

Clinical and biochemical profile of asphyxiated preterm and full-term newborn at tertiary care hospital - A prospective observational study.

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Abstract

Background: Perinatal asphyxia refer to a condition during pregnancy and labour in which impaired gas exchange lead to fetal acidosis, hypoxemia, hypercarbaria. There is sodium, potassium, calcium, liver enzymes and renal parameters are affected in both preterm and term newborns.

Aims: To study the clinical and biochemical profile in preterm and full-term newborn with birth asphyxia.

Material and methods

Setting: Department of Pediatrics, Kamala Raja Hospital, G.R. Medical College Gwalior.

Study design: Prospective observational study.

Sample size: Total 350 newborns

Duration: Two years

Statistical analysis: SPSS software.

Results and conclusion: 350 newborns were sampled and screened within 24 hrs. and after 48 hrs. Preterm births 46(13.1%), male were 26(7.2%) and female were 20(5.7%) and 304(86.8%) were term, male were 215(61.4%) and female were 89(25.4%). Biochemical measures were done for serum sodium, hyponatremia was common in both term and preterm baby within 24 hrs. hyponatremia were also reported significantly in both preterm and term babies within 24 to 48 hrs. hyperkalemia was maximum in term and preterm of male and female babies within 24 hrs followed by hypokalemia in both preterm and term male and female both. hyperkalemia was also reported in both preterm and term male and female within 24 hrs to 48 hrs and hypokalemia were reported only in term babies, not in preterm.

Hypocalcemia was reported in preterm male and female within 24 hrs. hypocalcemia were also reported in both term and preterm of both male and female within 24 hrs. to 48 hrs.

In present study serum SGOT, serum SGPT were raised within 24 hrs. and also within 24 hrs. to 48 hrs. in both preterm and term of male and female groups.

Keywords: Hypocalcemia, hypokalemia, hyponatremia, hypernatremia

Introduction

Birth asphyxia is defined as the presence of hypoxia, hypercapnia, and acidosis leading to systemic disturbances in the newborn. Normally hypernatremia is expected in the early neonatal period as there is contraction of extracellular fluid due to excretion of water through kidney and high insensible water loss whereas in neonates with perinatal asphyxia there might be hyponatremia as there is increased secretion of anti-diuretic hormone (ADH) in neonates with HIE which leads to increased water retention and hence dilutional hyponatremia.

The other reason for hyponatremia is that the capacity of sodium reabsorption is limited and if the load of sodium reaching the Collecting Tubules (CT) increases significantly, reabsorption does not occur proportionately and the sodium load is excreted in the urine. Other contributing factors to hyponatremia is partial resistance to aldosterone.

In newborns there is hyperkalemia in early neonatal period due to shift of potassium from the intracellular to extracellular space.

In normal newborn total calcium concentration in cord plasma increases with increasing gestational age and is significantly higher than paired maternal values. With the abrupt termination of calcium transport across the

placenta at delivery, plasma calcium falls, reaching a nadir at age 24–48 h. Serum parathyroid hormone (PTH) increases postnatally in response to this fall in plasma calcium concentration. This increase in PTH mobilizes calcium from bone, and plasma calcium concentration rises and subsequently stabilizes even in the absence of exogenous calcium intake. Clinically significant hypocalcemia occurs in asphyxiated newborns. The etiology behind this is a sluggish response in PTH secretion to the postnatal fall in plasma calcium concentration.

Aims and objectives

Aim

1. To study the clinical and biochemical profile in preterm and full-term newborn with birth asphyxia.

Objectives

1. To find out association of dyselectrolytemia with severity of birth asphyxia.
2. To study the biochemical parameters within 24 hrs. and also 24 hrs. to 48 hrs. of birth asphyxiated babies.

Material and methods

Setting: Department of Pediatrics, Kamala Raja Hospital, G.R. Medical college Gwalior.

Study design: Prospective observational study.

Sample size: Total 350 newborns

Duration: Two years

This prospective observational study was conducted in the Department of Paediatrics Kamala Raja hospital Gwalior during a study period of two years in asphyxiated preterm and full-term newborns and a total of 350 cases were enrolled in the study.

Inclusion criteria

- Asphyxiated group - Term and preterm babies with APGAR scores of < 7 at 5minutes.

