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STUDY OF MORBIDITIES RELATED TO HIGH RISK NEW BORN

Pediatrics

KEYWORDS: Cerebralpalsy, Developmental delay, High risk clinic, Morbidities

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ABSTRACT

Aims and objectives: To assess various morbidities in high risk newborn by various screening methods and to intervene early.

Study design: Prospective analytical study performed at High Risk Clinic, Tertiary care center, civil hospital Ahmedabad, department of pediatrics

Results: Maximum number of patients in my study belongs to 0-6 month age group(29.6%). 40% had gestational age >37wks and 36.11 % had birth weight 2-2.5 kg. 21.11% had history of severe birth asphyxia with among them 47.3% had HIE grade II, 42.1% developed developmental delay and 13.1% developed cerebral palsy. Hearing defect was present in 18.33% with most common cause being birth asphyxia 39.39% followed by meningitis(24.2%). 24.44% developed ROP in which 58% belongs to gestational age <32 weeks with most common cause being prematurity followed by oxygen therapy. Out of all, 37.7% had developmental delay and 21.1% developed cerebral palsy(most common cause being prematurity). Among the patients with cerebral palsy, 52.6% developed epilepsy.

Conclusion: Appropriate and comprehensive follow up program for high risk infants helps in early detection and management of morbidities and ensure intact survival.

INTRODUCTION

The high-risk neonate is defined as a newborn, regardless of gestational age or birth weight, who has a greater-than average chance of morbidity or mortality, usually because of conditions or circumstances superimposed on the normal course of events associated with birth and the adjustment to extra uterine existence[1].

New born who are assessed in the high risk clinic are with the following criteria[2]

1) BW< 1.5 kg
2) Gestational age <32 weeks
3) Sever birth asphyxia
4) Neonatal seizure
5) Meningitis
6) Symptomatic hypoglycemia or hypocalcaemia
7) IVH
8) Neonatal jaundice with serum bilirubin >20mg/dl or exchange transfusion done,
9) CPAP or mechanical ventilation given for >48 hours,
10) Major congenital malformation or congenital TORCH infection or genetic disorder or inborn error of metabolism

High risk new born should be assessed on a regular basis to identify the future morbidities so that early intervention can be done. High risk follow up is also required to train the parents regarding identification of the problems and the delay in development on their own. My study is conducted to identify the morbidities in high risk new born so that early intervention can be taken to lessen the morbidities.

Materials and methods:

Setting: Tertiary care center, high risk clinic, department of pediatrics, civil hospital, Ahmedabad

Type of study: Prospective analytic study

Inclusion criteria: All high risk new born between the age group 0-2 years who were admitted in NICU with the high risk criteria during the time period of November 2015 to November 2016.

Aims and objectives:

1) To assess neurosensory development
2) To assess retinopathy of prematurity
3) To assess the hearing impairment
4) To find out incidence and morbidities of cerebral palsy.

Exclusion criteria: 1) All who lost follow up after 1 month
2) All who visited at irregular interval

My study is conducted during follow up in high risk clinic. Very low birth weight babies are assessed every week till 40 weeks of gestational age and then every 2-3 wks as per the requirement of the child. Denver assessment scale (DDST) Denver II is used for identifying the developmental delays. USG brain, BERA, MRI brain, ROP screening done as and when required. Head circumference, weight and total length recorded in each and every visit and compare with previous one to assess the growth of the child. Corrected gestational age was use for assessing neurosensory development. Tone of the child was assessed to assess the motor delay.

USG brain was done in all pre terms and all the patients in whom indicated, before discharge on day 3, 7 and 4 weeks of life and those with some positive finding were repeated at the age of 40 weeks for further changes.

ROP screening was done in ophthalmology institute in civil hospital. Preterm <34 weeks and all with BW< 1500 grams were screened at the age of 14 days before discharge from NICU and those who became positive were screened at regular interval for laser therapy and anti VEGF therapy.

