

Original Research Article

Clinical profile of dehydration fever in neonates in a tertiary care hospital

Muhammad Hassan, Adarsh E., Rajanish K. V.*

Department of Pediatrics, Rajarajeshwari Medical College Hospital, Bangalore, Karnataka, India

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***Correspondence:**

Dr. Rajanish K. V.,

E-mail: rajanish.kv@gmail.com

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ABSTRACT

Background: The aim of this study was to determine the clinical profile of neonates admitted with dehydration fever and ascertain the maternal and neonatal factors affecting it.

Methods: A observational descriptive study was conducted at Rajarajeshwari Medical College and hospital, population included neonates who were admitted in NICU with dehydration fever.

Results: The study were conducted among 50 neonates admitted with dehydration fever. Majority of neonates (72%) were diagnosed with dehydration fever on day 3 of life. 84 % neonates were born to primiparous mothers. In the study there was significant difference in mean birth weight, weight at admission and percentage of weight loss between birth weight and weight at admission with respect to symptoms on presentation. Mean % of weight loss was 12.06 when dehydration fever was presented with fever, 11.29 when dehydration fever presented with decreased urine output, 18.44 when presented with both fever and decreased urine output and 12.73 when presented with jaundice these values were statistically significant.

Conclusions: Dehydration fever occurs most commonly on day 3 or after, effective measures should be initiated for early diagnosis and prevention of complications like effective breast-feeding counselling, proper techniques, good latching and supplementation of artificial feeds if required and monitoring of daily weight and daily urine output.

Keywords: Dehydration fever, Hyponatremia, Lactation failure, Neonates

INTRODUCTION

Breast milk is the main nutrient for the growth and development of the infant.¹ Normal neonatal feeding is advocated on demand every 2 hours. Intake of adequate breast feeding depends on normal mammary development (mammatogenesis), unimpeded initiation of lactation (lactogenesis), sustained on-going milk synthesis (galactopoiesis), infant breastfeeding techniques. Total daily milk intake depends on the frequency and duration of feeds. The World Health Organization recommends, all infants should be exclusively breastfed for the first 6 months of life, and complimentary feeding should be started thereafter.² Dramatic weight loss and dehydration

with an increase in serum sodium (Na) concentration related to the insufficient breast milk intake may be observed mostly on the initial days of the infant.³ Weight loss of new-born babies in the first few days of life is a clinically known entity. Mean weight loss is approximately 6% of birth weight in well babies during the first 3 days.⁴⁻⁶ Neonatal hypernatraemic dehydration (NHD) is defined as weight loss (>10%) associated with a serum sodium ≥ 145 mmol/L.^{7,8} It is associated with breastfeeding failure in neonates, despite improving resources and supporting women to breastfeed. Early weighing and examination by trained healthcare professionals to recognise inadequate feeding are practice recommended by the American Academy of Pediatrics and

the UNICEF UK baby friendly initiative.^{9,10} Signs and symptoms of neonatal hypernatraemic dehydration include fever, decreased urine output and decreased activity, weight loss lethargy and seizures. Hypernatraemic dehydration associated with cerebral oedema, intracranial haemorrhage, hydrocephalus, seizures and gangrene are a potentially lethal condition.¹¹ The present study was carried out with the aim to determine the maternal and neonatal factors affecting dehydration fever in neonates at our hospital.

METHODS

It was an observational descriptive study where neonates were admitted in NICU with dehydration fever over period of 2 years from June 2016 to June 2018. Hospital based convenience sample were taken. This observational descriptive study was undertaken at Rajarajeswari Medical College and Hospital. All babies born during the study period (2 years) who were admitted in NICU with hyper-natraemic dehydration were included in the study. Detailed history of maternal and neonatal factors of neonates admitted in NICU with dehydration fever, and lab investigations and results were analysed by descriptive statistics in terms of proportion and percentages for categorical variables and mean and standard deviation for continuous variables with P-value of <0.005 was taken as significant.

Inclusion criteria

- Babies with serum Na >145meq/l,
- Euglycemia
- Term babies
- No clinical and lab evidence of sepsis.

Exclusion criteria

- Clinically detected major congenital malformation
- Antenatally detected central nervous system malformations
- Parents who were unwilling to give consent.