Exclusion criteria

- Babies with gross congenital malformations.
- Suspected metabolic diseases, cases receiving medications except vitamin K prior to collection of blood samples.
- Those born to mothers with diabetes mellitus, mothers on antiepileptic, mothers with suspected or confirmed electrolyte abnormalities were excluded from the study.
- Not giving consent were also excluded from the study

Methods

This is a hospital based prospective observational study. Consecutive sampling method was used for collection of sample. APGAR score <7 at 5 min was taken after birth and cases were selected applying inclusion and exclusion criteria. Sample collected within 24 hrs. and 48 hrs. Serum biochemistry (sodium, potassium, calcium, urea, creatinine, SGOT, SGPT) were analyzed using ion selective electrode by automated machine.

Analysis of variance (ANOVA) had been used to find the significance of study parameters between three or more groups of patients. Chi-square/Fisher Exact test had been used to find the significance of study parameters on categorical scale between two or more groups.

Observation and results

Out of 350 neonates, preterm were 46 (13.1%). preterm male were 26(7.2%) and females were 20(5.7%) and 304(86.8%) were term. Out of 304, male were 215(61.4%) and female were 89(25.4%).

Out of 350, Hindu were 323(92.3%) and Muslim were 27(7.7%). out of 323 Hindu, term babies were 278 (91.4%) and preterm were 45(97.8%).out of 27 Muslim, 26(8.6%) were term and 1 (2.2%) was preterm.

Out of 350 newborns, the occupation of their fathers were as follows: 160(45%) were skilled worker, clerical; shop-owner; farmer 96(27.4%),37(10.5%) semi-skilled worker,46(13.1%) unemployed and no cases of profession and semi-profession. The p value is insignificant.

Out of 350,276(78.8%) cases were of lower upper lower class,60(17.1%) were of lower class,12(3.4%) cases middle lower middle, 2(.005%) upper middle and no cases of upper middle were found.

Out of 350 cases, term babies were 304.out of 304,215 male and 89 female. Out of 215 male,68(31.6%) were of grade I,102(47.4%) of grade II and 45(20.9%) cases of grade III. out of 89 term female, 31(34.8%) cases were of grade I ,44(49.4%) cases of grade II,14(15.7%) cases of grade III.

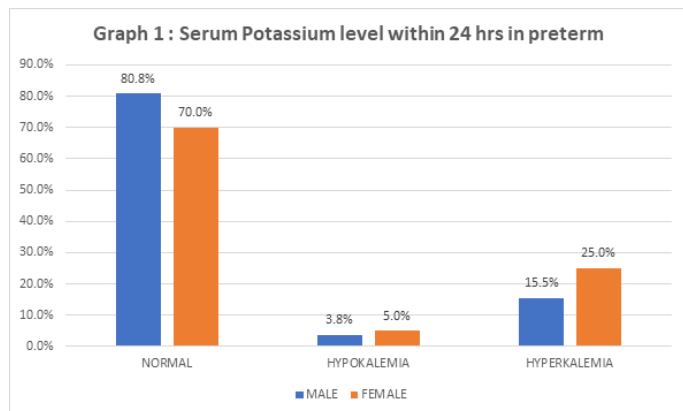
Out of 350 cases,46 were preterm newborn. out of 46 ,26 were male and 20 were female. Out of 26 male ,10(38.5%) cases of grade I,10(38.5%) cases of grade II and 6(23.1%) cases of grade III. out of 20 females preterm,4(20.0%) cases grade I,14(70.0%) cases of grade II and 2(10.0%) cases of grade III.

Out of 46,26 were preterm male. Out of 26 preterm male, serum sodium level was normal in 12(46.2%) cases, serum sodium level was less (hyponatremia) in 14(53.8%) cases and no cases of hypernatremia.

Out of 20 preterm female, sodium level was normal in 9(45%) cases, 11(55%) cases of hyponatremia and no cases of hypernatremia. The p value is insignificant.

