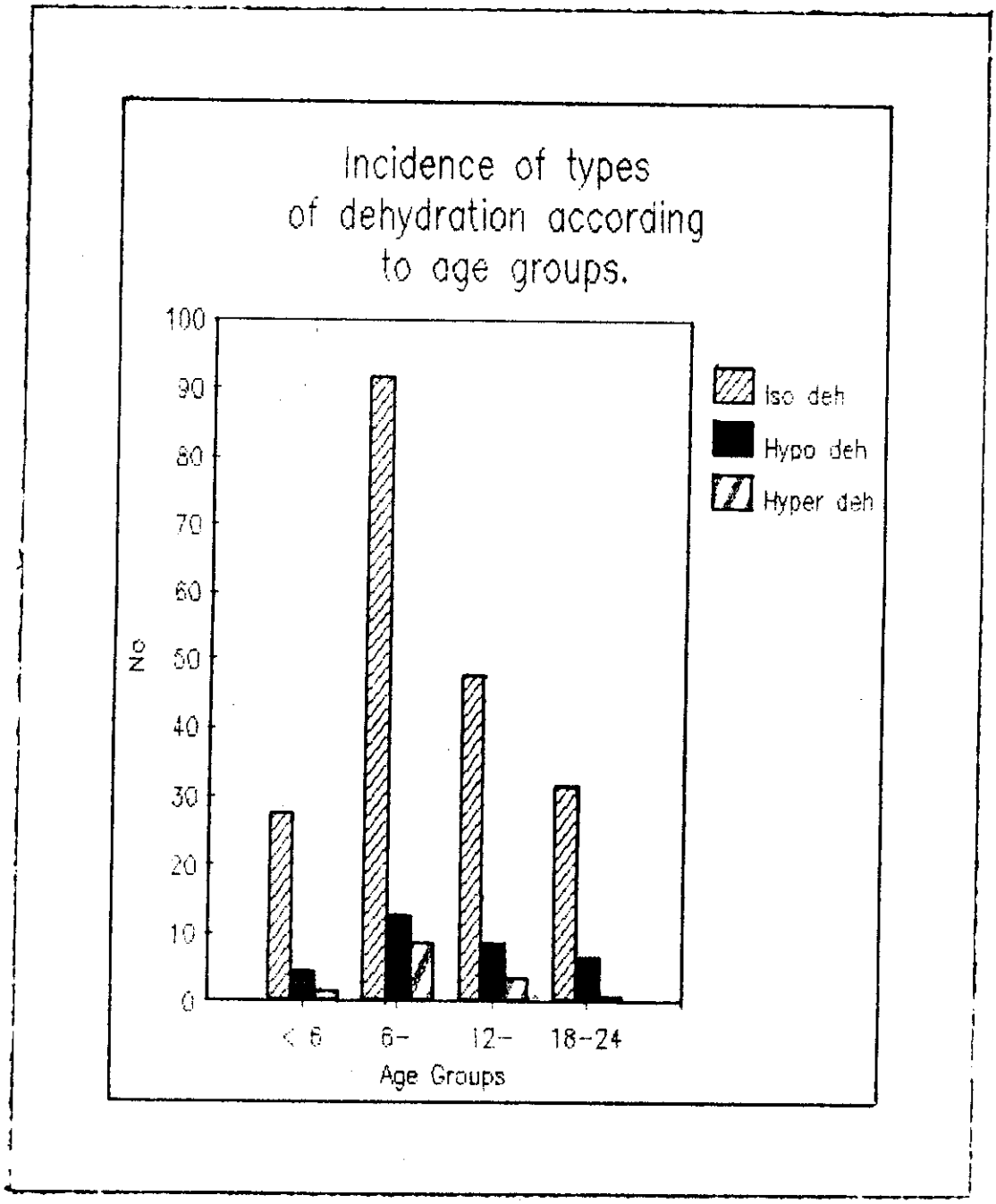
Figure 12


Incidence of types
of dehydration according
to age groups.
100
90
80
70
60
50
40
30
20
10
0
No
< 6
6-
12-
18-24
Age Groups
Iso deh
Hypo deh
Hyper deh

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4-HYPERNATREMIA IN RELATION TO SEX

Sex	Male		Female		Total	
	No.	Per.	No.	Per.	No.	Per.
Iso.deh.	115	57.5%	85	42.5%	200	100%
Hypo.deh.	20	58.8%	14	41.2%	34	100%
Hyper.deh	10	62.5%		37.5%	16	100%
total	145	58%	105	42%	250	100%

* $Chi^2 = 0.16$
* df = 2
* P >0.05

* 58% of the studied infants were males .
* 42% of the studied infants were females.
* 62.5% of the hypernatremic infants were males.
* 37.5% of the hypernatremic infants were females.

