

5 YEAR AUDIT OF PERINATAL MORTALITY IN A TERTIARY TEACHING HOSPITAL – A RETROSPECTIVE STUDY

Hema Patil¹, Satwik Metgud²

HOW TO CITE THIS ARTICLE:

Hema Patil, Satwik Metgud. "5 year audit of perinatal mortality in a tertiary teaching hospital – a retrospective study". Journal of Evolution of Medical and Dental Sciences 2013; Vol2, Issue 49, December 09; Page: 9511-9519.

ABSTRACT: BACKGROUND AND OBJECTIVES: Perinatal mortality is the most sensitive index of the efficacy of not only antenatal, intranatal care and the quality of child health but also of socioeconomic status of the community. This study was aimed to assess the perinatal mortality rate and determinants of perinatal mortality at a tertiary care centre. **METHODOLOGY:** This retrospective hospital based study included all the perinatal deaths (> 20 weeks / > 500 gms) and neonatal deaths (within 28 days of birth) during the period from 2008 to 2012. Data regarding maternal age, booking status, mode of delivery, sex of baby, birth weight, congenital anomalies and probable cause of death were collected. **RESULTS:** The PMR was found to be 47.95 per 1000 births. The PMR during 2008 was at peak with 58.72 per 1000 births which gradually showed a trend towards reduction with minimum at 39.57 per 1000 births during 2012. The PMR was high among the women who were aged between 20 to 30 years while it was comparable in women with primi and multi parity. Most of the mothers were unregistered for ANC (64.84%) and vaginal delivery was noted in 76.65% of the mothers. The mortality was found to be high in fetus < 1 kg (31.08%) and least in those with > 3.5 Kgs (1.24%). The commonest cause of PMR was placental abruption (17.6%). **CONCLUSION AND INTERPRETATION:** There Is a strong need to strengthen the educational and communication activities to create awareness about antenatal health care, identification of high risk mothers, timely referral, advanced life support of preterm neonates which would help in reducing the PMR.

KEYWORDS: Early neonatal death; Perinatal mortality rate; Stillbirth.

INTRODUCTION: Children are an important asset of the nation, therefore reduction in perinatal mortality is likely to be the most important objective of the Millennium Development Goals (MDG). Infant and child mortality rates reflect a country's level of socio-economic development and quality of life and are used for monitoring and evaluating population, health programmes and policies.¹

Newborn health and survival depend on the care given to the newborn, although newborn care is a very essential element in reducing perinatal mortality, it often receives less than optimum attention. There have been agreements to affirm the world's commitment to improving newborn health. Current global evaluations confirm that commitment to improving newborn health makes meaningful socio-economic contributions.²

Though newborn health is closely related to that of their mothers, newborns have a unique need that must be addressed in the context of maternal and child health services. They further argued that millions of newborn deaths could be avoided if more resources were invested in proven low-cost interventions designed to address newborn needs.³

Perinatal mortality is the most sensitive index of efficacy of not only antenatal, intranatal care and quality of child health but also of socioeconomic condition of the community.⁴

ORIGINAL ARTICLE

Perinatal mortality rate (PMR) is late fetal death (more than or equal to 28 weeks gestation) and neonatal death (within 28 days of birth) in one year to total number of live births in the same year.⁵ It is expressed as rate per 1000 live births.⁵ It also refers to the number of still birth and deaths within the 1st week of delivery per 1000 live births. Perinatal death complicates about 1.5% of all births in developed countries.⁶ Perinatal mortality rate (PMR) in developing countries is 3 to 5 fold higher than that in the developed countries. The current PMR in India is 49 per 1000.⁷ In India, the Perinatal Mortality Rate varies in the range of 37 to 35 in 2001 and stood at 35 in 2009. It is high in rural areas (39/1000) as compared to urban areas (23/1000) in 2009. The Peri-natal Mortality Rate significantly varied across the states. Kerala with 13 is the best performing state, Madhya Pradesh and Chhattisgarh (45/1000) are the least performing states during 2009.⁶

