



A Study of Effect of Fluid Restriction on Mortality and Morbidity Pattern in Term Neonates with Perinatal Asphyxia Admitted In NICU, KGH

Authors

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Abstract

Introduction: *Perinatal Asphyxia is one of the commonest Neonatal problems and contributing significantly to Neonatal Morbidity and Mortality. This study is done for controlling the consequences of Hypoxic Ischaemic Encephalopathy following Perinatal Asphyxia with careful management of fluid and avoidance of Cerebral Edema.*

Aims and Objectives

- To assess the effects of Fluid Restriction (FR) and Full Fluid (FF) administration on mortality and morbidity patterns in term neonates with Perinatal Asphyxia.*
- Comparison of occurrence of seizures in FR and FF group.*

Materials and Methods: *This is prospective study conducted in babies admitted in NICU, KGH with Perinatal Asphyxia from May2018 to May2019. 62 babies were included in this study and 31 were subjected to FR. (2/3rd of total requirement)*

Inclusion Criteria: *Term neonates >37weeks with Perinatal Asphyxia (In Born, Out Born with APGAR<6) at 5min admitted in KGH*

Exclusion Criteria

- Preterm babies*
- Babies with Congenital Malformations, Renal Failure, Suspected Metabolic Disease, MAS, Congenital Infections.*

Results: *62 babies admitted in NICU are grouped into FR (31) and FF(31) of that 17% Mortality noted in FR group and 3.5% FF group. In FR group progression of HIE-II to HIE-III is more and there is less frequency of seizures in FR group*

Conclusions: *FR group showed increased encephalopathy and more chances of AKI In fluid restricted group and no significant change in mortality. There is decreased frequency of seizures in FR group.*

Introduction

Perinatal asphyxia is one of the commonest neonatal problems contributing significantly to neonatal mortality and morbidity. It is the 2nd most important cause of neonatal death after infection accounting for 30% mortality

Approximately 15-20% who exhibit HIE actually die during newborn period.

Current recommendation is to control consequences of hypoxic ischemic encephalopathy by careful management of fluids with avoidance of fluid overload with hope of avoiding cerebral edema.

Incidence of hypoxic ischemic encephalopathy was estimated to be 1 per 1000 live births.

Aims and Objectives

- To assess the effect of fluid restriction and full fluid administration on mortality and morbidity pattern in full term neonates with perinatal asphyxia
- Comparison of occurrence of seizures in full fluid and fluid restricted group

Materials and Methods

- This is prospective study done in NICU, KGH conducted from may 2018-may 2019 on 62 babies. Half of them were subjected to fluid restriction (2/3rd of total requirement) and monitored for 1st 3days.

Inclusion Criteria

- Term neonates (>37weeks with perinatal asphyxia (inborn and outborn with APGAR<6 at 5min admitted in KGH

Exclusion Criteria

- Preterm babies
- Babies with congenital malformations, renal failure, suspected metabolic disease, MAS, congenital infections.

Methodology

- Ethics committee approval taken.
- Detailed history and physical examination at admission
- Parameters included are weight , HIE staging, urine output, seizures and neurological examination at the time of discharge and their outcome
- In addition to routine investigations babies sampled for blood urea, creatinine, electrolytes and other imaging modalities like CT and MRI brain done when indicated.

Study Variables

- Dependent variables: outcome (discharge/death)
- Independent variables: gestational age, sex, place of delivery, medical illness of mother.
- Statistical methods:

Babies were monitored and results tabulated in Excel chart and CHI- square test and student “t”

test was applied and results noted. Z-test was used to test the significant difference between two proportions. p value < .05 was considered for statistical significance

Results

APGAR was noted for all neonates at 1 and 5 minutes

The mean APGAR score at 1 min was 4 and 3.9 respectively for FF and FR groups.

Mean APGAR score at 5 min was 4.90 and 4.94 for FF and FR group.

APGAR score at presentation to hospital

VARIABLE	GROUP	N	MEAN	RANGE	'p' value
APGAR at 1 min	Full Fluid	31	4.00	3-5	0.473
	Fluid Restriction	31	3.90	3-5	
	Total	62	3.95	3-5	
APGAR at 5 min	Full Fluid	31	4.90	3-5	0.820
	Fluid Restriction	31	4.94	4-6	
	Total	62	4.92	3-6	

All the babies were in stage II HIE at the time of admission and the progression of encephalopathy was documented with fluid intervention.

