Original Article

An audit and trends of perinatal mortality at the Jinnah Postgraduate Medical Centre, Karachi

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Abstract

Objective: To prospectively review the extent and determinants of perinatal mortality (PNM), at a large Government referral teaching hospital in Karachi and to compare the rate with previous data.

Methods: One year study from 1st January to 31st December 2001 was carried out in the Department of Obstetrics and Gynaecology, Jinnah Postgraduate Medical Centre, Karachi. A prospective review of all stillbirths from 28 weeks of pregnancy and neonatal deaths within first seven days of life in the hospital either in the obstetric ward or in the neonatal nursery was done. The details of each mother and newborn delivered were recorded on standardized proforma. Aberdeen (Obstetric) classification of perinatal deaths was applied in the survey for classification of perinatal causes.

Results: During the one year period from 1st January to 31st December, 2001, there were 7743 deliveries and 753 perinatal deaths. Five hundred and sixty nine were still born and 184 died within 7-days of birth. The perinatal mortality rate (PNMR) was 97.2/1000 total births and still birth rate 73.4/1000 total births. The leading cause of stillbirth was hypertensive disease of mother in 180 (24%). This included Pregnancy Induced Hypertension (PIH) 106 (14%) and eclampsia 74 (10%). The next common cause was mechanical, accounted for 161 (21.4%). Antepartum haemorrhage (APH) was responsible for 151 (20%) perinatal deaths and low birth weight (LBW) was identified in 108 (14.4%). Congenital malformation caused deaths in 47 (6.2%), maternal medical disorders as jaundice, anaemia and diabetes in 24 (3.2%) and neonatal infections as Respiratory Distress Syndrome (RDS), probable pneumonia, bleeding disorders and septicaemia caused deaths in 35 (4.8%).

Conclusion: Perinatal deaths are largely the result of poor maternal health, low socio-economic status, lack of health awareness and inadequate care during antepartum, intrapartum and postpartum period. Perinatal mortality rate has largely remained unchanged over the last 40 years at the premier referral and teaching institution of Karachi, due to higher patient influx and referral rate (JPMA 57:168;2007).

Introduction

Perinatal mortality is a sensitive indicator of the quality of service provided to pregnant women and their newborn. Perinatal mortality audit in an institution helps to find out not only the status of quality of services but also helps to determine the important cause of perinatal deaths and take measures to reduce it. According to WHO, the number of perinatal deaths worldwide is greater than 7.6 million, with 98% of these deaths occurring in developing countries.[1]

While developed countries have seen dramatic decline in perinatal mortality because of investments in reproductive health and socio-economic conditions, corresponding progress in low income countries has been slow. Because many births take place in domiciliary settings and are poorly reported, especially stillbirths,[2] reliable reports on perinatal mortality are lacking. In many parts of Africa and Asia PNMR is as high as 75/1000 and 36 - 74/1000 total births have been reported, respectively.[3]

While some estimates of perinatal mortality from community settings are available,[4] there are no country-specific estimates of perinatal mortality for Pakistan. A demographic survey of eight squatters settlements in Karachi indicated a perinatal mortality rate of 54/1000 births.[5] Similarly a large prospective study of village and peri-urban slum based population around Lahore revealed a perinatal mortality rate of 67/1000 total birth with still birth rate of 44%.[6]

Most of the methodologically sound available information on perinatal mortality in Pakistan is generated from hospital based studies.[7,8] A multicentre survey of hospital based studies by the Society of Obstetricians and Gynaecologists of Pakistan (SOGP) showed that overall PNMR was 92/1000 total births with the majority of deaths (72%) counted as stillbirths.[9] Although some data from private sector institutions are available, few studies are available from public sector institutions on sequential time trends and risk factors for perinatal mortality.[7,8]

Two previous studies of perinatal mortality rate at Jinnah Postgraduate Medical Centre (JPMC) from 1965-67 and 1989-90 showed a perinatal mortality rate of 92 and 101.8/1000 total births,[8,10] respectively. We now present a follow up prospective survey of perinatal mortality at the same institution after a 10 year interval.