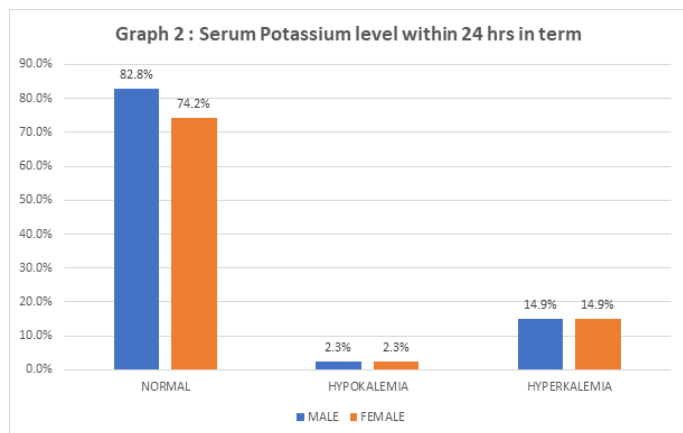
Out of 215 term male, serum sodium level was normal in 92(42.8%) cases, Serum sodium level was less (hyponatremia) in 122(56.7%) cases and 1(.5%) case of hypernatremia.

Out of 89 term female, serum sodium level was normal in 34(38.2%) cases, 55(42.8%) cases of hyponatremia and no cases of hypernatremia. The p value is insignificant.



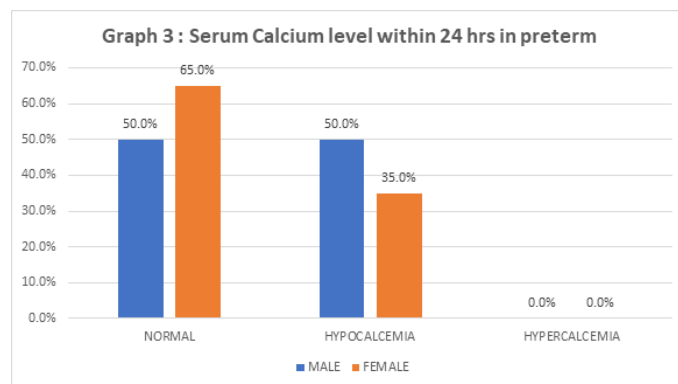
Out of 350 cases, 46 were preterm newborn. Out of 46,26 were preterm male. Out of 26 preterm male, serum potassium level was normal in 21(80.8%) cases, Serum potassium level was less (hypokalemia) in 1(3.8%) case and 4(15.45%) cases of hyperkalemia.

Out of 20 preterm female, serum potassium level was normal in 14(70.0%) cases,1(5.0%) case of hypokalemia and 5(25%) cases of hyperkalemia. The p value is insignificant.



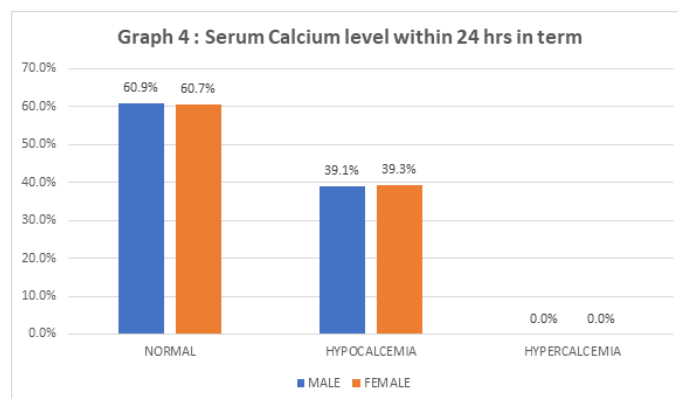
Out of 350 cases, 304 were term newborn out of 304, 215 were term male. Out of 215 term male, serum potassium level was normal in 178(82.8%) cases, Serum potassium level was less (hypokalemia) in 32(14.9%) cases and 32(14.9%) case of hyperkalemia.

Out of 89 term female, serum potassium level was normal in 66(74.2%) case, 3(2.3%) cases of hypokalemia and 20(14.9%) cases of hyperkalemia. The p value is insignificant.



Out of 350 cases, 46 were preterm newborn. Out of 46,26 were preterm male. Out of 26 preterm male, serum calcium level was normal in 13(50.0%) cases, Serum calcium level was less (hypocalcemia) in 13(50.0%) cases and no cases of hypercalcemia.

Out of 20 preterm female, serum calcium level was normal in 13(65.0%) cases,7(35.0%) cases were hypokalemic and no cases of hypercalcemia. The p value is insignificant.



Out of 350 cases, 304 were term newborn of 304,215were term male. Out of 215 term male, serum calcium level was normal in 131(60.9%) cases, Serum calcium level was less (hypocalcemia) in 32(14.9%) and no case of hypercalcemia.