5- HYPERNATREMIA IN RELATION TO FEEDING PATTERN (A)-

type of feeding	Breast		Artificial		Mixed		decoctions		total	
	No.	Per.	No.	Per.	No.	Per.	No.	Per.	No.	Per.
Iso.deh.	120	82.76%	24	68.57%	19	79.17%	37	80.43%	200	80%
Hypo.deh.	18	12.41%	5	14.29%	4	16.67%	7	15.21%	34	13.6%
Hyper.deh.	7	4.83%	6	17.14%	1	4.26%	2	4.36%	16	6.4%
total	145	100%	35	100%	24	100%	46	100%	250	100%

* $Chi^2 = 8.49$
* df = 6
* P > 0.05

Breast		Artificial		Mixed		Decoctions		Total	
No.	Per.	No.	Per.	No.	Per.	No.	Per.	No.	Per.
145	80.56%	35	19.44%	24	9.6%	46	18.4%	250	100%

* Breast fed infants represents 80.56% of the studied infants
* Artificially fed infants represents 19.44%of the studied infants
* Mixed feeding represents 9.6%
* Infants given decoctions represents 18.4%
* Incidence of hypernatremic dehydration among breast fed infants is 4.83%.
* Incidence of hypernatremic dehydration among artificially fed infants is 17.14%.

6- RELATION OF HYPERNATREMIC TO FEEDING PATTERN (B)-

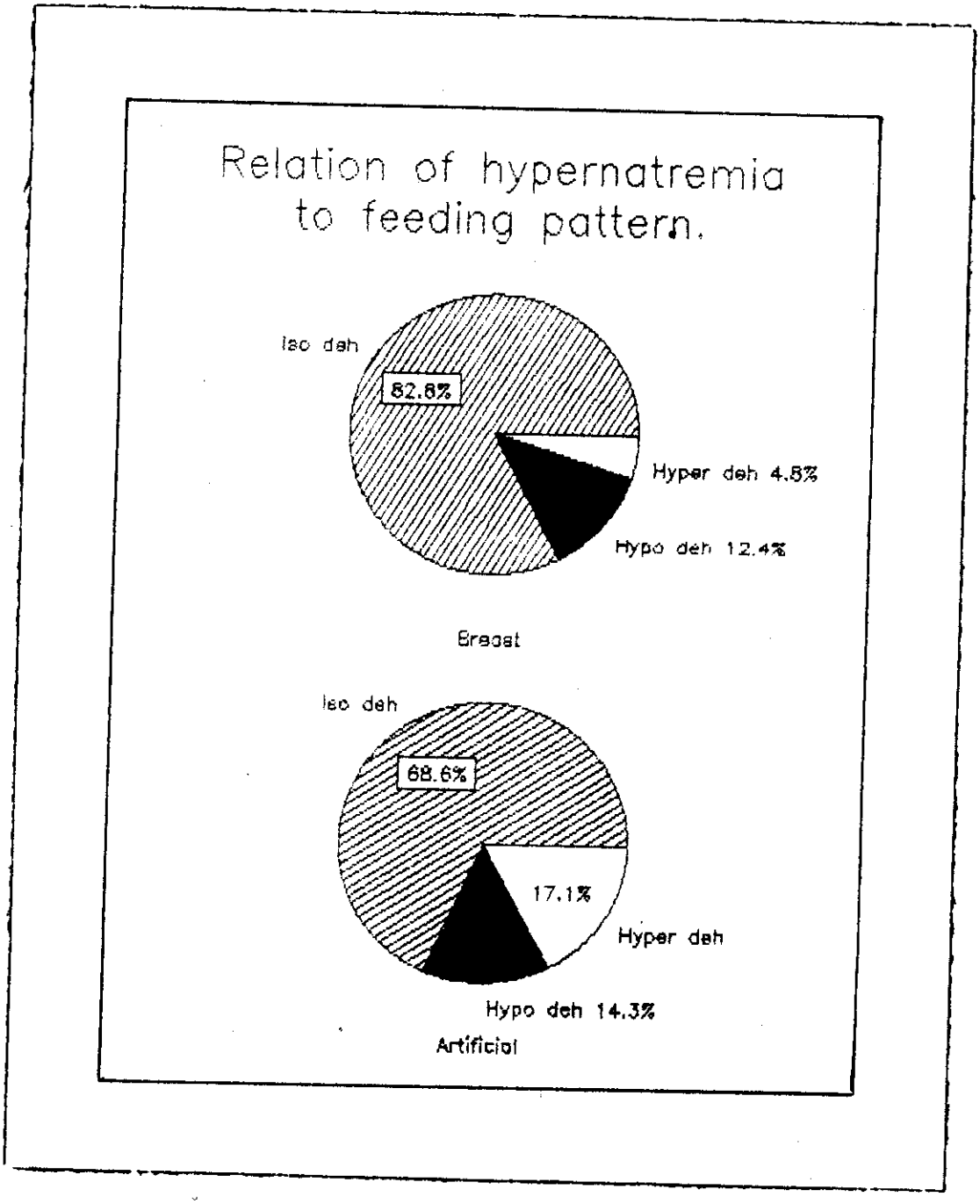
type of Feeding	Breast		Artificial		Total	
	No.	Per.	No.	Per.	No.	Per.
Iso.deh.	120	82.76%	24	68.57%	144	80%
Hypo.deh.	18	12.41%	5	14.29%	23	12.78%
Hyer.deh.	7	4.83%	6	17.14%	13	7.22%
Total	145	100%	35	100%	180	100%