Various authors worldwide have documented the causes for perinatal mortality. The causes could be antenatal such as maternal diseases like hypertension, diabetes, cardiovascular diseases etc.; intranatal such as birth injuries, asphyxia, prolonged labour, obstetric complications; or postnatal such as prematurity, respiratory distress syndrome and congenital anomalies. The non-medical factors include financial constraints at individual level and education and occupation of the parents. High maternal age, primi-parity, high parity, smoking, low socio-economic status, being a single mother and early perinatal loss have been identified as risk factors for perinatal mortality. The biomedical determinants include maternal factors such as age, parity, antenatal care, bad obstetric history and pregnancy-related complications and perinatal and neonatal factors such as birth weight, gestational age, infection and congenital malformations.⁵

Current global evaluations confirm that commitment to improving newborn health makes meaningful socio-economic contributions. The present study was aimed to assess the perinatal mortality rate, determinants of perinatal mortality in a 5 year period at a tertiary care centre which would help in identification and provide useful information to plan necessary interventions in reducing PMR.

METHODOLOGY: This retrospective hospital based study was conducted in the Department of Obstetrics and Gynaecology of a tertiary care centre located in North Karnataka. All the perinatal deaths (> 20 weeks / > 500 gms) and within 28 days of birth. during the period from 2008 to 2012 were evaluated. Prior to the commencement of the study, permission was obtained from the Department of Medical Records to assess the data. Data regarding maternal age, booking status, mode of delivery, sex of baby, birth weight, congenital anomalies and probable cause of death was collected and the cause of death was ascertained based on Wigglesworth Classification.⁸The data was analysed and expressed as rates, ratios and percentages.

RESULTS: A total of 16703 births were recorded during the period of 2008 to 2012. Of these, 801 perinatal deaths were noted (fresh stillbirths in 549, macerated still births in 194 and early neonatal deaths in 63). The PMR was found to be 47.95 per 1000 births (Graph 1). The PMR during 2008 was highest (58.72 per 1000 births) which gradually showed a trend towards reduction with minimum (39.57 per 1000 births) in 2012 (Graph 2).

The maternal characteristics are as shown in table 1. It was observed that PMR was high among the women who were aged between 20 to 30 years while it was comparable between primigravida (45.26%) and multigravida (45.91%) women. 507(64.84%) of women were unbooked

ORIGINAL ARTICLE

275 (35.16%) were booked and 614 (76.65) women delivered vaginally, 187(76.6%) were LSCS. Table 2 shows the fetal characteristics of the study population. The mortality was found to be high in babies < 1 kg (31.08%) and least in those with > 3.5 Kgs (1.24%). Slight male preponderance was noted (51.68%) [(48.31%) female } and 70.66% were preterm, 29.33% were term babies.. The causes of perinatal mortality are as shown in Table 3.

DISCUSSION: Families are the root of a nation's health system. Good health starts at the grass root level and spreads to the society at large. Newborn care remains an ignored problem and this has a negative impact on MDG 4 on child health which pledges to reduce under five years mortality by the year 2015. Good health services to mothers during pregnancy, labour and delivery have a intense impact on newborn survival.⁹ Despite the advances in fetomaternal medicine, perinatal death rate continues to be high. Perinatal death is a traumatic experience for both mother and the obstetrician.