Out of 89 term female, serum calcium level was normal in 54(60.7%) cases, 35(39.3%) cases hypocalcemia and no cases of hypercalcemia. The p value is insignificant.

Out of 350 cases, 46 were preterm newborn. out of 46,26 were preterm male. Out of 26 preterm male, serum SGOT level was normal in 15(57.7%) cases and Serum SGOT level was raised in 11(42.3%) cases.

Out of 20 preterm female, serum SGOT level was normal in 16(80.0%) cases, Serum SGOT level was raised in 4 (20.0%) cases. The p value is insignificant.

Out of 350 cases, 304 were term newborn. Out of 304,215 were term male. Out of 215 term male, serum SGOT level was normal in 160(74.4%) cases and Serum SGOT level was raised in 55(25.6%) cases.

Out of 89 term female, serum SGOT level was normal in 63(70.8%) cases. Serum SGOT level was raised in 26(29.2%) cases. The p value is insignificant.

Out of 350 cases, 46 were preterm newborn. out of 46,26 were preterm male. Out of 26 preterm male, serum SGPT level was normal in 15(57.7%) cases and Serum SGPT level was raised in 11(42.3%) cases.

Out of 20 preterm female, serum SGPT level was normal in 16(80.0%) cases and Serum SGPT level was raised in 4 (20.0%) cases. The p value is insignificant.

Out of 350 cases, 304 were term newborn. out of 304,215 were term male. Out of 215 term male, serum SGPT level was normal in 178(82.8%) cases and Serum SGPT level was raised in 37(18.82%) cases.

Out of 89 term female, serum SGPT level was normal in 73(82.0%) cases and Serum SGPT level was raised in 16(18.0%) cases. The p value is insignificant.

Out of 350 cases, 46 were preterm newborn. Out of 46,26 were preterm male. Out of 26 preterm male, blood urea level was normal in 25(96.2%) cases and blood urea level was raised in 1(3.8%) case.

Out of 20 preterm female, blood urea level was normal in 20(100.0%) cases and no cases of raised urea. The p value is insignificant.

Out of 350 cases, 304 were term newborn. out of 304,215 were term male. Out of 215 term male, blood urea level was normal in 212(98.6%) cases and Blood urea level was raised in 37(18.82%) cases.

Out of 89 term female, blood urea level was normal in 85(95.5%) cases and Blood urea level was raised in 4(4.5%) cases. The p value is insignificant.

Out of 350 cases, 46 were preterm newborn. Out of 46,26 were preterm male and out of 26 preterm male, serum creatinine level was normal in 20(76.9%) cases. Serum creatinine level was raised in 6(23.1%) cases.

Out of 20 preterm female, serum creatinine level was normal in 14(70.0%) cases. Serum creatinine level was raised in 6(30.0%) cases. The p value is insignificant.

Out of 350 cases, 304 were term newborn. Out of 304,215 were term male. Out of 215 term male, serum creatinine level was normal in 167(77.7%) cases and Serum creatinine level was raised in 48(22.3%) cases.

Out of 89 term female, serum creatinine level was normal in 64(71.9%) cases and Serum creatinine level was raised in 25(28.1%) cases. The p value is insignificant.

Out of 46,26 were preterm male. Out of 26 preterm male, serum sodium level was normal in 25(96.2%) cases, serum sodium level was less (hyponatremia) in 1(3.8%) case and no cases of hypernatremia.

Out of 20 preterm female, sodium level was normal in 20(100%) cases and no cases of hyponatremia and hypernatremia. The p value is insignificant.

Out of 215 term male, serum sodium level was normal in 211(98.1%) cases, Serum sodium level was less (hyponatremia) in 4(1.9%) cases and no case of hypernatremia.

Out of 89 term female, serum sodium level was normal in 88(1.1%) cases, 1(1.1%) cases of hyponatremia and no cases of hypernatremia. The p value is insignificant.

Out of 26 preterm male, serum potassium level was normal in 18(90.0%) cases, 8(30.8%) cases of hyperkalemia and no case of hypokalemia.

Out of 20 preterm female, serum potassium level was normal in 18(90.0%) cases, 2(10%) cases of hyperkalemia and no cases of hypokalemia. The p value is insignificant.