* Chi^2 = 7.18
* df = 2
* P <0.05

Breast		Artificial		Total	
No.	Per.	No.	Per.	No.	Per.
145	80.56%	35	19.4%	180	100%

* A further study to hypernatremic and feeding pattern:
  - Artificially fed infants = 19.4%of studied group
  - Breast fed infants = 80.56% of studied group.
  - Incidence of hypernatremia among breast fed infants is 4.83%
  - Incidence of hyernatremia among artificially fed infants is 17.14%

Figure 13


Relation of hypernatremia to feeding pattern.
Iso deh
82.6%
Hyper deh 4.8%
Hypo deh 12.4%
Breast
Iso deh
68.6%
17.1%
Hyper deh
Hypo deh 14.3%
Artificial

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7- HYPERNATREMIA AND NUTRATIONAL STATUS

Nutrational status	well nourish.		malnourished		Total	
	No.	Per.	No.	Per.	No.	Per.
Iso. deh.	141	70.5%	59	29.5%	200	100%
Hypo. deh.	21	61.64%	13	38.34%	34	100%
Hyper. deh.	14	87.5%	2	21.5%	16	100%
Total	176	70.4%	74	29.6%	250	100%

* Chi^2 = 3.46

* df = 2

* P >0.05

* Well nourished infants = 70.4% of the studied group

* Malnourished infants = 29.6% of the studied group

* Among the hypernatremic infants :

- 87.5% were well nourished

- 12.5% were malnourished

	Well nourished	Malnourished
Number	176	74
Hypernatremic	14	2
Percent	8%	2.7%

* Incidence of hypernatremia among well nourished = 8%

* Incidence of hypernatremia among malnourished = 2.7%

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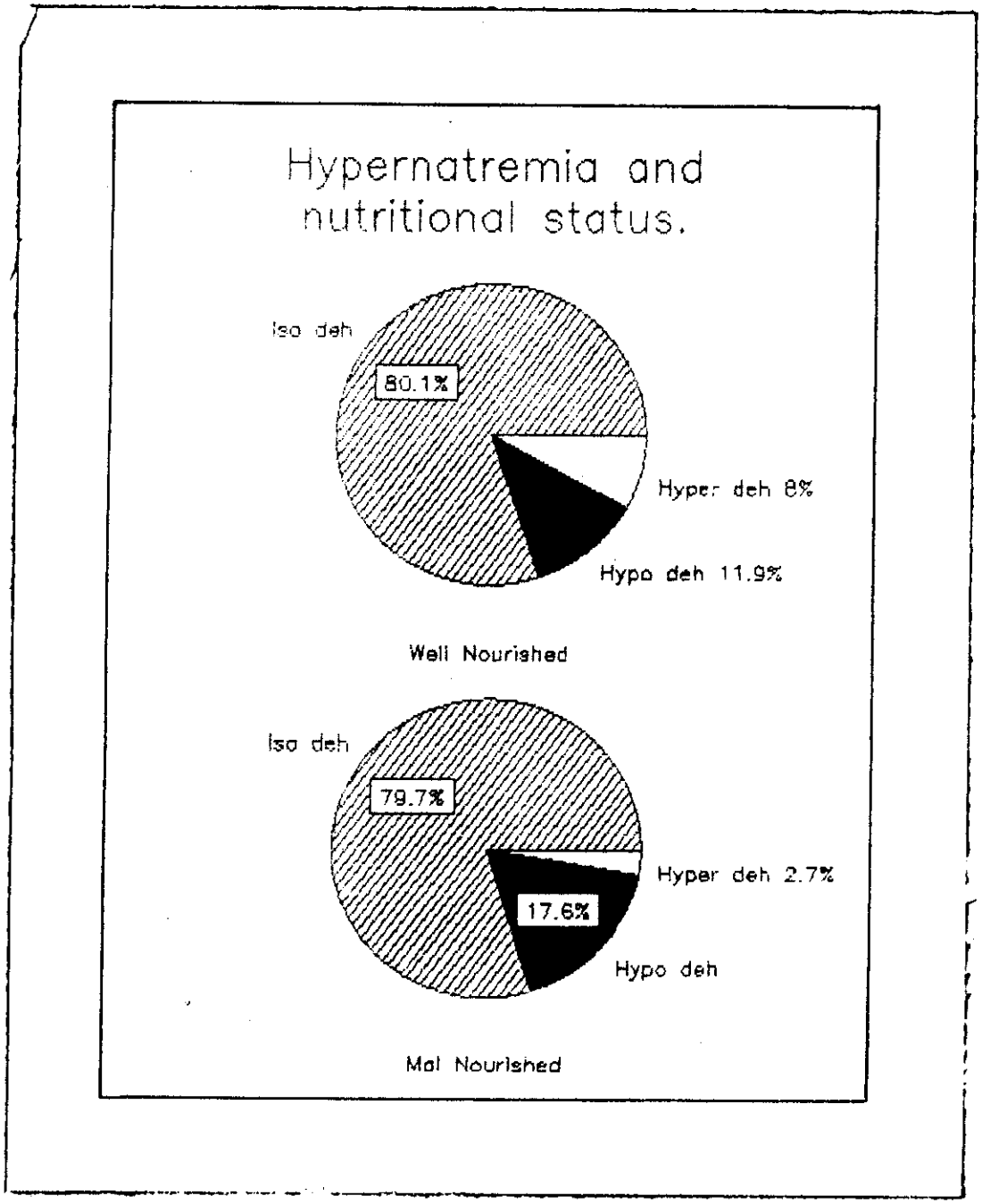
Figure 14