Patients and Methods

The Department of Obstetrics and Gynaecology is the busiest Department of Jinnah Postgraduate Medical Centre, the premier referral hospital and Federal Teaching Institution in the city Karachi. While the department has 135 beds officially, most of the time 170 to 180 patients are present in the ward. Annual admissions exceed 12000 and approximately 7500 to 8000 deliveries take place every year. Booked cases are 30% and majority are referred cases, with some patients traveling over distances of 100 to 500km from the province of Balochistan and periphery of Sindh.

We prospectively evaluated perinatal mortality for all births at JPMC from 1st January to 31st December, 2001. All perinatal deaths after 28 weeks of gestation or weighing 1000gms or more were included in the study. A standardized proforma and case definitions for data collection was developed. The criteria for booked status were a minimum of three antenatal visits in index pregnancy. The maternal data included age, parity, period of gestation, complications in pregnancy, labour and mode of delivery. Infant data collected included weight, reported gestation age, sex, Apgar score at birth, age and the cause of death. Aberdeen (Obstetric) classification of perinatal deaths was applied in the survey for classification of perinatal causes, as it is more pertinent in the cause categorization, which is clinical and based on obstetrics risk factors. The causal explanation for three large groups of Wiggles worth and NICE classification namely intrauterine death, asphyxia and immaturity are difficult to be ascertained due to limitation in the diagnostic facilities of stillbirths and postmortem being declined in all cases due to religious and ethical reasons. Thus making Aberdeen classification, which is conceptually similarly to NICE classification,[11] as the most appropriate for resource-poor countries in perinatal studies.

Results

During the one year period, 1st January to 31st December, 2001, there were 7743 deliveries and 753 perinatal deaths. Five hundred and sixty nine (569) were stillborn and 184 died within 7 days of birth. Table 1 summarises the pertinent information pertaining to these births. Two hundred and eleven (28%) of the deaths occurred among booked patients and 542 (72%) in unbooked patients. The mean maternal age was 30.31 years and 317 (42.2%) and 307 (40.7%) of deaths occurred in mothers between 31 to 40 and 21 to 30 years of age respectively. One hundred eighty eight (24.9%) perinatal deaths occurred in primigravidae and 393(52.3%) in grand multiparae.

The majority of perinatal deaths were in preterm infants 570 (75.7%), and 183 (24.3%) were of 37 weeks gestation or more. The birth weight distribution of the babies was comparable and 415 (55.1%) of the babies weighed less than 2.5 Kg. The frequency of abnormal delivery was 37.9%, 91 Caesarean sections had to be performed on foetuses already dead, because of obstructed labour, placenta previa, cervical stenosis, and rupture uterus. The overall perinatal mortality rate was 97.2/1000 total births and still birth rate 73.4/1000 total birth. The perinatal mortality rate in our study is at a plateau consistent with PNMR at JPMC for last 40 years (Figure). Cause of perinatal deaths according to Aberdeen classification are shown in Table 2.

The commonest (24%) causes of death was hypertensive disease of the mother . This included pregnancy induced hypertension (PIH) 106 (14%) and eclampsia 74 (10%). The next commonest cause was mechanical accounting for 161 (21.3%) deaths. This group included patients with obstructed or prolonged labour, ruptured uterus, cord accidents and difficult deliveries where intrauterine anoxia and birth trauma were responsible for the deaths, Antepartum haemorrhage was the 3rd commonest cause responsible for 151 (20%) deaths, of these 106 (14%) were due to abruptio placentae, the single most common cause of stillbirths. In 108 (14.3%) cases, low birth weight (LBW) was the cause of perinatal deaths, the leading cause of death in neonates. Babies with LBW, where with obvious causes like PIH, Eclampica, abruption etc were not included in this group.Of congenital malformation, which caused deaths in

Table 1.

