

# CONTRIBUTION OF PRETERM DELIVERY TO PERINATAL MORTALITY

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## ABSTRACT

**Objective:** To review the perinatal mortality in preterm singleton births based on birth weight and gestational age at delivery.

**Material and Methods:** A retrospective review of hospital case notes of labour and perinatal mortality was carried out on all singleton preterm deliveries excluding congenital abnormalities from 28 to 37 weeks between 1<sup>st</sup> January 2001 – 31<sup>st</sup> December 2001. There were 3440 singleton deliveries over the study period of which 182 were preterm (5.2%).

**Results:** The overall perinatal mortality in the preterm group was 368/1000. The perinatal mortality fell with advancing gestational age from being 66% at 28-31 weeks, 38% at 32-33 weeks to 20% at 34-36 weeks. The perinatal mortality rate also fell with increasing birth weight from 826/1000 birth of 1-1.49 kg to 115/1000 at 1.5-2.5 kg.

**Conclusion:** This study has demonstrated perinatal mortality using gestational age and birth weight. The results will be of use in obstetric management when elective preterm delivery is considered, and for providing prognostic guidance following preterm delivery.

**Key words:** Preterm delivery, Perinatal mortality.

## INTRODUCTION

The World Health Organization defines preterm birth (PTB) as a delivery occurring at less than 37 completed weeks of gestation.<sup>1</sup> Preterm delivery and low birth weight are a major cause of both perinatal and

neonatal mortality. It also contributes to the long term disability (1.6%).<sup>2,3,4,5</sup> It is true not only for underdeveloped world but also for the industrialized countries. It is estimated that approximately 132 million preterm births occur world wide each year, from an incidence of 5.6% in Oceania to 11% in America. In Europe, 5.8% of all births are

preterm which represent around 400,000 preterm births annually.<sup>6</sup> Approximately 50% of PTB occur after 35 weeks gestation and almost all the morbidity and mortality of PTB occurs before this time. At 24 weeks gestation, perinatal mortality is nearly 80% and after 30 weeks gestation mortality falls below 10%.<sup>6,7</sup> The EPICURE study has shown that 50% of babies born before 26 weeks gestation will have some form of disability and, in 50% of these, the disability will be severe.<sup>6</sup>

Births at gestational ages of 32 through 36 weeks are much more common than births at less than 32 gestational weeks, the risks of prematurity are also much lower in these gestational ages. Because of the absence of very advance neonatal care facilities for the very premature infants, we have concentrated more on the mild and moderate preterm births which have been taken as 34 through 37 and 32 through 33 completed weeks of gestation respectively. The data is presented both by gestational age and birth weight.

## MATERIAL AND METHODS

A detailed retrospective study was made of the 182 infants delivered before the 37<sup>th</sup> completed weeks of gestation at Hayatabad Medical Complex Peshawar, from 1<sup>st</sup> January 2001 to 31<sup>st</sup> December 2001. Two data source were used for our analysis, the delivery records were observed from the labour registers. The gestational ages and births weights were confirmed from the perinatal morbidity and mortality registers. Information was also collected for the preterm infants who remained admitted in the neonatal care unit of Hayatabad Medical Complex, Peshawar.

Preterm birth was taken from 28-37 weeks and all the singleton preterm deliveries were included in the study, congenitally abnormal babies however were excluded from the data.

Gestational age was estimated from the last menstrual period and early ultrasound dating scans.

Birth weight at the time of delivery was divided into 490 gm strata and perinatal mortality was calculated for each gestational age/fetal weight group.

## RESULTS

There were 3440 singleton deliveries over the study period, (excluding congenitally abnormal babies) of which 195 were preterm. Again congenitally abnormal babies were excluded, so that 182(5.2%) preterm deliveries were included in the study. Gestational age distribution among all the births are shown in Table-1. Mild (34-37 weeks) preterm births comprised 2.81% and moderate (32-33 weeks) 0.98% of all the births.

During 2001 the perinatal mortality rate for Hayatabad Medical Complex, Peshawar was 55 per 1000. This was made up of a stillbirth rate of 47 per 1000 and early neonatal death rate of 8 per 1000. Within the preterm group there were 67 perinatal deaths giving an overall perinatal mortality rate of 368 per 1000 total births (Table-2). The percentage of perinatal mortality according to the gestational age increased from mild preterm births (20%) to highest in the severe preterms (66%) (Table-3). Prematurity con-

GESTATIONAL AGE DISTRIBUTION AMONG ALL SINGLETON BIRTHS (EXCLUDING CONG. AB)

	No	% ages
28-31 weeks	51	1.48
32-33 weeks	34	0.98
34-37 weeks	97	2.81
Term (Singleton)	3258	93.25
Total (Singleton)	3440	

TABLE - 1

## PERINATAL MORTALITY AT HAYATABAD MEDICAL COMPLEX IN YEAR 2001

Gestational age	Still births	Early neonatal	Perinatal deaths	PNMR/1000
No. of infants without what abnormalities				
< 37 weeks 182	51	16	67	368
> 37 weeks 3258	112	12	123	38
Total 3440	162	28	19	
Rate per 1000 total births	47	08	55	

TABLE - 2

tributed to 35% of the overall perinatal mortality rates.