Hypernatremia and nutritional status.
Iso deh
80.1%
Hyper deh 8%
Hypo deh 11.9%
Well Nourished
Iso deh
79.7%
Hyper deh 2.7%
17.6%
Hypo deh
Mal Nourished

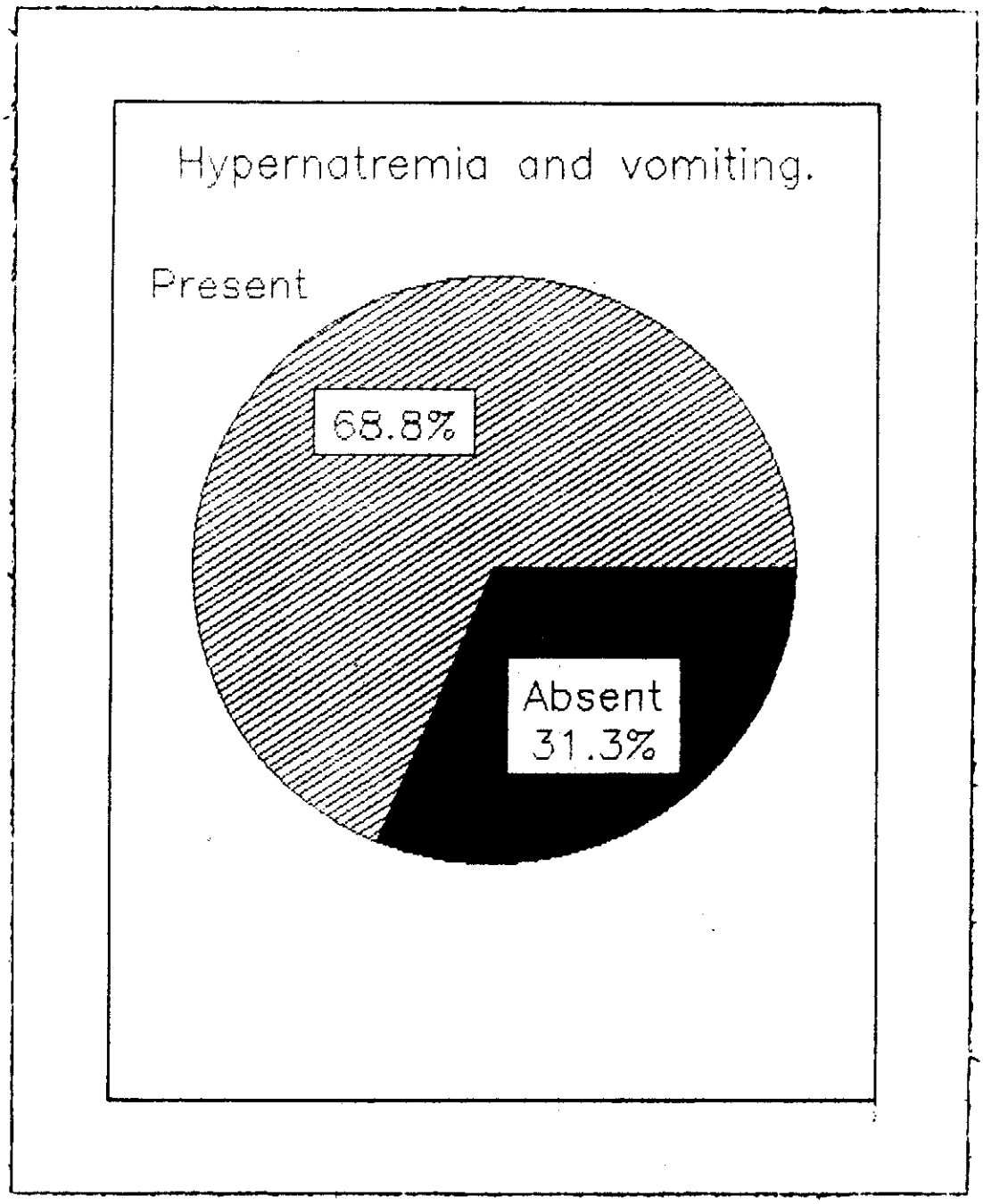
8- RELATION OF HYPERNATREMIA TO VOMITING

