ORIGINAL ARTICLE

To Study the Prevalence of Intraventricular Heamorrhage in Preterm Infants

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ABSTRACT

Objective: To recognize various prenatal and postnatal risk factors for IVH in preterm infants and find out proportion of preterm infants developing this complication in neonatal unit of Fatima Memorial Hospital, Lahore.
Study design: Hospital based study done in one year period between Jan 2001 to Dec 2001.
Background: Intraventricular hemorrhage is defined as the presence of blood within the ventricle or in the germinal matrix, which is just below the ependymal lining of d cross sectional study**.**
Setting: Neonatal unit Fatima Memorial Hospital Lahore.
Sample size: 100 preterms were included in the study.
Methods:100 preterm newborns born consecutively in a period of one year were included in this study. History was recorded on a proforma and various prenatal and perinatal risk factors for developing IVH were noted. Each preterm under went a cranial ultrasound between 3rd to 7th days of life.
Results: Out of total, 13% n=13 developed IVH. The grading of IVH showed that 30%had grade1,9% had grade 2,46% developed grade3 and 155 developed grade4 hemorrhage**.**
Conclusion: IVH is one of the major problems encountered by the preterms and anticipation and early detection of risk factors can reduce the incidence of this problem.
Key words: PV-IVH (periventricular-intraventricular hemorrhage), PROM (premature rupture of membranes, preterm infant**.**

INTRODUCTION

IVH is a common complication faced by the preterm infants[1].Although with the advanced and improved neonatal care the survival rate of preterms has markedly improved but IVH still poses a profound threat to the neurodevelopment of these tiny survivors. Papile classified IVH into four grades on the bases of cranial ultrasound findings[2].This was later modified by Rumack and Jhonson[3] and Volpe[4] further simplified the grading system as follows:
GRADE 1: Isolated subependymal (germinal matrix) hemorrhage with no IVH.
GRADE 2: IVH occupying 10-50% of ventricular area in the parasagittal view.
GRADE 3: IVH occupying more than 50% of the ventricular area.
GRADE 4: Severe IVH with periventricular echodensity.

The incidence of IVH is inversely related to the birth weight of the preterm infants i.e;60-70 % in infants weighing 500-750gms and 10%-20% amongst those weighing 1000-1500gms. IVH is rarely present at birth,however 80-90% cases occur between birth and 3rd day of life ,out of these 50% occur on the 1st .20-40% cases progress in severity and the rest either remain static or got better .Delayed hemorrhage may occur in 10-15 % of patients after 1st week of life[5].

The risk factors associated with IVH include both prenatal and perinatal factors. The prenatal factors associated with increased risk of IVH include male gender,maternal age <20 years and primigravida mother.

The perinatal factors which were studied included antenatal steroids administration, antenatal tocolysis antepartum hemorrhage, cord prolapse ,presentation of baby, need for resuscitation, mode of delivery, premature rupture of membranes, weight for gestational age, birth asphyxia and hyaline membrane disease in infants.

Many studies have been done regarding frequency, risk factors associated and outcome of premature infants who develop IVH internationally. It is still a major and relatively less studied problem and insufficient data is available in Pakistani journals.

MATERIAL AND METHODS

The subjects of this study were preterm infants delivered below 37 weeks of gestation. The objective of the study was to find the frequency of IVH and to look for prenatal and perinatal factors associated with

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IVH. All the babies from birth to 28 days of life were included in the study. IVH was labeled on the bases of cranial ultrasonographic evidence of bleed in the cerebral ventricles.

These preterm neonates were examined clinically at the time of admission in the nursery and there weight and head circumference were recorded and were followed on daily bases. vital signs were monitored .the routine laboratory investigations which were performed on all the subjects were complete blood count, ESR, CRP, blood sugar random, blood culture and sensitivity, urine examination and culture .Besides these other investigations like chest x rays were also performed as and when needed. Cranial ultrasound was performed on all neomates routinely on 7th day of life, and earlier if clinical condition demands so. It was repeated after 3 days and then on weekly bases in those with evidence of IVH. The data was collected on a proforma. The results were analysed on SPSS11.

RESULTS:

In this study overall prevalence of IVH was 13/100 (13%).Grading of IVH showed that 4/100 (30.76%) had grade1 hemorrhage,1/100(7.7%) had grade 2,6/100(46.2%) had grade 3 and 2/100 (15.4%) had grade IVH.

Table 1. Frequency according to grades of IVH.