For assessing the hearing impairment and those with risk of hearing loss, OAE was done at the age < 3 month and at the age of 3 months BERA was done. Those with hearing defect detected went for intervention before the age of 6 month to optimize language development. All infants with risk of hearing defect were undergone hearing test even if no defect detected on screening test.

MRI rain was done according to the requirement during follow up.

RESULTS

Total number of high risk new born with in the period of 1 year in my study were 180 with 101(56.11%) being male child and 79(53.89%) being female child.

TABLE 1: Age distribution:

AGE GROUP	No. of PATIENTD (n=180)	PERCENTAGE
0-6 months	52	29.6%
>6-12 months	50	28.33%
>12-18 months	37	20.6%
>18-24 months	41	21.47%

Maximum no of children were in the age group of 0-6 months (29.6%) followed by 6-9 months.

TABLE2: Distribution according to birth weight and gestational age

Gestational age at birth	>2.5 kg	2- 2.49 kg	1.5 – 1.99 kg	1-1.5kgs	< 1 kg
>37wks	25	40	07		
34- 36wks		25	16		
32-34wks			18	28	
30-32wks				21	2
28-30wks					2

Maximum no. of patients were with birth weigh 2- 2.5 kg (36.11%) with gestational age >37 weeks (40%).

TABLE3: Distribution of birth asphyxia grading with gestational age

SBA GRADING	HIE grade I	HIE grade II	HIE grade III
>37wks	5	11	6
34-36wks	4	5	1
< 34wks	3	2	1

21.11% were with the history of birth asphyxia with 57% among them with gestational age >37 weeks and 43% with <37 weeks.
42.1% of the children with birth asphyxia had developmental delay. Among the patients having severe birth asphyxia, 21.05% children had HIE grade III and 47.36 had HIE grade II.

TABLE4: Hearing defect with respect to etiologies

CAUSES	No. of patients(N=33)	PERCENTAGE
Birth Asphyxia	12	39.39.%
Prematurity	6	18.18%
Hyperbilirubinemia	3	9.7%
Meningitis	08	24.27%
Congenital anomaly	02	6.06%
IVH	02	6.06%

Hearing defect present in 18.33% patients, most common cause for hearing defect was birth asphyxia (39.39%) followed by meningitis (24.27%).

TABLE5: Risk factor for ROP

RISK FACTORS	PERCENTAGE
Preterm	100%
O2 therapy	89.85%
Sepsis	79.6%
Blood transfusion	27.11%
Apnea of prematurity	40.6%
Poor weight gain	22.03%
IVH	3.38%

24.44% patients developed retinopathy of prematurity with 58% belongs to gestational age <32 weeks, most common risk factor being prematurity (100%) followed by oxygen therapy (89.85%) and sepsis (79.6%).

TABLE6: Stages of ROP in relation to gestational age

STAGE	1	2	3	4	5	Aggressive posterior
<32wk 58%	09	4	4	2	1	1
32-34wk 42%	10	5	3	2	2	1

TABLE7: Outcome of ROP with treatment

	Spontaneous resolution	Required laser	Required anti VEGF treatment
Stage 1	09		
Stage2	08	02	
Stage3		05	2
Stage4		2	2
Stage5			3

100% with stage I ROP and 80% of stage II had spontaneous resolution. 27.2% of total ROP cases required laser therapy and 21.2% required anti VEGF therapy.

TABLE8: Developmental outcome with special reference to high risk factors

HIGH RISK FACTORS	DEVELOPMENTAL DELAY(n =68)
Severe birth asphyxia	16(23.5%)
Preterm <32 weeks/ Birth weight <1.5 kg	22(32.35%)
Neonatal seizures	06(08.8%)
Meningitis	10(14.8%)
Symptomatic hypoglycemia & hypocalcaemia	7(10.2%)
Intra ventricular haemorrhage	02(2.9%)
TORCH Infection	02(2.9%)
Kernicterus	03(4.41%)

37.7% had developmental delay, most common cause being prematurity (32.53%) followed by birth asphyxia (23.5%).

