



Perinatal mortality in a referral hospital of Orissa – A 10 year review

Das Lucy, Satapathy Umakant, Panda Niharika

Department of Obstetrics and Gynecology, S.C.B. Medical College, Cuttack 753007.

OBJECTIVE(S) : To evaluate the perinatal mortality rate, its major determinants and its trend at a referral teaching hospital, and to suggest the policies to reduce it.

METHOD(S) : A retrospective study was done of perinatal mortality rate (PMR) among all the deliveries conducted from 1st April 1992 to 31st March, 2002 in our hospital. The factors responsible for the perinatal mortality were identified and its changing trend in the last 10 years was evaluated.

RESULTS : The PMR in the present study decreased from 138.23 in 1992 to 70.2 in 2002. Primiparity, low socio-economic status, poor antenatal attendance, and risk factors like pregnancy induced hypertension, antepartum hemorrhage, prematurity and birth trauma, particularly asphyxia, were the major factors responsible for perinatal mortality.

CONCLUSION(S) : Poor antenatal attendance, poverty, illiteracy, and poor referral facilities were the major factors responsible for perinatal deaths. Most of the perinatal mortality is preventable by proper antenatal care, prompt referral service, and immediate and timely institution of medical treatment.

Key words : perinatal mortality rate, referral hospital

Introduction

Perinatal mortality depicts the economic and health care progress of a country. It reflects the efficacy of Maternity and Child Health (MCH) care and hence is a sensitive indicator of the MCH care. The MCH program of India has now geared up to orient and improvise the existing available facilities. During the last few decades there has been marked reduction in perinatal deaths in developing countries including India. In spite of this, our perinatal mortality rate (PMR) is much higher than that in the developed countries. Global PMR is 49.6/1000. The present alarming perinatal mortality can be reduced by repeated periodic analysis of its magnitude and causative factors, and by making necessary efforts to rectify them. The present study was aimed at determining the exact perinatal mortality in a referral hospital, finding the

probable causes behind it, and making possible suggestions for remedy.

Methods

A retrospective analysis of the total number of deliveries conducted from 1st April, 1992 to 31st March, 2002 was done. The total number of stillbirths and of early neonatal deaths were found out, and the different rates were calculated. The PMR was calculated as the total number of stillbirths plus early neonatal deaths (within 7 days of birth) per 1000 total births. The different maternal and fetal factors involved in the perinatal mortality were tabulated and analyzed.

Statistical analysis was done by using the student t test and significance of the difference of percentages using the formula $SE = \sqrt{PQ/N}$ [P=percent occurrence, Q=(1-P). N = size of sample] and then finding out the Critical Ratio (CR) as difference in two percentages / SE.

Results

The PMR was much higher (70.2/1000) than that of the

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Correspondence :

Dr. Umakant Satapathy

Gamandia Canal Road, Buxibazar,

Cuttack 753001, (Orissa)

Tel. 0671 2417661 Email : uksatapathy@yahoo.co.uk

Table 1. Year wise perinatal mortality rate.

Year	Number of deliveries	Number of still births	Number of neonatal deaths	Perinatal mortality	PMR
1992-93	4695	450	199	649	138.23
1993-94	4470	416	165	581	129.90
1994-95	4796	412	181	593	123.60
1995-96	4975	402	163	505	113.60
1996-97	4738	379	151	530	111.90
1997-98	4771	362	142	504	105.60
1998-99	4655	365	132	497	106.70
1999-00	5286	317	138	455	86.07
2000-01	5467	297	137	434	79.38
2001-02	5540	257	132	389	70.21
Total	49393	3657	1540	5190	105.20

Table 2. Year to year comparison of PMR.

