

A STUDY ON VOIDING PATTERN OF NEWBORNS WITH HYPOXIC ISCHEMIC ENCEPHALOPATHY

Hypothesis / aims of study

To investigate the difference of voiding pattern between newborns with and those without hypoxic ischemic encephalopathy (HIE).

Study design, materials and methods

A total of 40 hospitalized newborns aged 4 to 21 days were included in this study. Twenty-one of them were preterm newborns with HIE, another 19 preterm newborns without HIE. The voided volume, post void residual (PVR) volume, consciousness at voiding, voiding time, voiding frequency as well as the quantity of intake milk and liquid within 4 hours from 8AM to 12AM were recorded. The liquid intake was same in both groups according to standard protocol. The diaper weight difference before and after voiding was defined as voided volume. The PVR volume was determined by ultrasound. The state of consciousness at voiding was monitored by electroencephalography.

Results

Voided volume and rate of consciousness at voiding was significant lower in newborns with HIE compared with the control group [(10.8±6.5) ml, (16.3±17.1) % vs. (14.1±7.1) ml, (57.1±21.0) %, (P<0.05), respectively], whereas PVR volume and voiding frequency were significant higher [(1.6±1.0) ml, (4.0±1.1) times vs. (1.2±0.9) ml, (3.2±0.9) times per 4 hours, (P<0.05), respectively].

Interpretation of results

The difference of voiding pattern between newborns with HIE and those without HIE is significant.

Concluding message

The differences in voiding pattern supported the concept that the higher centres of the central nervous system were involved in the control of voiding, HIE had a significant effect on voiding pattern in preterm newborn.

Disclosures

Funding: NONE **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Ethics Committee of The First Affiliated Hospital of Zhengzhou University **Helsinki:** Yes **Informed Consent:** Yes

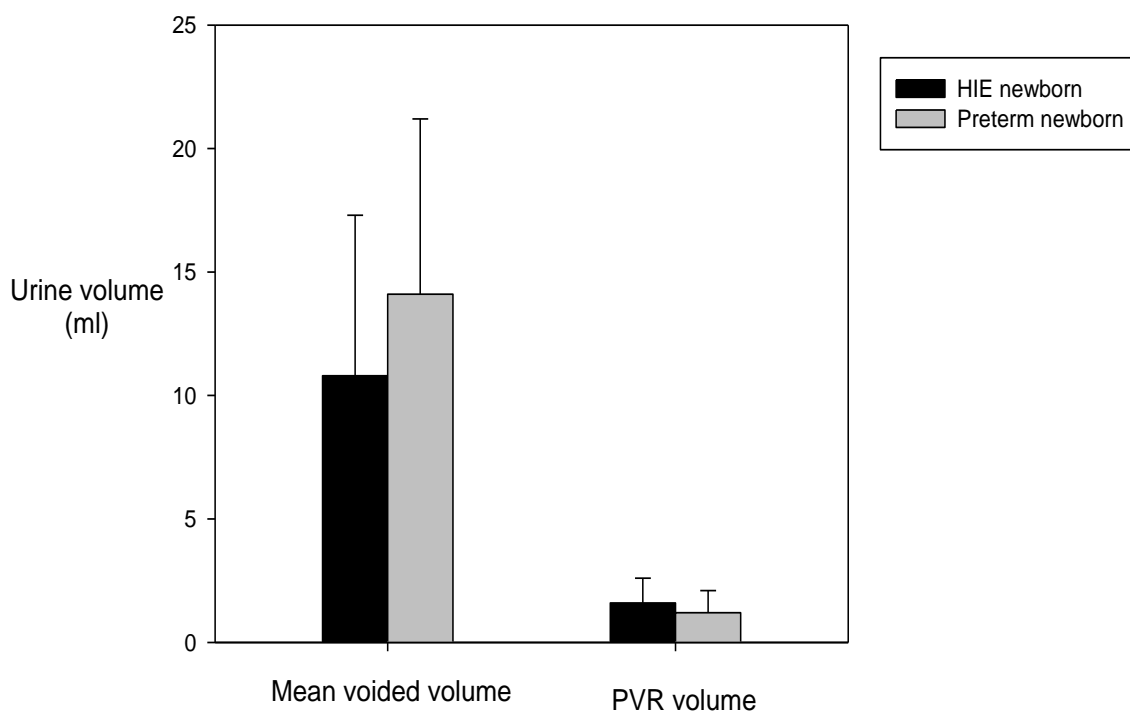


Fig.1 – Comparison of mean voided volume and PVR volume between 21 HIE neonates and 19 preterm newborns

Table 1. 4-hour voiding observation in preterm newborn with and without HIE (Mean±SD)

	Newborns with HIE (n=21)	95% CI	Newborns without HIE (n=19)	95% CI	p value
Gender					0.8063
Male	14		11		
Female	7		8		
Born after completed weeks of gestation (wk)	33.4±1.7	32.6-34.2	33.4±1.9	32.7-34.5	>0.9999
Age (d)	7.7±4.1	5.8-9.6	7.5±4.6	5.3-9.7	0.8852
Birth weight (kg)	2.0±0.6	1.7-2.3	2.0±0.4	1.8-2.2	>0.9999
Voided volume (ml)	10.8±6.5	9.3-12.2	14.1±7.1	12.3-15.9	0.0044
PVR volume (ml)	1.6±1.0	1.4-1.8	1.2±0.9	1.0-1.5	0.0146
No. voids	4.0±1.1	3.4-4.5	3.2±0.9	2.8-3.6	0.0165
Consciousness voiding rate (%)	16.3		57.1		<0.0001

HIE = hypoxic ischemic encephalopathy; PVR = post void residual; SD = standard deviation; CI = confidence interval

Table 2. HR, RF and EEG frequency in relation to voiding pattern in newborns with HIE

Groups		pre 30	pre 5	post 5	post 30
Newborns with HIE	HR	137±9	139±9	144±10	140±9
	bpm (%)		(1.4±0.6)	(5.1±1.2)	(2.2±0.8)
	RF	34±5	32±4	31±5	34±4
	bpm (%)		(-8.4±1.8)	(-9.1±3.1)	(-2.1±2.7)
	EEG frequency	1.4±0.1	1.4±0.1	1.4±0.1	1.5±0.1
	Hz (%)		(0.0±0.0)	(0.0±0.0)	(0.0±0.0)

HR = heart rate; RF = respiratory frequency; EEG = electroencephalographic; HIE = hypoxic ischemic encephalopathy