Booking Status	SB	NVDs	Total	%
Booked	142	69	211	28
Un booked	427	115	542	72
Age in years				
15 - 20	51	22	73	9.7
21 - 30	231	76	307	40.7
31 - 40	244	73	317	42.2
> 40	43	13	56	7.4
Parity				
0 + 0	139	49	188	24.9
1 - 4	134	38	172	22.8
5 >	296	97	393	52.3
Gestational Age in weeks				
28 - 32	275	10	382	50.7
33 - 36	148	40	188	25
> 37	146	37	183	24.3
	569	184	753	100

Total No. of deliveries	=	7743
Total perinatal deaths	=	753
Total stillbirth	=	569
Total NNDs	=	184
Perinatal mortality rate	=	97.2/1000 total births
Stillbirth rate	=	73.4/1000 total births

Table 2. The Aberdean Classification causes of perinatal deaths.

Causes of death	SB	NVDs	Total	%
Congenital anomalies	43	4	47	6.2
Hydrocephalus	12	3	15	2.0
Anen cephalous	17	-	17	2.3
Miningomylocole with spinabifida	3	1	4	0.5
Spinabifida with cleft palate	5	-	5	0.7
Omphalocele	2	-	2	0.2
Multiple (Talipies, Cleft palate etc.)	4	-	4	0.5
Hypertensive disorders	159	21	180	24
PIH	94	12	106	14
Eclampsia	65	9	74	10
APH	142	9	151	20
Abruptio placenta	99	7	106	14
Placenta previa	43	2	45	6
Mechanical	136	25	161	21.3
Obstructed and prolonged Labour	47	18	65	8.6
Cord prolapse	41	-	41	5.4
Ruptured uterus	20	-	20	2.7
Transverse lie	13	-	13	1.7
Breech	9	4	13	1.7
Forceps	6	3	9	1.2
Maternal infections and diseases	16	8	24	3.2
Heart disease	1	2	3	0.4
Jaundice	4	1	5	0.7
Anaemia	2	1	3	0.4
Diabetes	9	4	13	1.7
Isoimmunization	4	3	7	0.9
Neonatal infections	-	35	35	4.8
RDS	-	14	14	2.0
Bronchopneumonia	-	10	10	1.3
Bleeding disorders	-	2	2	0.3
Septicaemia	-	9	9	1.2
Unexplained				
* Birth weight <2.5kg	51	57	108	14.4
* Birth weight >2.5Kg	18	22	40	5.4
Total	569	184	753	100

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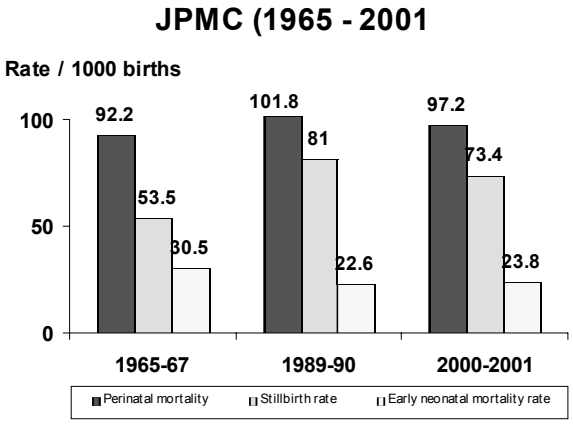
The commonest (24%) causes of death was hyper-

Perinatal mortality trends



tensive disease of the mother . This included pregnancy induced hypertension (PIH) 106 (14%) and eclampsia 74 (10%). The next commonest cause was mechanical accounting for 161 (21.3%) deaths. This group included patients with obstructed or prolonged labour, ruptured uterus, cord accidents and difficult deliveries where intrauterine anoxia and birth trauma were responsible for the deaths, Antepartum haemorrhage was the 3rd commonest cause responsible for 151 (20%) deaths, of these 106 (14%) were due to abruptio placentae, the single most common cause of stillbirths. In 108 (14.3%) cases, low birth weight (LBW) was the cause of perinatal deaths, the leading cause of death in neonates. Babies with LBW, where with obvious causes like PIH, Eclampica, abruption etc were not included in this group.Of congenital malformation, which caused deaths in 47 (6.2%) cases the commonest were anencephaly (17) and hydrocephaly (15). The others are shown in Table 2. Medical disorders of mother were responsible for 24 (3.2%) deaths of which 16 were still born. Diabetes mellitus was found in 13 cases. Of these 9 patients were admitted with intrauterine death and uncontrolled diabetes .Neonatal infections were responsible for 35 (4.8%) NNDs, a significant contributor of PNMR.