In this study the PMR was found to be 47.95 per 1000 births. The PMR in 2008 was at peak with 58.72 per 1000 births which gradually showed a trend towards reduction with minimum at 39.57 per 1000 births in 2012. The PMR in India is still over 50 per 1000 and has shown virtually no decline during the past decade. The perinatal death audit done in Kathmandu Medical College Teaching Hospital (KMTCH) for one year period from September 2002 to August 2003 showed perinatal mortality rate of 47.9 per 1000 births.¹⁰ A study¹¹ from Ludhiana reported PNMR as 51/1000 total births, which is in agreement with the WHO¹² data for Asia as well as other study.¹³ An ICMR study reported a PNMR of 65/1000 births in ICDS project areas of urban slums in Delhi.¹⁴ A study from Lucknow reported PNMR of 59/1000 births in 25 Anganwadi centres.¹⁵ The rate of perinatal mortality observed during the study period that is, 47.95 per 1000 births was close to the national PMR and comparable with the studies done in Kathmandu,¹⁰ Ludhiana¹¹ and WHO.¹² However, a recent study¹⁶ from Tumkur, Karnataka from June 2008 to 2010 reported PMR of 127.4/1000 total births which was very high compared to other studies as well as present study. Considering the above rate of perinatal mortality it seems that, achievement of national goal of PMR that is, 30/1000 births¹⁷ is closer in our institute. The wide variation in the rate of perinatal mortality in present and other studies could be attributed to geographical variations (studies from different states), place of residence (urban/rural areas), Health care facilities available and other socio demographic and cultural determinants such as socio economic status, educational status, type of family, religion and so on.¹⁰

In the present study the PMR during the 2012 was low that is 39.57 per 1000 births. The possible reason for improved perinatal outcome in our institution could be due to better obstetric care and availability of tertiary level neonatal care, moreover the community awareness regarding essential obstetric and newborn care was high due to ongoing community based projects like EMONC and Helping Babies Breath (HBB) in the surrounding areas catered by our institution. In addition regular high risk antenatal clinics also conducted at the PHC level which helped in early identification and referral of high risk antenatal cases, thus optimizing the perinatal outcome.

In the present study PMR was high among the mothers who were aged between 20 to 30 years. In a study higher PMR was found in mothers who were either too young (<20 years old) or too old (\geq 30 years old), with the former group being the 8.07 [CI 5.09, 12.78]] as compared to older age group.¹¹ These findings were in agreement with those of Lucknow¹⁵ and Bangladesh.¹⁸

ORIGINAL ARTICLE

In this study it was observed that, PMR was comparable in women in terms of parity. Other studies^{7,19} have observed higher PNMR in multi parous women compared to primi parous. 507(64.84%) of women were unbooked 275(35.16%) were booked and 76.65% delivered vaginally 23.34% were by LSCS. Similar findings were reported in the study from Orissa²⁰ and Ludhiana.¹¹ A recent study¹⁶ from Karnataka also reported high PMR among elderly mothers, grandmultipara (>5) and unbooked women and similar observations were reported by the Wassan K et al²¹ and Seetharam G et al.²²

In this study the mortality was found to be high in babies < 1 kg (31.08%) and least in those with > 3.5 Kgs (1.24%) and 70.66% were preterm, only 29.33 were term babies which is in agreement that as gestational age reduces Perinatal mortality risk increases. Perinatal deaths were common in low birth weight and premature babies in studies done by Anjali et al,²³ and a recent study from Karnataka.¹⁶ A study¹¹ from Ludhiana reported low birth weight (LBW) babies (birth weight < 2.5 kg), suffered a significantly higher perinatal mortality (PNMR = 179.3/1000, RR old), 8.07 [CI 5.09, 12.78]) as compared to the normal birth weight babies weighing 2.5 kg or more (PNMR=22.2/1000). Bamji et al²⁴ also found same proportion of preterm babies in Andhra Pradesh. LBW babies, babies with gestational age <37 weeks and those delivered by untrained dais suffered significantly higher perinatal mortality. LBW babies contributed to 64.4% of the total perinatal mortality. Saha and Saha²⁵ have also shown maximum PNMR among babies < 37 weeks of gestation. A study²⁰ from Orissa also showed higher PNMR rates between 28 to 32 weeks of gestation.