Out of 215 term male, serum potassium level was normal in 183(85.1%) cases, Serum potassium level was less (hypokalemia) in 2(0.9%) cases and 30(14.0%) case of hyperkalemia.

Out of 89 term female, serum potassium level was normal in 76(85.4%) cases, 3(3.4%) cases of hypokalemia and 10(11.2%) cases of hyperkalemia. The p value is insignificant.

Out of 26 preterm male, serum calcium level was normal in 13(50.0%) cases, Serum calcium level was less (hypocalcemia) in 13(50.0%) cases and no cases of hypercalcemia.

Out of 20 preterm female, serum calcium level was normal in 13(65.0%) cases, 7(35.0%) cases hypocalcemia and no cases of hypercalcemia. The p value is insignificant.

Out of 215 term male, serum calcium level was normal in 142(66.0%) cases, Serum calcium level was less (hypocalcemia) in 73(34.8%) and no case of hypercalcemia.

Out of 89 term female, serum calcium level was normal in 58(65.2%) cases, 31(34.8%) cases of hypocalcemia and no cases of hypercalcemia. The p value is insignificant.

Out of 26 preterm male, serum SGOT level was normal in 23(88.5%) cases and Serum SGOT level was raised in 3(11.5%) cases.

Out of 20 preterm female, serum SGOT level was normal in 17(85.0%) cases and Serum SGOT level was raised in 3(15.0%) cases. The p value is insignificant.

Out of 215 term male, serum SGOT level was normal in 195(90.7%) cases and Serum SGOT level was raised in 20(9.3%) cases.

Out of 89 term female, serum SGOT level was normal in 72(80.9%) cases and Serum SGOT level was raised in 17(19.1%) cases. The p value is insignificant.

Out of 26 preterm male, serum SGPT level was normal in 25(96.2%) cases and Serum SGPT level was raised in 1(3.8%) case.

Out of 20 preterm female, serum SGPT level was normal in 19(95.0%) cases and Serum SGPT level was raised in 1(5.0%) case. The p value is insignificant.

Out of 215 term male, serum SGPT level was normal in 201(93.5%) cases and Serum SGPT level was raised in 14(6.5%) cases.

Out of 89 term female, serum SGPT level was normal in 83(93.3%) cases and Serum SGPT level was raised in 6(6.7%) cases. The p value is insignificant.

Out of 26 preterm male, blood urea level was normal in 26(100%) cases and no cases of raised urea.

Out of 20 preterm female, blood urea level was normal in 20(100.0%) cases and no case of raised urea. The p value is insignificant.

Out of 215 term male, blood urea level was normal in 211(98.1%) cases and Blood urea level was raised in 4(1.9%) cases.

Out of 89 term female, blood urea level was normal in 88(98.9%) cases and Blood urea level was raised in 1(1.1%) case. The p value is insignificant.

Out of 26 preterm male, serum creatinine level was normal in 26(100%) cases and no cases of raised urea raised serum creatinine.

Out of 20 preterm female, serum creatinine level was normal in 20(100%) cases and no cases of raised serum creatinine. The p value is insignificant.

Out of 215 term male, serum creatinine level was normal in 215(100%) cases and no cases of raised urea raised serum creatinine.

Out of 89 term female, serum creatinine level was normal in 89(100%) cases and no cases of raised serum creatinine. The p value is insignificant.

Table 1: Biochemical parameters within 24 hrs. in pre-term and term babies.

Biochemical parameters within 24 hrs.	Group		P value
	Pre-term (n=46)	Term (n=304)	
Serum Na ⁺ (meq/l)	131.55±5.78	131.06±5.7	0.58
Serum K ⁺ (meq/l)	4.24±0.78	4.27±0.80	0.81
Serum Ca ⁺⁺ (mg/dl)	8.44±0.71	8.50±0.78	0.59
Serum SGOT (IU/l)	29.61±11.88	28.80±16.0	0.30
Serum SGPT (IU/l)	28.26±13.35	26.59±13.3	0.44
Blood Urea (mg/dl)	27.74±7.18	28.63±7.36	0.27
Serum Creatinine (mg/dl)	0.95±0.33	0.92±0.34	0.68

Out of 350,304 were term and 46 were preterm. the p value for all the biochemical parameter showed no significance in both groups.

Table 2: Biochemical parameters within 48 hrs. in pre-term and term babies.