Table-4 depicts the relationship between gestational age and birth weight. In our setup where high quality sophisticated neonatal care is lacking high perinatal as well as early neonatal mortality rates are to be expected. Of the 8 live born infants in the weight range of <1.5 kg, only 4(50%) survived in the early neonatal period. Early neonatal survival rate improved with increasing gestation as well as birth weight. 20 (71%) out of the 28 live born babies survived in the weight range of 1.5-1.9 kg all of them were 32-35 week. Survival rate was 93% (43 out of 46 live births) in infants weighing 2-2.49 kg and 97.8% (46 out of 47 live births) with weight of  $\geq 2.5$  kg.

Thus there was a sharp decline in perinatal mortality rates with increasing birth weights and gestational ages. PNM rates

were high in gestational age of  $\leq 31$  weeks and birth weight of  $\leq 1.5$  kg. Infants who had low birth weight (1.5 – 1.9 kg) but gestational age of  $> 32$  weeks had better chance of survival.

## DISCUSSION

In this study we have examined the effect on mortality of both gestational age and births weight in preterm infants. We excluded all the case of congenital abnormalities from our analysis.

In cases of preterm delivery the obstetric management is focused to prevent the spontaneous premature delivery and if the delivery is thought to be inevitable, to optimize the neonatal outcome. It is extremely important to have a good understanding of prenatal and neonatal mortality and morbidity in preterm deliveries irrespective of the fact whether it is spontaneous

### PERINATAL MORTALITY ACCORDING TO GEST. AGE AMONG SINGLETON BIRTH LESS THAN 37 GESTATIONAL WEEKS. TOTAL PRETERM 182

	28-31 weeks	32-33 weeks	34-37 weeks
Still birth	25	08	18
Early neonatal deaths	09	05	02
Total perinatal mortality	34	13	20
% of PNM	66%	38%	20%

TABLE - 3

**NO. OF PRETERM BIRTH, STILL BIRTHS, EARLY NEONATAL DEATHS AND PERINATAL MORTALITY RATES IN RELATION TO GESTATIONAL AGE AND BIRTH WEIGHT**

Gestational age (weeks)	BIRTH WEIGHT (Kgm)			
	1-1.49	1.5-1.9	2-2.49	≥2.5
28-29	03	02	02	0
30-31	15	22	06	02
32-33	03	10	13	06
34-35	02	06	34	29
36-37	0	02	07	15
Total Births	23	43	61	55
No. of Still birth	15	15	15	05
No. of early neonatal deaths	04	08	03	01
Perinatal mortality rate (per 1000)	826	534	295	109

TABLE - 4

delivery or a consequence of obstetric intervention. This is needed in order to establish the preferred mode of delivery and level of the neonatal care available.<sup>2,8</sup>

The levels of neonatal viability are different for different countries as well as different hospitals. In the Western world it is generally accepted to lie between 23 and 25 weeks gestation.<sup>7,8,9,10</sup> But for our study we have taken 28 gestational weeks as the limit of viability

Establishment of an accurate gestational age and birth weight is the key to this study. We calculated the gestational ages from their last menstrual periods and confirmed them from early ultrasound scans in case where they were available. In doubtful cases reliance was made on the early scan measurements and clinical findings. It is well established that accurate gestation is most easily obtained in the first or early second trimester by measuring embryonic or fetal crown rump length or fetal biparietal diameter.<sup>7</sup> It is however more difficult to establish gestation later in the pregnancy and great caution should be used in deriving the fetal gestation from ultrasound biometry beyond

20 weeks as this is confounded by increasing variation in fetal size.

After delivery neonatal weight is easily established by accurate weighing of the baby. Estimation of fetal weight prior to delivery, however, is more difficult and there is increasing evidence of the limitations of ultrasound for this purpose.<sup>5</sup> Yet gestational age, although more difficult to assess, may be more important for perinatal mortality than birth weight.

Out of every 20 infants born at Hayatabad Medical Complex during year 2001 one had a gestational age of less than 37 weeks. Although they represented only 5.29% of all births, these infants were responsible for 35% of all perinatal deaths and 57% of all early neonatal deaths. The incidence of premature deliveries in our study is similar to be the one which is quoted (6-10%)<sup>7,8,11,12</sup>

It has been found that perinatal mortality reduced with an increase in the gestation period and weight of the fetus.<sup>2,4,13,14</sup> The early neonatal mortality rates were closely linked to both gestational age and weight at birth. It was found that with lower birth

weights the chances of survival were better if the gestational age was  $\geq 32$  weeks.

Postponing delivery to 32 weeks would obviously considerably reduce the early neonatal mortality in our setup. This however need a full support form an neonatal intensive care unit.

## CONCLUSION

This study has demonstrated perinatal mortality using gestational age and birth weight. The results will be of use in obstetric management when elective preterm delivery is considered and for providing prognostic guidance following preterm delivery.

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