TABLE9: Etiologies leading to cerebral palsy

CAUSES	n=38
Birth asphyxia	5
Meningitis	2
Kernicterus	3
Preterm	14
IVH	2
Neonatal seizure	3
Congenital hydrocephalus	3
Metabolic disorder	2
TORCH infection	2

21.1% developed cerebral palsy. Most common cause was prematurity (36.8%) followed by birth asphyxia (13.1%).

TABLE10: MORBIDITIES OF CEREBRAL PALSY

MORBIDITIES	Number of patients(n=38)
Epilepsy	20
Speech problem	14
Respiratory tract infection	8
Behavior problem	3
Feeding difficulties	9
Hearing defect	5
Visual defect	7

Common Morbidities in cerebral palsy were epilepsy in 52.6%, speech problems(36.84%) and feeding difficulty(23.68%).

DISCUSSION

In my study maximum number of follow up belongs to age group 0-6 months age group (29.6%) as compared to study conducted by Nandita chattopadhyay et al maximum no were of age group 12-18 month.

42.1% of the children with birth asphyxia had developmental delay. Among the patients having severe birth asphyxia, 21.05% children had HIE grade III and 47.36 had HIE grade II.Birth asphyxia with HIE grade III having higher degree of morbidities leading to developmental delay, hearing defect, epilepsy repeated respiratory tract infection.

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Hearing defect in my study in 18.33% patients as compared to study conducted by Manju et al incidence was 16.36%. Most common cause in my study being birth asphyxia (39.39%) followed by meningitis (24.27%) followed by prematurity (18.18%). Patients with late onset sepsis with history of top feeding leads to meningitis which caused hearing defect and also hydrocephalus in 4 patients[3,4].

24.44% patients developed ROP in my study as compared to Hakeem et al had ROP in19.18% patients. 58% with ROP belongs to gestational age <32 wks where as in Hakeem et al 45.8% belongs to gestational age <32 wks.

Risk factor for ROP most common being prematurity (100%), prolonged o2 therapy (89.85%), sepsis (79.6%) followed by apnea of prematurity(40.6%). Study conducted by Hakeem et al 66.7% with ROP required O2 therapy. Other risk factors for ROP were hypoglycemia, blood transfusion[5,6].

In my study 37.7% children had developmental delay as compared to similar study conducted by Nandita chattopadhyay 32.08% had developmental delay[7]. Most common cause in my study was prematurity (32.53%) followed by birth asphyxia (23.5%).

21.1% developed cerebral palsy with 57.8% with age group 1-2 yr. Most common cause was prematurity(36.8%) followed by birth asphyxia(13.1%). 2 children with history of IVH both developed cerebral palsy and 3 patient with exchange transfusion with kernicterus all developed cerebral palsy.

In my study morbidities among the children with cerebral palsy were epilepsy 52.6%, microcephlay57.8%, hearing defect 13.1%, visual defect 18.4%. similar study conducted by Nabanita Das among cerebral palsy, morbidities in the above sequence were 48%,56%,18%,23% which was similar to my study.

All childen with IVH had developed ROP stage III, hearing defect, developmental delay.

3 children with kernicterus developed developmental delay, hearing defect.

CONCLUSION

Improvement in perinatal-neonatal care has led to increased survival of newborns who are at high risk of post discharge morbidities. The morbidities include growth failure, neurosensory impairment and developmental deficit along with the ongoing medical illness.

An appropriate and comprehensive follow up program for high risk infants will help early detection and management of any morbidity associated with perinatal events, and shall ensure not only intact survival and optimum growth but also an optimum quality of life for these infants.

Acknowledgement

"Nothing worthwhile was ever achieved without will to start, the enthusiasm to continue and the persistence to Complete".

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