Biochemical parameters within 48 hrs.	Group		P value
	Pre-term (n=46)	Term (n=304)	

Serum Na ⁺ (meq/l)	136.70±2.32	136.45±2.59	0.53
Serum K ⁺ (meq/l)	4.49±0.84	4.27±0.78	0.07
Serum Ca ⁺⁺ (mg/dl)	8.88±0.74	8.87±0.94	0.94
Serum SGOT (IU/l)	24.78±8.29	26.30±10.77	0.54
Serum SGPT (IU/l)	24.17±7.29	25.52±8.96	0.33
Blood Urea (mg/dl)	9.11±5.79	30.68±19.21	0.68
Serum Creatinine (mg/dl)	0.67±0.13	0.69±0.14	0.25

Out of 350,304 were term and 46 were preterm. The p value for all the biochemical parameter showed no significance in both groups.

Table 3: Association of severity of birth asphyxia with Biochemical parameters within 24 hrs.

Biochemical parameters within 24 hrs	HIE grade			P value
	Grade I	Grade II	Grade III	
Serum Na ⁺ (meq/l)	133.456	129.668	130.891	<0.001
Serum K ⁺ (meq/l)	4.2307	4.2625	4.3446	0.65
Serum Ca ⁺⁺ (mg/dl)	8.5823	8.5635	8.3194	0.158
Serum SGOT (IU/l)	28.061	28.632	31.092	0.445
Serum SGPT (IU/l)	25.535	27.836	26.338	0.33
Blood Urea (mg/dl)	28.474	28.655	28.215	0.917
Serum Creatinine (mg/dl)	0.9544	1.0366	0.8534	0.218

Out of 350 cases, the p value was significant for grade I, grade II, grade III in 24 hrs serum sodium level and for rest biochemical parameters p value is insignificant.

Out of 350 cases, the p value is significant for serum potassium and insignificant for the remaining biochemical parameter within 48 hrs.

Table 4: Overall comparison of biochemical parameters taken within 24 hrs and 48 hrs

Paired Samples Statistics						
S. No.	Biochemical parameters within 24 hrs and 48 hrs respectively	Mean	N	Std. Deviation	Std. Error Mean	P value
1.	Sodium (meq/l)	131.129	350	5.6797	0.3036	0.001
	Sodium(meq/l)	135.853	350	8.8326	0.4721	
2.	Potassium(meq/l)	4.2674	350	0.79687	0.04259	0.124
	Potassium(meq/l)	4.4977	350	2.70169	0.14441	
3.	Calcium(mg/dl)	8.5243	350	0.95674	0.05114	0.020
	Calcium (mg/dl)	9.3831	350	6.86881	0.36715	
4.	SGOT(IU/L)	28.903	350	15.7753	0.8432	0.004
	SGOT(IU/L)	26.097	350	10.4773	0.5600	
5.	SGPT(IU/L)	26.809	350	13.0735	0.6988	0.050
	SGPT(IU/L)	25.34	350	8.764	0.468	
6.	Urea(mg/dl)	28.514	350	7.3402	0.3923	0.053
	Urea(mg/dl)	30.473	350	18.0361	0.9641	
7.	Creatinine(mg/dl)	0.9758	350	0.73698	0.03939	0.001
	Creatinine(mg/dl)	0.7319	350	0.53467	0.02858	

Out of 350 cases, biochemical parameters were compared between 24 hrs and 48 hrs. It is showing p value is significant for serum sodium, serum calcium, serum SGOT and serum SGPT. p value is not significant for serum potassium and blood urea.

The biochemical parameters were compared for 24 hrs and 48 hrs. The p value is significant for serum sodium, serum calcium, serum SGOT, serum SGPT and serum creatinine. p value is insignificant for serum potassium and blood urea.

Biochemical parameters were compared. The p value is significant for serum sodium, serum calcium, serum SGOT and serum creatinine. p value is not significant for serum potassium, serum SGPT and blood urea.

Discussion

This study “Clinical and biochemical profile of asphyxiated preterm and full-term newborn at tertiary care hospital: A prospective observational study” was conducted in Special Newborn Care Unit-Kamala Raja Hospital-G.R. Medical college Gwalior, M.P from 2019-2021.

In this study 350 newborn were taken for the study. Out of 350, 304(86.85%) were term and 46(13.14%) were preterm. Out of 304, 215(61.4%) were male and 89(25.4%) were female. Out of 46 preterm, 26(7.2%) were male and 20(5.7%) were female as the study conducted by Naveed Ashraf et al¹.