Statistical analysis

Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Categorical data was represented in the form of frequencies and proportions. Chi-square test was used as test of significance for qualitative data. Continuous data was represented as mean and standard deviation. ANOVA (Analysis of Variance) was the test of significance to identify the mean difference between more than two groups for quantitative data. Graphical representation of data: MS Excel and MS word was used to obtain various types of graphs such as bar diagram. P value (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of

statistical tests. Statistical software: MS Excel, SPSS version 22 (IBM SPSS Statistics, Somers NY, USA) was used to analyze data.

RESULTS

Table 1 describes sociodemographic profile distribution in mother and presenting complaints in neonates. In the study among subjects presenting with hypernatremic dehydration, 24% of mothers were in the age group <20 years, 48% in the age group 21 to 25 years, 28% were in the age group 26 to 30 years. Mean mother age was 24.1±3.066 years and median age was 25 years. Eighty-four% were Primigravida and 16% were Multigravida. Twelve% had gestational HTN, 6% had preeclampsia, 10% had PROM, 6% had vaginitis. 28% had lactation failure, 72% had no lactation failure. Twenty-two% were on supplementary formula feeds. 32% presented with fever, 22% had decreased urine output, 22% had fever + decreased urine output and 24% had jaundice.

Table 1: Sociodemographic profile distribution in mother and presenting complaints in neonates.

		Count	%
Age	<20 years	12	24.0
	21 to 25 years	24	48.0
	26 to 30 years	14	28.0
Parity	Multigravida	8	16.0
	Primigravida	42	84.0
Maternal complications	Nil	33	66.0
	Gestational hypertension	6	12.0
	Pre-eclampsia	3	6.0
	Prom	5	10.0
	Vaginitis	3	6.0
Lactation failure	Decreased	14	28.0
	Normal	36	72.0
Supplementary formula feeds	No	39	78.0
	Yes	11	22.0
Presenting symptoms	Fever	16	32.0
	Decreased urine output	11	22.0
	Fever + decreased urine output	11	22.0
	Jaundice	12	24.0

Table 2 describes association between symptoms at presentation and neonatal factors neonates presenting on day 2, majority had jaundice, on day 3, majority presented with fever, on day 4, majority presented with decreased urine output and jaundice and on day 5, majority presented with decreased urine output. In the study those with weight loss >10%, majority presented with Jaundice, decreased urine output and fever +decreased urine output respectively and 21.4% presented with fever.

Table 2: Association between symptoms at presentation and neonatal factors.

		Group								P value # (Chi square test)
		Fever		Decreased urine output		Fever + decreased urine output		Jaundice		
		Count	%	Count	%	Count	%	Count	%	
Supplementary feeds	No	11	28.2	9	23.1	10	25.6	9	23.1	0.568
	Yes	5	45.5	2	18.2	1	9.1	3	27.3	
Day of life	2	2	28.6	0	0.0	0	0.0	5	71.4	0.02*
	3	14	38.9	7	19.4	10	27.8	5	13.9	
	4	0	0.0	1	50.0	0	0.0	1	50.0	
	5	0	0.0	3	60.0	1	20.0	1	20.0	
Sex	Female	7	29.2	6	25.0	3	12.5	8	33.3	0.275
	Male	9	34.6	5	19.2	8	30.8	4	15.4	
Weight loss >10% at admission compared to birth weight	No	7	87.5	0	0.0	0	0.0	1	12.5	0.003*
	Yes	9	21.4	11	26.2	11	26.2	11	26.2	

*Statistically significant

Table 3: Comparison between symptoms at presentation and birth weight and weight at admission

Group	Birth weight					Weight at admission				
	Mean	SD	Minimum	Median	Maximum	Mean	SD	Minimum	Median	Maximum
Fever	3.39	0.27	2.90	3.50	3.70	2.98	0.35	2.40	2.95	3.50
Decreased urine output	3.10	0.26	2.80	3.10	3.55	2.75	0.25	2.50	2.70	3.18
Fever + decreased urine output	2.83	0.52	2.10	3.00	3.50	2.30	0.47	1.86	2.10	3.05
Jaundice	2.67	0.38	2.10	2.80	3.20	2.33	0.31	1.86	2.42	2.70
P value	<0.001*					<0.001*				

*Statistically significant

Table 4: Comparison between symptoms at presentation and weight, electrolyte profile and renal function test.