PMR of years compared	Level of significance	PMR of years compared	Level of significance
1992-93 and 1993-94	> 0.10 ^a	1992-93 and 1998-99	< 0.01 ^b
1992-93 and 1994-95	> 0.05 ^a	1992-93 and 1999-00	< 0.01 ^b
1992-93 and 1995-96	< 0.01 ^b	1992-93 and 2000-01	< 0.01 ^b
1992-93 and 1996-97	< 0.01 ^b	1992-93 and 2001-02	< 0.01 ^b
1992-93 and 1997-98	< 0.01 ^b		

^a – not significant ^b – significant

Level of significance was arrived at by comparing the observed P value with the relevant statistical t table value at infinity degree of freedom

Table 3. Profile of women.

	Number of deliveries (n=49393)	Number of still birth (n=3657)	Number of neonatal deaths (n=1540)	Perinatal mortality	PMR
A. Age (years)					
< 20	4200	216	97	213	74.52
21 – 25	26160	1569	648	2217	84.74
26 – 30	9481	870	357	1227	129.42
31 – 35	6566	666	266	932	141.94
> 35	2986	336	172	508	170.13
B. Parity					
1	19623	1785	745	2530	128.93
2	10536	541	343	884	83.90
3	10663	709	239	948	88.91
4	6052	340	99	439	72.54
≥ 5	2519	282	114	396	157.21
C. Gestational age (weeks)					
28 – 32	13251	1327	668	1995	150.55
33 – 36	14246	1101	388	1489	104.52
37 – 40	14884	787	364	1151	77.33
> 40	7012	462	120	582	83.00
D. Socio-economic status					
Low	19552	1770	721	2491	127.40
Middle	175 26	1430	599	2029	115.77
High	12315	457	220	677	54.97
E. Residence					
Rural	25746	2011	878	2889	112.29
Urban	23647	1646	662	2308	97.60
F. Antenatal care					
Un-booked	30859	2654	897	3551	115.07
Booked	18534	1003	643	1646	88.81
G. Referral					
< 50 km	22532	1431	532	1963	87.12
> 50 km	26861	2236	1008	3244	120.77

Table 4. Correlation of number of antenatal visits by the booked cases and the perinatal mortality rate.

Year	1 visit	2 visits	3 or more visits	PMR
92-93	903	541	367	138.23
93-94	904	512	353	129.9
94-95	924	565	326	123.6
95-96	816	586	387	113.6
96-97	895	630	363	111.9
97-98	886	621	392	105.6
98-99	872	599	368	106.7
99-00	806	652	432	86.7
00-01	842	679	458	79.4
01-02	784	675	396	70.2
PMR	114.57 ^a	74.59 ^a	53.26 ^a	

^a – Differences were highly significant (P <0.005).

Level of significance were arrived at by comparing the observed P value with the relevant statistical t table value at infinity degree of freedom.

Table 5. Factors causing still births.

Factors	Stillbirth
Pregnancy induced hypertention	801 (21.9)
Eclampsia	435 (11.9)
Antepartum hemorrhage	750 (20.5)
Anemia	410 (11.2)
Obstructed labor	461 (12.6)
Medical diseases	124 (1.4)
Intrauterine growth retardation	607 (16.6)
Malformation	69 (1.9)
Total	3957 (100)

Figures in parenthesis represent percentages

national average of (60/1000)¹. It was found to be highest in the year 1992-93 (138.23) which gradually declined over 10 years to 70.2 (Table 1) and the year to year decrease in PMR was significant (P<0.01) (Tables 1 and 2).

The PMR was highest in multiparous women (PMR 157.21 in parity ≥ 5) and maximum in the age group of > 35 years (PMR 170.13) (Table 3). The mortality rate was lower in women who had antenatal checkups i.e. booked cases (PMR 88.81) than in unbooked cases (PMR 115.07). Table 4 correlates the PMR with the number of antenatal visits. Maximum number of women were referred for prolonged 1st and 2nd stages of labor from distant places (>50 kms) taking longer time to reach the referral hospital causing a delay in starting the treatment. The PMR was 120.77 in women coming from areas beyond 50 kms and 87.12 in women coming from areas within 50 kms (Table 3). Majority of the women contributing to PMR were of lower socio-economic group (PMR 127.4) and were mostly rural based

Table 6. Factors causing neonatal deaths (n=1540).