Hafiz Muhammad Aslam et al² also studied higher number of cases in low socioeconomic group 62(50.4%).

The mother's occupations were reported as unemployed 159(45.4%), skilled worker 39(11.1%), semiskilled worker 38(10.87%) and clerical, shop-owner, farmer were 32(9.1%). p value is significant. This is because in our hospital most of the patient coming from the rural and urban slum area. Hence the women come in unemployed category. Tachiweyika Emmanuel et al³ conducted study on perinatal mortality showing increased risk of perinatal mortality.

Birth asphyxia grading was done in all cases. In term male newborn grade II was high in 102(47.4%) followed by 68(31.6%) grade I and 45(20.9%) in grade III. In female 44(49.4%) were grade II,31(34.8%) grade I and 14(15.7%) in grade III. In preterm male were 10(38.5%) cases of grade II, 10(38.5%) grade I and 6(23.1%) grade III. While in female 14(70.0%) in grade II,4(20.0%) grade I and 2(10.0%) in grade III. BD Gupta et al⁴ conducted study also reported more cases in grade II (28.5%). Shah GS et al⁵ also reported 45% cases of grade II followed by 33.3% in grade III and 21.7% in grade I. Biochemical parameters were measured within 24 hrs. serum sodium level in male preterm was normal in 12(46.2%) and serum sodium was low in 14(53.8%) cases. In female serum sodium level was normal in 9(45.0%) and low serum sodium in 11(55.0%) cases. no cases of hypernatremia. This clearly showing that hyponatremia is common in preterm male and female both. The p value is insignificant. Seema Shah et al⁶ also reported hyponatremia and Barzan Abdullah Hasan et al⁷ as well.

In term babies hyponatremia is common in male 122(56.7%) and 55(42.8%) female. serum sodium was normal in 92(42.8%) cases of male and 34(38.2%) of female. This also clearly showing that hyponatremia is common in term babies and p value is insignificant. Das

et al⁸ reported 65% cases of hyponatremia. Jitendra Thakur et al⁹ also reported. Serum potassium level was normal in 21(80.8%) male and 14(70.0%) female followed by hyperkalemia was found in 4 (15.45%) male and 5(25%) female followed by hypokalemia in male 1(3.8%) case and 1(5.0%) in female. Satheesh Kumar D et al¹⁰ reported 10% hyperkalemia in their study. Jitendra Thakur et al⁹ also reported hyperkalemia.

In this study serum potassium level in term baby was normal in 178(82.8%) male and 66(74.2%) in female followed hyperkalemia 32(14.9%) cases in male and 20(14.9%) in female and hypokalemia 5(2.3%) in male and 3(2.3%) in female. This clearly showing hyperkalemia is more common in term babies. Acharya A et al¹¹ reported hyperkalemia in more number of cases in grade III birth asphyxia patient. Seema Shah et al⁶ also reported hyperkalemia in 37.9% cases.

In preterm male the serum calcium was normal in 13(50.0%) and 13(50.0%) cases in female were also normal. low calcium level was reported in 13(50.0%) preterm male and 7(35.0%) female. the p value is insignificant. Pal lab Basu et al¹² reported hypocalcemia in more number of cases. Barzan Abdullah et al⁷ also.

Serum calcium level was normal in 131(60.9%) of term male and 54(60.7%) in female while hypocalcemia was reported in 84(39.1%) cases in male and 35(39.3%) cases in female. Yadav R et al¹³ reported hypocalcemia in 41.6% cases.

Liver function test-serum SGOT were raised in preterm male in 11(42.3%) cases and 4(20.0%) in female while in term 55(25.6%) cases were having raised serum SGOT in male and 26(29.2%) of female.as Mukesh Choudhary et al¹⁴.

In this study blood urea was raised in preterm male 1(3.8%) and no cases of female while in term 3(1.4%)

cases of male and 4(4.5%) cases of female urea was raised.

Serum creatinine in 6(23.1%) preterm male and 6(30.0%) preterm female while in term serum creatinine was raised in 48(22.3%) male and 25(28.1%). this clearly showing that blood urea and serum creatinine was raised in both preterm and term babies. Girijanand Jha et al¹⁵ also reported.