Presence or absence of vomiting	Vomiting is present		Vomiting is absent		Total	
	No.	Per.	No.	Per.	No.	Per.
Iso.deh.	103	51.5%	97	48.5%	200	100%
Hypo. deh.	25	58.8%	9	41.2%	34	100%
Hyper, deh.	11	68.7%	5	31.3%	16	100%
Total	139	55.6%	111	44.4%	250	100%

* Chi^2 = 6.91
* df = 2
* P < 0.05

* 51.5% of the studied infants had vomiting
* 48.5% of the studied infants did not have vomiting
* 68.7% of hypernatremic infants had vomiting
* 31.3% of hypernatremic infants did not have vomiting
* These data are statistically significant i.e P<0.05

Figure 15



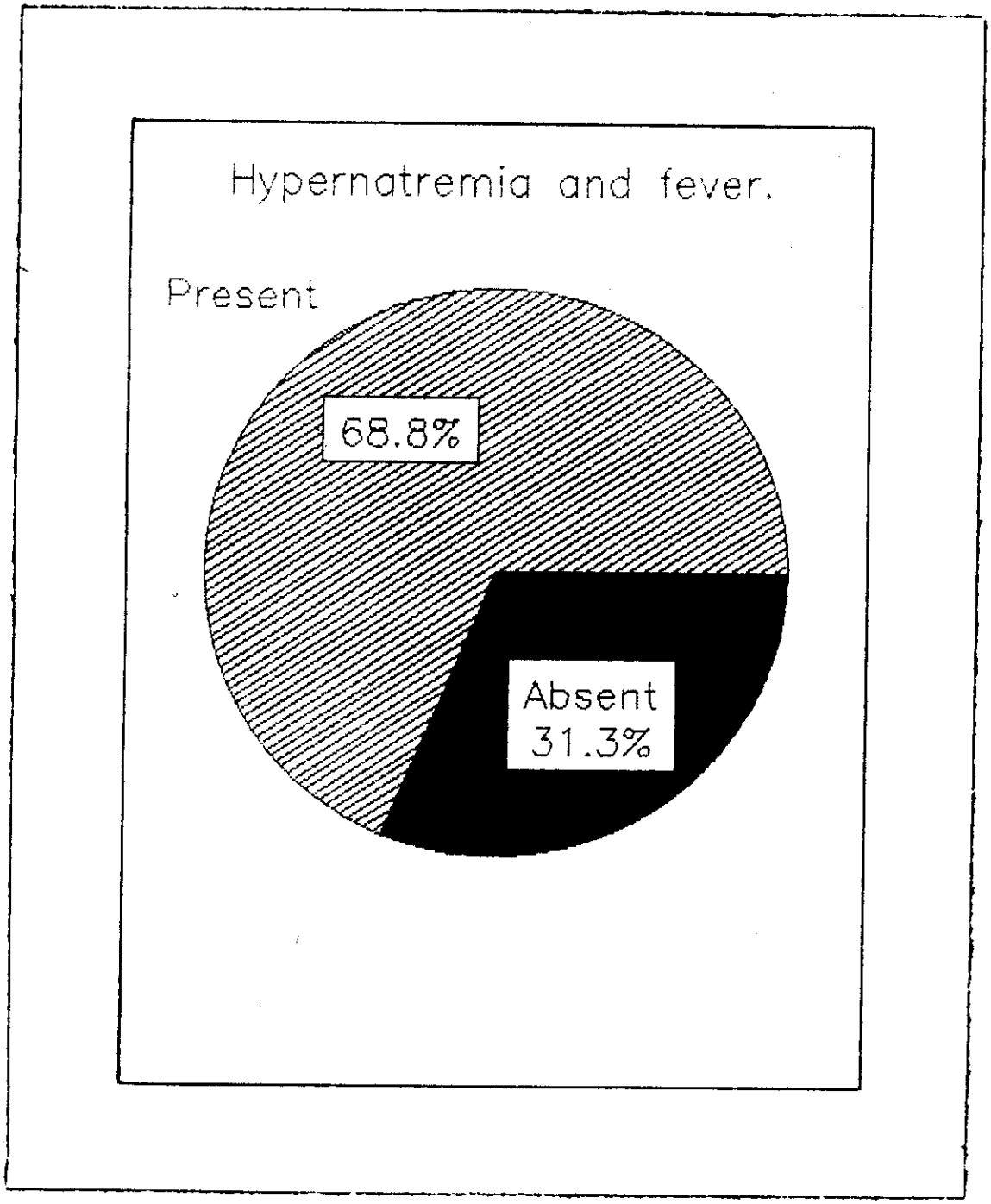
9- HYPERNATREMIA IN RELATION TO FEVER

Presence or absence of fever	Fever is present		Fever is abscent		Total	
	No.	Per.	No.	Per.	No.	Per.
Iso. deh.	36	18%	164	82%	200	100%
Hypo. deh.	13	38.2%	21	61.8%	34	100%
Hyper. deh.	11	68.7%	5	31.3%	16	100%
Total	60	24%	190	76%	250	100%

* $Chi^2 = 7.9$
* $df = 2$
* $P < 0.05$

* 24% of the studied infants had fever
* 76% of the studied infants did not have fever
* 68.7% of the hypernatremic infants had fever
* 31.3% of the hypernatremic infants did not have fever
* These data are statistically significant i.e $P < 0.05$

Figure 16



10- DURATION OF DIARRHEA BEFORE COMING TO THE ORAL REHYDRATION CENTER

Duration in days	Number	Percent
1 day	50	20%
2 days	132	52.8%
3 days	50	20%
4 days	9	3.6%
5 days	9	3.6%