	Group								P value#
	Fever		Decreased urine output		Fever + decreased urine output		Jaundice		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Percentage weight loss	12.06	6.02	11.29	1.00	18.44	9.47	12.73	2.50	0.019*
Sodium	155.44	3.85	152.09	2.07	153.09	4.55	153.25	3.44	0.111
Potassium	4.33	0.41	4.44	0.43	4.84	0.93	4.38	0.38	0.131
Urea	49.75	20.73	61.73	30.41	55.91	12.87	50.75	17.42	0.487
Creatinine	0.88	0.51	1.06	0.61	1.16	0.60	1.10	0.78	0.648

#ANOVA test, *Statistically significant

Table 3 gives comparison between symptoms at presentation and birth weight and weight at admission. In the study there was significant difference in mean birth weight, weight and admission and percentage weight loss between birth weight and admission with respect to symptom on presentation.

Table 4 gives comparison between symptoms at presentation and weight, electrolyte profile and renal function test. Those presented with jaundice had lowest birth weight and weight at admission and those presented

with fever + decreased urine output had highest percentage of weight loss in the study.

DISCUSSION

The study was conducted among 50 neonates admitted with dehydration fever in NICU, Rajarajeshwari medical college hospital, Bangalore. Seventy-two % neonates were born to mother’s age less than 25 years, which suggests that, younger the age more the feeding problems leading to dehydration fever, but maternal age was not

statistically significant in present study. 84 % neonates were born to primiparous mothers, which suggests that feeding problems leading to dehydration fever was common in primiparous mothers and thus affected the neonates born by first order. Seventy-two% of mothers had normal milk production, but those neonates developed dehydration and fever because of improper feeding techniques, most common being improper position leading to improper latching thus causing lactation failure. Retracted nipple was the other main cause of lactation failure in other mothers with normal milk production. Our findings were in consistent with other studies.^{9,10} Majority of neonates (72%) were diagnosed with dehydration fever on day 3 of life, which suggests that day 3 is the peak time for the development of dehydration fever and measures to prevent dehydration fever should be initiated as early as possible. These measures include proper lactation counselling which consists of teaching mothers about the right positioning of baby while breast feeding, technique and signs of good latching, duration of feeds and ways to assess effective breast feeding like, by looking for adequate urine output. Our findings were in consistent with other studies.⁹⁻¹¹ There is no gender association with dehydration fever which was statistically significant. In the study there was significant difference in mean birth weight, weight at admission and percentage of weight loss between birth weight and weight at admission with respect to symptoms on presentation. When the baby presented with fever, the mean birth weight was 3.39kg and was 3.10kg when it presented with decreased urine output, 2.83kg when presented with both fever and decreased urine output and 2.67kg when presented with jaundice. These values are statistically significant. The study suggests that as the birth weight decreases, higher the chance of presenting with complaints like both fever and decreased urine output. Mean birth weight at admission was 2.98kg when dehydration fever was presented with fever, 2.75kg when dehydration fever presented with decreased urine output, 2.30kg when presented with both fever and decreased urine output and 2.33kg when presented with jaundice and these values were statistically significant. The study suggests that as the weight at admission decreases higher the chance of presenting with complaints like both fever and decreased urine output. Mean % of weight loss was 12.06 when dehydration fever was presented with fever, 11.29 when dehydration fever presented with decreased urine output, 18.44 when presented with both fever and decreased urine output and 12.73 when presented with jaundice these values were statistically significant. The study suggests that as the weight at admission decreases higher the chance of presenting with complaints like both fever and decreased urine output.¹¹

CONCLUSION

Dehydration fever is one of the serious complications during the post-natal period. As most of the dehydration

fever occurs on day 3 or after, effective measures should be initiated for early diagnosis and prevention of complications. Preventive measures include prevention of dehydration fever like, effective breast feeding counselling, proper techniques, good latching and supplementation of artificial feeds if required and monitoring of daily weight and daily urine output.

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