In the present study, the commonest cause of PMR was placental abruption (17.6%) followed by lethal fetal anomalies (10.61%) and fetal growth restriction (10.48) Based on Wigglesworth Classification⁸ the commonest cause of PMR in group A, lethal fetal anomalies (10.61%), in group F which included the maternal causes, PIH was the common cause (10.11%) while birth asphyxia (2.37%) was seen commonly as intrapartum cause (Group G). In 9.98% of cases no relevant cause could be ascertained. A study²⁶ from Jinnah Postgraduate Medical Centre, Karachi reported PIH (24%) as leading cause of stillbirth. Other study by Raksha et al²⁷ and Kumar et al²⁸ also reported PIH and APH as major causes of perinatal death. Another study²⁰ from Orissa also showed similar results. In a six year prospective perinatal audit²⁹ at a tertiary hospital in order to determine foetal outcome, and the common causes of foetal and early neonatal deaths reported that the leading causes of stillbirths were the hypertensive disorders of pregnancy, abruptio placentae, diabetes mellitus, intrapartum foetal distress and lethal congenital anomalies.

The study has some limitations. First, this was a retrospective study and hence some data was incomplete. Second, various socio demographic and socio cultural variables were not included in the study such as religion, occupation, socioeconomic status, literacy and type of family. Third, the association was not determined due to the limited data and it was beyond the scope of our objectives. Further studies considering these variables may provide insights in reducing perinatal mortality and would further help to achieve the National goal.

BIBLIOGRAPHY:

1. Paria D. Present socio-economic scenario; incident of infant mortality in West Bengal. *Radix International J Res Soc Sci* 2013;2(2):1-25.
2. Yinger NV, Ransom EI. Why Invest in Newborn Health? 2003 Available from: http://www.prb.org/pdf/whyInvestnewborn_Eng.pdf Accessed on: 20.01.2013.

ORIGINAL ARTICLE

3. Tinker A, Ransom E. Healthy Mothers and Healthy Newborns: The Vital Link. Washington, DC: Population reference Bureau; 2003.
4. D'costa GF, Patil Y. Causes of Mortality in Still Birth – An autopsy study. *Bombay Hospital J* 2007;49(2):
5. Kulkarni R, Chauhan S, Shah B, Menon G, Puri C. Investigating causes of perinatal mortality by Verbal Autopsy in Maharashtra, India. *Indian J Comm Med* 2007;32(4): 259-63.
6. Horn LC, Langer A, Stiehl P, Wittekind C, Faber R. Identification of the causes of intrauterine death during 310 consecutive autopsies. *Eur J Obstet Gynecol Reproduct Biol* 2004;113(2):134-8.
7. Nayak K, Vaishali N, Gaikwad PR. Causes of stillbirth. *J Obstet Gynecol India* 2008;58(4):314-7.
8. Wigglesworth Classification
9. Vinod KP. Current State of Newborn Health in Low income countries and the way forward, *Seminars in Fetal and Neonatal Medicine* 2005;11:7-14.
10. Bhav SA. Trends in perinatal and neonatal mortality and morbidity in India. *Indian Pediatr.* 1989; 26(11): 1094-9.
11. Benjamin AI, Sengupta P, Singh S. Perinatal mortality and its risk factors in Ludhiana: a population-based prospective cohort study. *Health and Population Perspectives and Issues* 2009; 32 (1): 12-20.
12. World Health Organization. Neonatal and Perinatal Mortality: Country, Regional and Global Estimates; Geneva: WHO; 2006. p. 20.
13. Agarwal VK, Gupta SC, Roychowdhary S, Narula KK, Sharan R, Pandey RC, et al. Some Observations on Mortality. *Indian Paediatrics* 1982; 19: 233-38.
14. Indian Council of Medical Research Delhi. A National Collaborative Study of Identification of High Risk Families, Mothers and Outcome of the Offsprings with Particular Reference to the Problem of Maternal Nutrition, Low Birth Weight, Perinatal and Urban Slum Communities: New Delhi: A Task Force Study. New Delhi, ICMR; 1990. p. 45 -82.
15. Kapoor RK, Srivastava AK, Misra PK, Sharma B, Thakur S, Srivastava KL, et al. Perinatal Mortality in Urban Slums in Lucknow. *Indian Paediatrics* 1996; 33: 19-23.
16. Kokila MS, Dwivedi AD. Audit of perinatal mortality at SSMCHRC-(Rural teaching hospital) A retrospective study. *Al Ameen J Med Sci* 2013;6(2):128-33.
17. Das Lucy et al, Satapathy, Umakant, Panda Niharika. Perinatal Mortality in a referral hospital of Orissa-A 10 year review. *J Obstet Gynecol India* 2005; 55(6): 517-20.
18. Kusiako T, Ronsmans C and Van der Paal L. Perinatal Mortality Attributable to Complications of Childbirth in Matlab, Bangladesh. *WHO Bulletin* 2000; 78 (5): 621-627.
19. Fretts RC. Etiology and Prevention of stillbirth. *Am J Obstet Gynecol* 2005; 193: 1923-35.
20. Das L, Satapathy U, Panda N. Perinatal mortality in a referral hospital of Orissa – A 10 year review. *J. Obstet Gynecol India* 2005; 55 (6): 517-20.
21. Wassan K Rani S, Haider G. Perinatal mortality-A hazardous dilemma. *Rawal Medical Journal* 2009;34(2):195-8.
22. Gaddi SS, Seetharam S. A study of Perinatal Mortality in Head Quarters Hospital of Bellary. *J Obstet Gynecol Ind* 2001;51:101-3.
23. Anjali AK, Manjusha VJ. Perinatal Mortality in GOA medical College. *J Obstet Gynecol Ind* 2001;51:115-117.