The biochemical parameters were also assessed within 48 hrs, serum sodium level was normal in 25(96.2%) cases of preterm male and 20(100%) cases of preterm female. Hyponatremia was reported in 1(3.8%) case in male and no cases of hyponatremia in female preterm while in term hyponatremia was reported in 4(1.9%) of male and 1(1.1%) case of female. 211(98.1%) of term male in which serum sodium level was normal while in 88(98.9%) cases of term female serum sodium level was normal also reported by K E Odo et al¹⁶.

In this study serum potassium level was normal in 18(90.0%) cases of male preterm and 18(90.0%) cases of female preterm followed by 8(30.8%) cases of hyperkalemia in male and 2(10%) cases in female and no cases of hypokalemia noted.

Serum Potassium level was normal in 183(85.1%) male and 76(85.4%) cases of females. hyperkalemia was noted in 30(14.0%) in male and 10(11.2%) cases in female and 2(0.9%) of hyperkalemia in male and 3(3.4%) cases in female. Kayode, Adebami et al¹⁷, Kavya M. et al¹⁸, Pal lab Basu et al¹².

In preterm male hypocalcemia was reported in 6(69.2%) cases and female 7(35.0%) cases while in the term 73(34.0%) in male and 31(34.8%) in the female Seema Shah et al.

Serum SGPT was raised in majority of cases as reported by Mukesh Choudhary et al.¹⁴, Baibhav Prakash et al¹⁹ also reported significant number of cases.

The serum creatinine level was normal in preterm male and female. In term newborn, 215 male cases there was no case of raised serum creatinine was reported. Sabzehei MK et al²⁰ also reported normal urea in most of the cases. Ananta Jayaswal et al²¹.

In present study biochemical parameters was done in preterm and term babies within 24 hrs. There was no significant difference was found in all group. The p value is significant.

Biochemical parameters was done in 24 hrs to 48 hrs in preterm and term babies and they were compared and no significance difference was found, p value is insignificant.

The study on biochemical parameters was done according to severity showing hyponatremia in all grades of birth asphyxia. The p value was significant as Azmeri et al²² also reported in all cases of birth asphyxia.

Biochemical parameters were also assessed within 48 hrs the serum potassium level was reported to be deranged in all grades of HIE. The p value is significant as also reported by Pal lab Basu et al¹² and B D Gupta et al¹⁴.

Overall comparisons of biochemical parameters were done for 24 hrs and 48 hrs. the p value was significant for serum sodium, serum calcium, serum SGOT, serum SGPT and serum creatinine.

In present study biochemical parameters were assessed for preterm babies within 24 hrs and 48 hrs showing significance (p value <0.05) for serum sodium, serum calcium, liver enzymes and serum creatinine. This clearly showing that these parameters were deranged.

Conclusion

Out of 304(86.85%) term, 215(61.4%) were male and 89(25.4%) were female. Out of 46(13.14%) preterm, 26(7.2%) were male and 20(5.7%) were female.

Biochemical measures were done for serum sodium, hyponatremia was common in both term and preterm baby within 24 hrs. hyponatremia were also reported significantly in both preterm and term babies within 24 to 48 hrs. hyperkalemia was maximum in term and preterm of male and female babies within 24 hrs followed by hypokalemia in both preterm and term male and female both. hyperkalemia was also reported in both preterm and term male and female within 24 hrs to 48 hrs and hypokalemia were reported only in term babies, not in preterm.

Hypocalcemia was reported in preterm male and female within 24 hrs. hypocalcemia were also reported in both term and preterm of both male and female within 24 hrs to 48 hrs.

In present study serum SGOT, serum SGPT were raised within 24 hrs and also within 24 hrs to 48 hrs in both preterm and term of male and female groups.

Blood urea and serum creatinine were raised within 24 hrs in both preterm and term of male and female groups. Within 24 hrs to 48 hrs blood urea is not raised in preterm. Raised only in term male and female groups. Serum creatinine level was not raised in both preterm and term newborn.

Comparisons of biochemical parameters within 24 hrs. to 48 hrs in preterm babies, serum sodium, serum calcium, serum SGOT, serum SGPT and serum creatinine were significant in comparison.

Comparisons of biochemical parameters within 24 hrs. to 48 hrs. in term newborn, serum sodium, serum calcium,

serum SGOT, serum SGPT and serum creatinine were significant.

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