At the end of 3 days 1 baby (3.2%) progressed to stage III in FF group and 7 babies (23.8%) in FR group.

p value was statistically significant that is 0.035.

HIE (SARNAT AND SARNAT) status of newborn in 1st 3days of intervention

	Group	HIE		'P' value
		2	3	
Day 1	Full fluid	31(100%)		
	Fluid restriction	31(100%)		
day 2	Full fluid	30(96.8%)	1(3.2%)	.035
	Fluid restriction	27(90%)	3(10%)	
Day 3	Full fluid	30(100%)		
	Fluid restriction	25(86.2%)	4(13.8%)	

30 babies in both groups had seizures within 24 hours of delivery and remaining 2 had seizures within 48 hours.

Frequency of seizures was found to be higher in FF group.

The frequency and duration of antiepileptics was higher in FF group but the need for >1 antiepileptic was higher in FR group.

Frequency of seizures in 1st 3 days of fluid management

	< 5seizures	>5 seizures
Full fluid	27	4
Fluid restriction	28	3

The average day of initiation of breastfeeding in FF group was 6.3 days and FR group 7.35 days.

The average day of discharge with FF group was 8.83 days and FR group was 10.5 days.

Day of initiation of breastfeeding and day of discharge

	GRO UP	N	MEA N	RANG E	p value
Day of discharge	FF	30	8.83	7-15	0.011
	FR	26	10.50	6-17	
Day of breastfeeding	FF	30	6.30	4-9	0.067
	FR	26	7.35	4-12	

At discharge on neurological examination 2 infants were abnormal in FF group and 3 infants were abnormal in FR group(p value 0.524) which is statistically not significant.

Neurological status at discharge

GROUP	NEUROLOGICAL EXAMINATION AT DISCHARGE		p VALUE
	NORM AL	ABNORM AL	
FULL FLUID	28 (93.3%)	2 (6.7%)	0.524
FLUID RESTRICTION	23 (88.5%)	3 (11.5%)	

From FF group 1 baby expired with HIE and multiorgan dysfunction. This baby had APGAR score <3.

From FR group 5 babies out of which 3 had multiorgan dysfunction. Among the 5 babies of FR group, 2 babies had APGAR score <=3 and other 3 babies had score of 4-6.

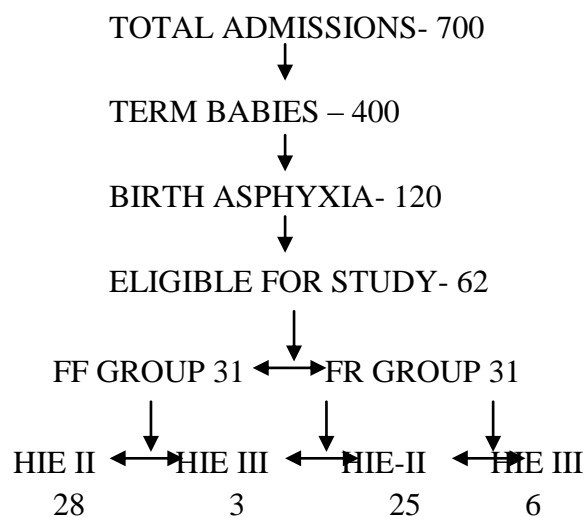
Study outcome

GROUP	OUTCOME		p VALUE
	discharge	death	
FULL FLUID	30 (96.8%)	1 (3.2%)	0.086
FLUID RESTRICTION	26 (83.9%)	5 (16.1%)	
TOTAL	56 (90.3%)	6 (9.7%)	

In FF group 2 babies CT scan and in FR group 3 babies CT scan was suggestive of cerebral edema.

CT scan finding in 1st 48 hours life

	IMAGING	GROUP	NORMAL	EDEMA
DAY 1	CT	FULL FLUID	27(96.4%)	1(3.6%)
		FLUID RESTRICTION	27(93.1%)	(6.9%)
DAY 2	CT	FULL FLUID	1(50%)	1(50%)
		FLUID RESTRICTION	1(50%)	1(50%)



Conclusion

- In our study FR group showed significant progression of encephalopathy in first 3 days of fluid management when compared to unrestricted group.
- The study showed a forward trend towards increased mortality with fluid restriction.
- The frequency of seizures was less in fluid restricted group.
- This study showed that fluid restriction did not show any advantages in the management of babies with birth asphyxia and in contrast has increased the morbidity associated with birth asphyxia.

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