ORIGINAL ARTICLE

24. Bamji MS, Murthy PVVS, Williams L, Rao MVV. Maternal Nutritional Status and Practices and Perinatal, Neonatal Mortality in Rural Andhra Pradesh, India. *Indian J Med Res* 2008; 127: 44 - 51.
25. Saha S, Saha A. Clinical audit of perinatal mortality – A reappraisal of major determinants and its prevention. *J Obstet Gynecol India* 2002; 52(3): 83-6.
26. Korejo R, Bhutta S, Noorani KJ, Bhutta ZA. An audit and trends of perinatal mortality at the Jinnah Postgraduate Medical Centre, Karachi. *J Pak Med Assoc.* 2007; 57(4): 168-72.
27. Raksha A, Uma D, Majumdar K. Perinatal morbidity and mortality in antepartum hemorrhage. *J Obstet Gynecol India* 2001; 51(3): 102-4.
28. Kumar MR, Bhat BV, Oumachigui A. Perinatal mortality trends in a referral hospital. *Indian Pediatr* 1996; 63: 357-61.
29. Bassaw B, Roopnarinesingh S, Sirjusingh A. An audit of perinatal mortality. *West Indian Med J.* 2001; 50(1): 42-6.

Characteristics		Year					Total (%)
		2008	2009	2010	2011	2012	
Age (Years)	< 20	20	25	28	20	18	111 (13.85%)
	20 to 30	128	139	132	126	131	656 (81.89%)
	> 30	5	6	3	8	12	34 (4.25%)
Parity	Primi	61	76	65	79	73	354 (45.26%)
	Multi	69	76	78	62	74	359 (45.91%)
	Grand multi	11	13	18	13	14	69 (8.82%)
Booking status	Registered	65	51	55	46	58	275 (35.16%)
	Unregistered	87	105	108	104	103	507 (64.84%)
Mode of delivery	Vaginal	108	126	133	118	129	614 (76.65%)
	Caesarean	45	44	30	36	32	187 (23.34%)

Table 1: Maternal characteristics

Characteristics		Year					Total (%)
		2008	2009	2010	2011	2012	
Birth weight	<1	41	60	52	39	57	249 (31.08%)
	1 to 1.5 kg	48	46	40	43	42	219 (27.34%)
	1.5 to 2 kg	24	18	14	37	23	116 (14.48%)
	2 to 2.5 kg	22	21	27	22	19	111 (13.85%)
	2.5 to 3 kg	11	18	18	11	10	68 (8.48%)
	3 to 3.5 kg	01	9	07	03	08	28 (3.49%)
	> 3.5 kg.	00	4	05	00	01	10 (1.24%)
Sex	Male	78	92	87	74	83	414 (51.68%)
	Female	75	78	76	80	78	387 (48.31%)
Gestation	Preterm	102	125	104	114	121	566 (70.66%)
	Term	51	45	59	40	40	235 (29.33%)