Grades of IVH	**n=**	**%age**
Grade 1	4	30.76
Grade 2	1	7.69
Grade 3	6	46.15
Grade 4	2	15.38
	13	13

Table 2: Distribution of cases according to birth weight.

Weight	**n=**	**n= with IVH**	**%age**
<1000 GMS	10	1	10
1000-1500 GMS	44	8	18.18
1500-2000 GMS	33	3	9.9
>2000 GMS	13	1	7.69

The study group also developed other complications like birth asphyxia noted in 12 babies(12%),neonatal sepsis occurred in 23 babies(23%),respiratory distress syndrome(RDS) in 20,neonatal seizures in 4,jaundice developed in 20 and congenital heart disease in 2 preterm babies.

Table 3: Complications seen in premature infants.

Clinical diagnosis	**n=**	%age
Birth asphyxia	12	12
Neonatal sepsis	23	23
Resp. dist. syndrome (RDS)	20	20
Neonatal seizures	4	4
Jaundice	20	20
Congenital heart disease	2	2
None except prematurity	6	6
PIVH	13	13

Prenatal risk factors studied showed a slightly more prevalence in male babies as compared to female babies i.e.,13.2%:12.76%, it was more common amongst primigravida and <20 years old mothers.

Table 4. Prenatal risk factors for IVH.

Prenatal risk factors	**n= 100**	**n= with IVH**	**%age**
Male	53	7	13%
Female	47	6	12%
Age of mother			
>20yrs	7	1	14%
21-30yrs	63	10	16%
>30 yrs	30	2	7%
Gravidity			
Primgravida	27	6	22%
2-4 gravida	54	5	10%
multigravida	19	2	11%
Antenatal visits			
Yes	86	5	6%
No	14	8	57%
Gestational diabetes			
Yes	10	1	10%
No	90	13	13%
PIH			
Yes	23	2	9%
No	77	11	14%
Eclampsia /preeclampsia			
Yes	15	3	20%
No	85	10	12%

Perinatal risk factors which were studied showed that maternal history of antepartum hemorrhage was associated with higher risk of IVH 15%.Antenatal steroids and tocolysis administered to those mothers in whom preterm delivery was anticipated were protective for babies against IVH.IVH was found to be more common amongst those neonates who had breech presentation,delivered by assisted vaginal delivery and in those whose mother had premature rupture of membranes(PROM).

Table 5: Perinatal risk factors for IVH.

Perinatal risk factors	n=	n= with IVH	%age
Antepartum hemorrhage			
Yes	20	3	15
No	80	10	12
Antenatal steroids			
Yes	73	5	7
No	27	8	30
Antenatal tocolysis			
Yes	63	6	10
No	37	7	19
Presentation			
Cephalic	85	9	11
Breech	15	4	27
Need for resuscitation			
Yes	33	9	27
No	67	4	6
Mode of delivery			
SVD	57	7	13
Assist .vaginal	20	4	20
C. Section	23	2	9
PROM			
Yes	24	4	17
No	76	9	12
Weight for gestational age			
SGA	57	6	11
AGA	40	7	18
LGA	3	0	0
Birth asphyxia			
Yes	61	8	14
No	39	5	12
Hyaline membrane disease			
Yes	26	10	38
No	74	3	4

DISCUSSION

The overall frequency of IVH in preterm neonates is inversely related with gestational age of the infants. The total incidence of IVH in preterm infants was found to be 13% in our study. When different weight groups were considered, IVH was found to be more common amongst VLBW infants between birth weights of 1000-1500gms .This fact is also noted in some other studies as well[6,7].

It was found that primigravida mothers, women who did not have antenatal visits and in those with preeclampsia or eclampsia prevalence of IVH was higher significantly. Gender of the baby and maternal age had a less significant and gestational diabetes and PIH were rather protective factors[8].

Cranial ultrasound is a diagnostic tool of choice for diagnosis of IVH. In our study 13 cases of IVH were detected by cranial ultrasound. Similarly, Debillon et al found in their study that cranial ultrasound is a good diagnostic tool for diagnosing IVH[9].

RDS, neonatal sepsis and jaundice were the most prevalent co-morbid conditions or complications seen in preterm infants besides IVH. This fact was also observed by Coughtery et al[10].

CONCLUSION

Early identification of IVH is possible by clinical features and by cranial ultrasound. This study was a single centre study conducted on a limited scale. It is required on national and international level that large scale studies should be done to assess the frequency of IVH. It is further concluded that good prenatal, natal and postnatal care can reduce morbidity and mortality of preterm newborns.

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