ORIGINAL ARTICLE

Blood Urea Nitrogen (B. U. N.) in Gastroenteritis with Dehydration

by

SJAULI S. AMIN, JUSNIAR B. AND SUHARJONO

(From The Departement of Child Health, Medical School, University of Indonesia, Jakarta)

Abstract

The study on blood urea in 40 infants Suffering from gastroenteritis and ehydration has been made with the following findings :

1. *Twenty two out of 40 cases (55%) showed b lood urea content of more than 40 mg %.*
2. *Ten out of 40 cases (25%) still had blood urea content of more than 40 mg % after rehydration.*

This high blood urea content after rehydration was more frequently found in neonates than in non-neonates infants (33.3% : 23.5%).

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Introduction

We are often faced with the problem of inant and children with azotemia associated with diarrhoea and dehydration.

The azotemia may be due to (1) decrease of urea excretion secondary to reduced glomerular filtration rate, presumably due to reduced renal blood flow. (2) excess introgen blood, as in gastro intestinal bleeding. (3) acute renal failure secondary to shock or (4) preexisting renal disease (Brill et al., 1973).

Patients with azotemia due only to diarrhoea and dehydration had HT (half time) of 24 hours or less

Patients with prolonged blood urea half time should be suspected of having some more permanent forms of renal impairment such as acute renal failure or obstructive uropathy.

Complications occurring in gastroenteritis and dehydration are mainly acidosis, shoock, hypoglycemia and potassium deficiency.

The purpose of this clinical trial is to know the blood urea content in children with gastroenteritis and dehydration.

Material and Methods

Fourty diarrhoeal and dehydrated infant and hospitalized in the Depratment of Child Health, Medical School, University of Indonesia, Dr. Cipto Mangunkusumo General Hospital Jakarta, between August 1976 and December 1976 belong to this study. All patients included in this study have been admitted in the morning, since the laboratory is closed in the afternoon.

The ages of this patients were between 0 - 1 month and 1 - 24 months.

Dehydration was treated with intravenous luid 3 A solution (containing $^1/_3$ of 0,9 Na Cl + $^1/_3$ of 5% glucose + $^1/_3$ of $^1/_6$ mol Na Lactate), followed by DG solution (containing $^1/_3$ of Darrow solution + $^2/_3$ or 5% Glucose).

These solutions were given to cases of between 1 - 24 months.

To cases aged between 0 - 1 month, we gave 1 : 4 solution (containing $^4/_5$ glucose 5% + $^1/_5$ 0.9% NaCl).

Three A solution was given during the first 8 hours, and followed by DG solution for the next 16 hours. The amount of solution in 24 hours was 250 ml/kg BW or per 24 hours.

The blood urea was examined twice i.e. on admission before the introducing of intravenous fluids and after dehydration had been achieved. The blood urea was determined by the urease method (Varley, 1962).

Evaluation was mainly aimed at comparing the blood urea content in dehydration and rehydration.

Results

Seventeen patients (42.5%) have normal blood urea during dehidration and twenty three patients (57.5%) have increased blood urea. (more than 40 mg%).

The blood urea of 11 from that 23 patients (47.5%) became normal after rehydration.

TABLE 1 : *Age and sex distribution of children with gastroenteritis and dehydration*

Age	Sex		
	M	F	
0 - 1 mo	3	1	
1 - 24 mo	21	15	
	24	16	

TABLE 2 : *The blood urea nitrogen (BUN) content in 40 children with gastroenteritis and dehydration*

BUN in dehydration	Number	%
20 - 40 mg %	17	42.5
40 mg %	23	57.5

TABLE 3 : *Blood Urea Nitrogen (BUN) content in children with gastroenteritis and dehydration*

No.	Name	Sex	Age (mo)	Body wight in dehydration (gram)	Body wight in rehydration (gram)	BUN (mg%)	
						dehydration	rehydration
1.	M	F	22	7300	7500	32	26
2.	E	M	4	5400	6000	90	24
3.	N	M	6 d	1960	2100	80	50
4.	I	F	8	5650	5700	35	26
5.	A	F	7	5800	6250	75	39
M	I	M	5	6100	6350	58	60
7.	I	M	9	7150	7530	29	31
8.	S	M	8	7200	7600	109	87
9.	S	M	9	6600	6900	58	42
10.	S	M	13	7000	7780	70	42
11.	N	F	6	7600	8260	91	60
12.	R	M	3.5	3350	3500	60	40
13.	A	F	1.5	2800	3000	45	29
14.	S	M	3	4730	4900	39	39
15.	U	M	1.5	4000	4140	73	27
16.	D	F	8	6850	7200	29	32
17.	Z	M	13	8130	8270	30	27
18.	R	M	4 d	3760	3900	36	24
19.	A	M	4	5000	5250	34	29
20.	J	M	9	6000	6200	31	25
21.	W	M	4	3350	3500	49	35
22.	S	F	13	8200	8450	68	30
23.	L	F	9	7300	7450	34	30
24.	M	M	15	8000	8400	26	24
25.	K	M	18	7000	7600	37	30
26.	L	F	2	4000	4400	30	
27.	U	M	5 d	3000	3200	100	98
28.	A	F	1.5	2500	2600	30	28
29.	D	F	4	4500	4750	100	60
30.	J	M	3	4750	4900	39	29
31.	E	F	7	6800	7220	100	70
32.	A	M	6	6300	6500	107	65
33.	D	F	22 d	2700	2850	50	50
34.	A	M	43 d	1900	2000	50	40
35.	A	F	32 d	3100	3830	26	25
36.	A	M	2	4100	4250	60	35
37.	L	M	8	5600	5900	60	33
38.	M	F	7	6000	6200	34	26
39.	S	M	6	6800	6950	25	24
40.	D	F	7	6600	6800	55	36

Diarrhoea in one of the commonest reasons for hospitalization of children in Indonesia (Suharjono, 1976).

Azotemia (high BUN, creatinine etc.) may be the result of reduced glomerular filtration as in patients with diarrhoea and dehydration; increased nitrogen load in the blood as in patients with G I tract bleeding (extra-renal cause); acute renal failure secondary to shock, and intrinsic permanent renal disease.

Twenty two (55%) out of 40 cases showed an urea content of more than 40 mg%. Ludan (1974) gave a method for predicting renal disease in diarrhoea with dehydration, viz BUN half time.

BUN half time is the time needed for blood urea nitrogen taken on admission to fall by 50%. A BUN half time of less than 24 hours indicates a normal kidney while more than 24 hours is a sign of intrinsic renal disease.

It appears from thepresent study, that in 10 out of 40 (25%) the urea was skill more than 40 mg%, after dehydraktion had been overcome, viz case No. 3, 6, 8, 9, 11, 27, 29, 31 and 32.

It depends on what oriteria we would like to use for the word "uraemia", since in non-breastfed children (cow's milk) the normal value of urea in the blood is higher (Jelliffe and Jelliffe, 1976).

Two out of 10 cases showing the urea more than 40 mg% are neonates of 6 and 5 days (case No. 3 and 27), their serum urea was respectively 80 and 100 mg% before rehydration and 50 and 90 mg% after rehydration.

It means that 2 out of 6 neonates in this study (33.3%) still had blood urea of more than 40 mg% after rehydration; while in other infants (non-neonates) this same condition was encounted in 8 out of 34 (23.5%).

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