* 20% of infants were seen within the 1st day of diarrhea
* 52.8% of infants were seen within the 2nd day of diarrhea
* 72.8% of infants were seen within the first two days of diarrhea

11- HYPERNATREMIA IN RELATION TO THE DEGREE OF DEHYDRATION

degree of dehydration	Mild		Moderate		Total	
	No.	Per.	No.	Per.	No.	Per.
Iso. deh.	182	91%	18	9%	200	100%
Hypo. deh.	32	67.7%	11	32.3%	34	100%
Hyper. deh.	9	56.3%	7	43.7%	16	100%
Total	214	85.6%	36	14.4%	250	100%

* $Chi^2 = 24.8$
* df = 2
* P < 0.01

* 85.6% of the studied infants had mild dehydration
* 14.4% of the studied infants had moderte dehydration
* 56.3% of hypernatremic infants had mild dehydration
* 43.7% of hypernatremic infants had moderate dehydration
* These data are statistically significant P < 0.01
* The low degree of dehydration reflects increased maternal knowledge so they brought their infants early before they developed sever dehydration

12- DEHYDRATION SCORE AND HYPERNATREMIA

Type of deh.	Number	Mean $\bar{X}$	stand.dev. S.D.	T.value versus Iso	P.value
Iso.	200	2.04	1.12		
Hypo.	34	3.06	1.13	3.74	<0.05
Hyper	16	3.44	1.55	3	<0.05

* Mean dehydration score for isonatremic infants is 2.04
* Mean dehydration score for hypernatremic infants is 3.06
* Mean dehydration score for hypernatremic infants is 3.44
* The mean score revealed that dehydration is mild (< 4) which is an evidence of high level of maternal knowledge.