Discussion

In our survey, perinatal mortality rate was similar to other under developed countries.[12,13] These figures, are not strictly comparable with population-based data from England and Wales or Denmark and Sweden,[14,15] but are indicative of large public sector hospitals in developing countries.

The trend in perinatal mortality rate has been static over the last 40 years at JPMC, due to low socio-economic status, poverty, malnutrition and lack of antenatal care and a large burden of referred cases.[8,10] The high perinatal mortality rate shown here is a reflection of inadequacy and inaccessibility of maternity services of our country and the poor socio-economic status and cultural pattern of the population.

With regard to parity of the mothers it has been observed that perinatal mortality has been higher among the first born and after the 5th child, as grandmultiparity is an established obstetrical and medical risk factor for both mother and foetus.[16] This was also noted in our previous study.[10] Considering the "period of gestation" this is important for survival of infants as pointed out by other studies.[17] In this study largest number of deaths were noted in infants born before 37 weeks of gestation. This is similar to other studies.[18,19] Abruptio placentae was the commonest cause of still births and more than 50% of these babies weighed 2.5Kg and above. Abruptio is an important cause of perinatal mortality and morbidity in the developing countries and even in USA 15% of deaths occur due to abruptio placentae.[20] In the low socio-economic group of patients maternal malnutrition resulting under perfusion of the placental site is said to increase the risk of abruption.

Deaths of big babies was due to difficult labour, obstetric labour, ruptured uterus and cord accidents. This mortality is indicative of lack or in adequacy of antenatal and intra-natal care. In this study congenital malformations were seen in 47 (6.2%) deaths. Though all congenital malformations were obviously not incompatible with life it is possible that other malformations existed which were not diagnosed as no autopsy was carried out. Congenital malformation has become important cause of death in the developed world as other causes are eliminated and it is now responsible for more than 20% of deaths.[21] The frequency of abnormal deliveries in the study group was higher (37.9%). This is also comparable to other studies.[22] This appears to have been due to the fact that a large number of cases received at this centre are emergency cases. These cases did not have any antenatal care and were included such complicated cases, which the doctors and some of the small maternity homes could not deal with. This has increased the frequency of abnormal deliveries and of PNM. So our study points to the necessity of improved antenatal care of the mother.

What can and should be done? The problem of emergencies can be reduced only if the private maternity homes have had adequate arrangements for emergency resuscitative measures, such as intravenous infusion, blood transfusion and skilled obstetrician. This would lower the frequent necessity of rushing the patient to the hospital at the last minute which further tends to increase the perinatal mortality. Overall improvement in the socio-economic status of our population with better nourishment, education change in cultural pattern, health awareness and availability of good maternal and neonatal services are important factor for reducing perinatal mortality.

The study had certain limitations. Being prospective and analytical in design, there was adversity in population on ethnicity, socio-economic status and education level. It was conducted in a tertiary level referral hospital so the results cannot be generalized. The viability limit for perinatal period was taken as weeks due to limited access to neonatal intensive care unit and loss of follow up after discharge could influence the infant mortality rate figures.

Conclusion

Perinatal deaths are largely the result of poor maternal health, low socio-economic status, lack of health awareness and inadequate care during antepartum, intrapartum and postpartum period. Perinatal mortality rate has largely remained unchanged over the last 40 years at the premier referral and teaching institution of Karachi, due to higher patient influx and referral rate.