Factors	Neonatal deaths
Pre-maturity	655 (42.5)
Sepsis	225 (14.6)
Asphyxia	403 (26.2)
Intra-cranial hemorrhage	32 (2.1)
Aspiration pneumonia	136 (8.6)
Hemolytic disorders	17 (1.1)
Malformations	40 (2.6)
Others	32 (2.1)
Total	1540 (100)

Figures in parenthesis represent percentages

(PMR 112.21). In deliveries at 28-32 weeks of gestation, the perinatal death was found to be high (PMR 150.55) (Table 3).

Pregnancy induced hypertension (PIH) and antepartum hemorrhage (APH) accounted for 21.9 % and 20.5% of the stillbirths respectively (Table 5). Pre-maturity and asphyxia accounted for 42.5% and 26.2% of the neonatal deaths respectively (Table 6).

Discussion

The PMR at our hospital was 70.2 in 2002 which is higher in comparison to the National PMR of 60¹. Study by different workers also shows an alarmingly high PMR in other institutions of India e.g. Udaipur – 105.78². The reason of such high PMR is probably our status as a referral hospital. In our study, the highest number of fetal deaths have occurred in the maternal age group of > 35

years and in women with parity of ≥ 5 . Apart from the age factor, increased PMR is due to other factors like lack of antenatal check-up (62.48% unbooked), low socioeconomic status, delayed referral, and long distances from the referral center ^{2,4}.

Saha and Saha ⁵ have shown a maximum PMR at < 37 weeks of gestation. We had maximum PMR between 28 and 32 weeks of gestation. In the present study, PIH and APH are the two major causes of still birth (21.9% and 20.5% respectively) similar to that reported by Raksha et al ⁶ and Kumar et al ⁷. The fetal factor mainly responsible for intrauterine death is intrauterine growth retardation (16.6%). Prematurity accounted for 42.5% of neonatal deaths compared to 59% reported by Gaddi and Seetharam ⁴. Asphyxia caused 26.2% of neonatal deaths compared to 20% reported by Khurana et al ⁸. Early neonatal deaths account for 40% to 43% of total perinatal deaths in India ⁷. In the present study there were 29.63% early neonatal deaths. This indicates a need for close monitoring with strict supervision during labor and proper pediatric care to reduce PMR. Over the last 10 years the neonatal deaths and the stillbirths have drastically fallen ($P < 0.01$) as shown in our study. As per the Census of India ⁹, the average literacy in the state of Orissa in 1991 was 49.09% which increased to 63.61% by 2001. This possibly increased the awareness for antenatal check-up and orientation towards hospital delivery, leading to a decrease in PMR (Table 3). The average per capita income in the state as per the Census of India increased from Rs. 4000/- to Rs. 6994/- by 1998 ⁹. In addition the Government has started a National Maternity Benefit Scheme (NMBS) program under which Rs. 500/- is given towards better food to every pregnant mother during the antenatal check-up. Again in another scheme the Government is providing Rs.100/- to the pregnant mothers traveling within 5 kilometers and Rs.150/- to those traveling more than 10 kilometers for referral treatment in hospitals. This will increase the interest in and financial capability for antenatal care, and timely transfer of women to the referral hospital contributing to the gradual decrease in PMR.

Analysis of the perinatal deaths helps us to ascertain the main causes of the perinatal deaths, to become aware about the present trend, and to plan necessary action. The present study indicates that we have a long way to reach the national goal of PMR of 30/1000. Apart from the clinical causes of the perinatal deaths, the high PMR at our hospital is due to associated factors like low socioeconomic condition, illiteracy, and poverty contributing to lack of awareness of the health care system available in the community. Most of the maternal and fetal factors contributing to PMR are preventable. A low PMR can be achieved by adequate health education, registration of all pregnant women, compulsory antenatal check-ups, early detection of high-risk cases and their timely referrals, observing and promoting small family norm, reinforcing nutritional supplement programs, and above all good, prompt and immediate institution of medical treatment for both mother and baby at tertiary hospitals.

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