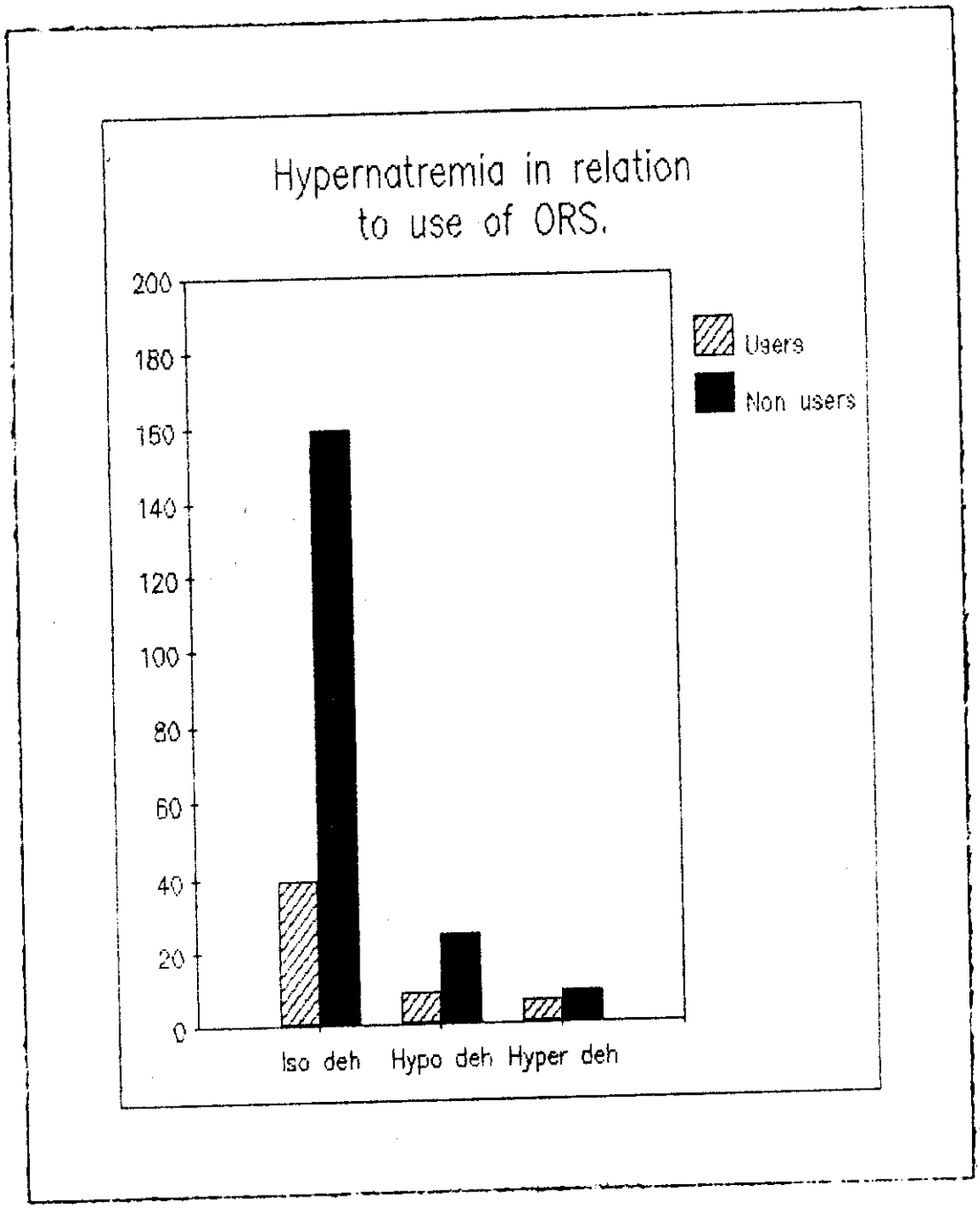
13- HYPERNATREMIA AND USE OF ORS

Users or non users	Users		Non users		Total	
	No.	Per.	No.	Per.	No.	Per.
Iso.deh.	40	20%	160	80%	200	100%
Hypo.deh.	9	26.5%	25	73.5%	34	100%
Hyper.deh.	7	43.7%	9	56.3%	16	100%
Total	56	22.4%	194	77.6%	250	100%

* $Chi^2 = 5.182$
* df = 2
* P > 0.05

* 22.4% of infants were users to ORS
* 77.6% of infants were non users
* Among hypernatremic infants
  - 43.7% were users
  - 56.3% were non users
* These data revealed that incidence of all types of dehydration is lower among users than among non users
* These data are non significant, i.e P > 0.05, because hypernatremia is a multifactorial phenomenon.

Figure 17


Hypernatremia in relation to use of ORS.
200
180
160
140
120
100
80
60
40
20
0
Users
Non users
Iso deh
Hypo deh
Hyper deh

14- HYPERNATREMIA IN RELATION TO NUMBER OF PACKETS

	No.	Mean $\bar{X}$	Standard deviation S.D.	T.vesus iso	P.value
Iso. deh.	40	3.45	1.47		
Hypo.deh.	90	3.11	1.9	0.68	>0.05
Hyper.deh.	7	5.29	2.63	2.86	<0.01

* Mean number of packets uesd in iso. deh. = 3.45
* Mean number of packets used in Hypo. deh. = 3.11
* Mean number of packets used in Hyper. deh. = 5.63

15- HYPERNATREMIA IN RELATION TO DURATION OF USE OF ORS

	No.	Mean $\bar{X}$	Standard deviation S.D.	T. versus iso	P. value
Iso. deh.	40	1.2	0.41		
Hypo. deh.	9	1.67	1.32	1.19	>0.05
Hyper. deh.	7	1.29	0.49	0.3	>0.05

* Mean duration of use in Iso. deh. = 1.2 days
* Mean duration of use in Hypo. deh. = 1.67 days
* Mean duration of use in Hyper. deh. = 1.29 days

16-HYPERNATREMIA IN RELATION TO SEASON

	Cold months		Hot months		Total	
	No.	Per.	No.	Per.	No.	Per.
Iso.deh.	72	36%	128	64%	200	100%
Hypo.deh.	8	23.53%	26	76.47%	34	100%
Hyper.deh.	5	31.25%	11	68.75%	16	100%
Total	85	34%	165	66%	250	100%

* $Chi^2 = 2.07$
* df = 2
* P > 0.05

* 34% of infants were seen in cold months
* 66% of infants were seen in hot months
* Among the hypernatremic infants :
  - 31.25% were seen in cold months
  - 68.75% were seen in hot months
* These data are not significant i.e P > 0.05