References

1. Kusiako T, Ronsmans C, Van der Pall L. Perinatal mortality attributable to complications of childbirth in Matlab, Bangladesh. Bull WHO 2000; 78: 621-7.
2. Lawn J, Shibuya K, Stein C. No cry at birth: global estimates of intrapartum stillbirths and intrapartum related neonatal deaths. Bull WHO 2005; 83: 409 - 7.
3. Chowdhry AA, Chowedhry S. Maternal and perinatal mortality: safe motherhood. In: Rana S, Obstetrics and perinatal care for developing countries. Islamabad. SAF publications 1998; pp 34 - 75.
4. Bhutta ZA, Maqbool S. Perinatal and newborn care in Pakistan. A manual for physicians, reproductive health, Karachi. J Coll Physicians Surg Pak 2002; 121: 93 - 109.
5. Fikree FF, Gray RH. Demographic survey of the level and determinants of perinatal mortality in Karachi, Pakistan. Pediatr Perinatal Epidemiol 1996; 10: 860 - 91.
6. Jalil F, Linblad BS, Hanson LA, Khan SR, Yaqoob M, Karlberg J. Early child health in Lahore, Pakistan, IX, Perinatal events, Acta Paediatr (Suppl) 1993; 390: 95 - 107.
7. Farook SMD. Perinatal Mortality at Liaquat Medical College Hospital. Pak J Med Res 1994; 33: 258 - 61.
8. Korejo R, Jafary N. Perinatal mortality in Jinnah Postgraduate Medical Centre Karachi; J Pak Med Assoc 1991; 41: 151 - 54.
9. Zaidi S. Maternal and perinatal health in Pakistan. In: Zaidi S, (ed). Proceedings of a workshop held at Peshawar on 7-8 January 1993 by the Society of Obstetrics and Gynaecology (AOFOG). TWEL, Publishers 1993: pp 97 - 117.
10. Rahimtoola RJ, Saeed M, Butta T. Perinatal mortality. A three years study at JPMC, Karachi. JPMA 1969; 19: 136 - 43.
11. Winbo IGB, Serenius FH, Dahlquist GG, Kallen BAJ. NICE, a new cause of death classification for stillbirth and neonatal deaths. Intern J Epidem 1998; 27: 499 - 504.
12. Milaat WA, Du V Florey C. Perinatal mortality in Jeddah, Saudi Arabia. Internat J Epidemiol 1992; 21: 82 - 90.
13. Mavalankar DV, Trivedi CR, Gray RH. Levels and risk factors for perinatal mortality in Ahmedabad, India, Bulletin of the World Health Organization, 1991, 69: 435 - 42
14. Potentially avoidable perinatal deaths in Denmark and Sweden. Ugeskr-Leagr 1997; 159: 5378 - 82.
15. Froen JF, Amestad M, Frey K, Vege A, Sangstad OD, Stray-Ped-ersen B. Risk factor for sudden intrauterine unexplained eath: epidemiologic characteristics of singleton cases in Oslo, Norway, 1986 - 1995. am J Obstet Gynecol 2001; 184: 694 - 702.
16. Babinszki A, Kerenyi T, Torok O, Grazi V, Lapinski RH, berkowitz RL. Perinatal outcome in grand and great-grand multiparity: Effects of parity on obstetrics risk factors. Am J Obstet Gynecol 1999; 181: 669 - 74.
17. Manandhr SR, Manandhar DS, baral MR, Pandey S, padhey S. One year audit of perinatal mortality at Kathmandu Medical College Hospital, Kathmandu Univer Med J 2003; 2: 198 - 202.
18. Sami S, Baloch SN. Perinatal mortality rate in relation to gender. J Coll Physicians Surg Pak 2004; 9: 545 - 48.
19. Stephansson O, Dickman PW, Johansson A, Cnattinguis S. maternal weight, pregnancy weight gain, and the risk of antepartum stillbirth. Am J Obstet Gynecol 2001; 184: 463 - 8.
20. Sultana A, Irfan y, Ahmed R. Abruptio placentae - Risk factors and perinatal outcome. Med Spectrum 2001; 22: 3 - 5.
21. Shah NM, Shah MA, Khalaf AA, Mustafa MM, Al-Sayed A. Searching for socio-economic risk factors in perinatal mortality in Kuwaica: a case control study. Soc Sci Med 2000; 51: 539 - 50.
22. Shah D, Shroff S, Ganla K, Factors affecting perinatal mortality in India. Int J Gynaec Obst 2000; 71: 209 - 10.