17_RELATION_OF_HYPERNATREMIA_TO_RESIDENCE

Residence	Urban		Rural		Total	
	No.	Per.	No.	Per.	No.	Per.
Iso.deh.	43	69.35%	157	83.5%	200	80%
Hypo.deh.	12	19.35%	22	11.7%	34	13.6%
Hyper.deh.	7	11.3%	9	4.8%	16	6.4%
Total	62	100%	188	100%	250	100%

	Number	Percent
Rural	188	75.2%
Urban	62	24.8%
Total	250	100%

* $Chi^2 = 6.25$
* df = 2
* P < 0.05

* 75.2% of infants were rural
* 24.8% were urban
* Incidence of hypernatremia was:
  - 11.3% in urban
  - 4.8% in rural
* Data are stastically significant i.e P< 0.05

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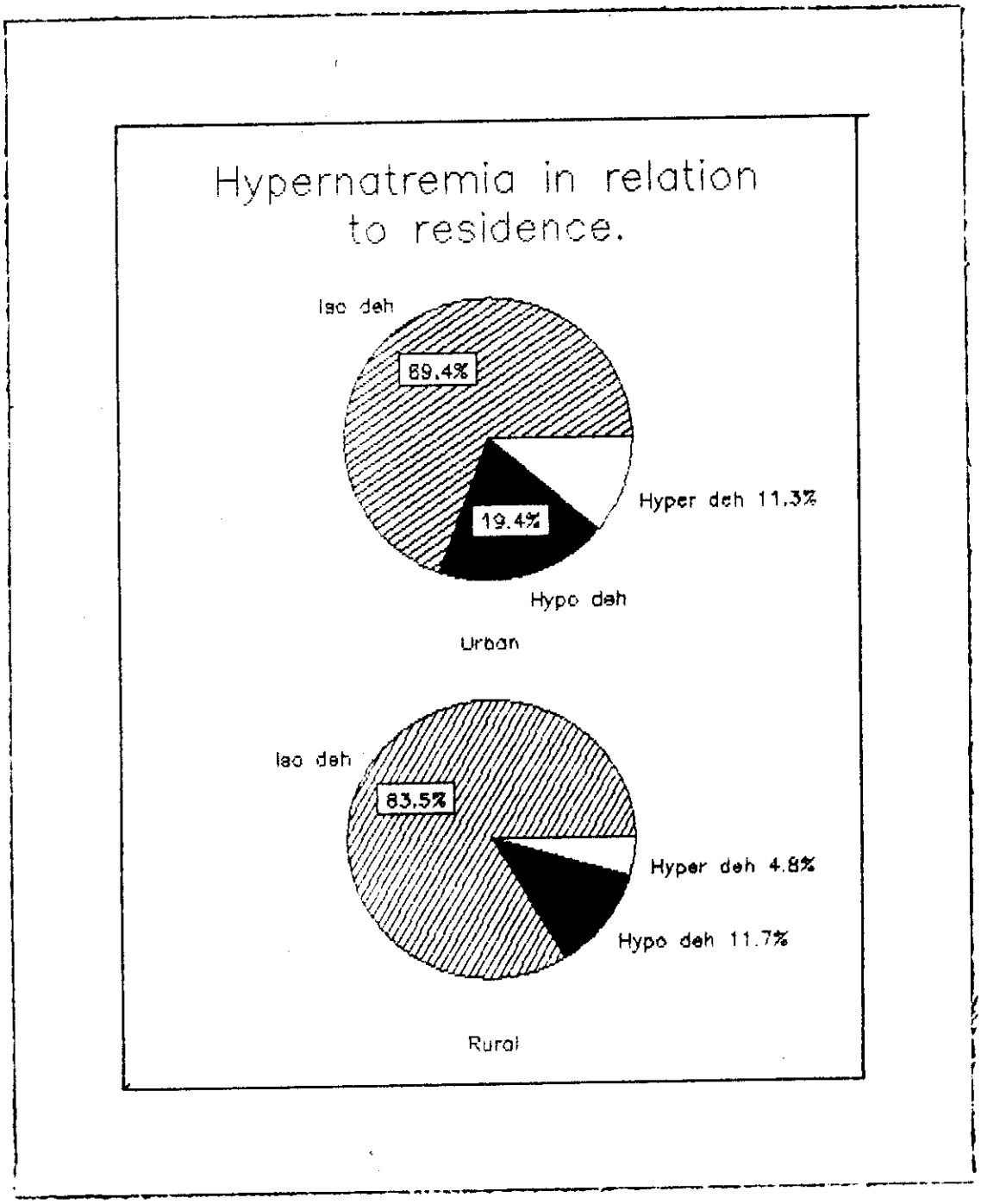
Figure 18


Hypernatremia in relation to residence.
Iso deh
69.4%
19.4%
Hyper deh 11.3%
Hypo deh
Urban
Iso deh
83.5%
Hyper deh 4.8%
Hypo deh 11.7%
Rural

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