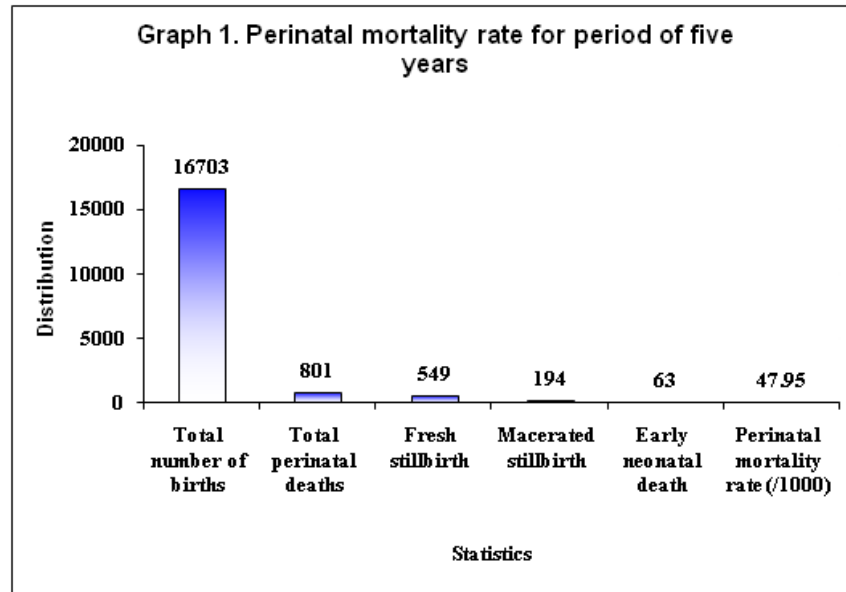
Table 2: Fetal characteristics

ORIGINAL ARTICLE

Causes	2008	2009	2010	2011	2012	Total	Percent
Group A - Fetal							
Lethal Fetal anomalies	13	18	18	15	21	85	10.61%
Acute infection (Sepsis)	-	-	3	3	1	7	0.87%
Non - immune hydrops	-	1	7	-	3	11	1.37%
Rh Iso-immunization	1	3	1	-	-	5	0.62%
Extreme Prematurity	16	5	6	23	6	56	6.99%
Twin - twin transfusion	1	4	3	8	1	17	2.12%
Fetal growth restriction	12	9	19	27	17	84	10.48%
Hyaline membrane diseases	4	14	2	3	3	26	3.24%
Milk Aspiration	2	-	-	-	-	2	0.24%
IUD	-	-	-	-	11	11	1.37%
Group B - Umbilical cord							
Prolapse	2	3	1	-	2	8	0.99%
Constricting loop / knot	1	1	-	4	-	6	0.74%
Group C - Placental							
Placental Abruption	41	27	24	17	32	141	17.60%
Placenta Praevia	4	5	2	7	1	19	2.37%
Placental insufficiency	2	6	4	4	-	16	1.99%
Group D - Amniotic fluid							
Oligohydramnios	7	3	14	-	4	28	3.49%
Polyhydramnios	-	-	-	-	1	1	0.12%
Group E - Uterus							
Rupture uterus	2	4	1	-	1	8	0.99%
Arcuate	-	1	-	-	-	1	0.12%
Group F - Maternal							
Diabetes	1	-	3	5	7	16	1.99%
PIH	13	13	12	18	25	81	10.11%
APLA	-	-	1	8	8	17	2.10%
Post dated Pregnancy	3	3	5	3	-	14	1.74%
Others	1	3	12	6	1	23	2.87%
Cardiac diseases	-	4	2	3	2	11	1.37%
Group G - Intrapartum							
Birth asphyxia	1	5	10	3	-	19	2.37%
Birth trauma	-	1	-	1	-	2	0.24%
MAS	3	3	-	-	-	6	0.74%
Others							
No relevant cause	15	17	14	19	15	80	9.98%

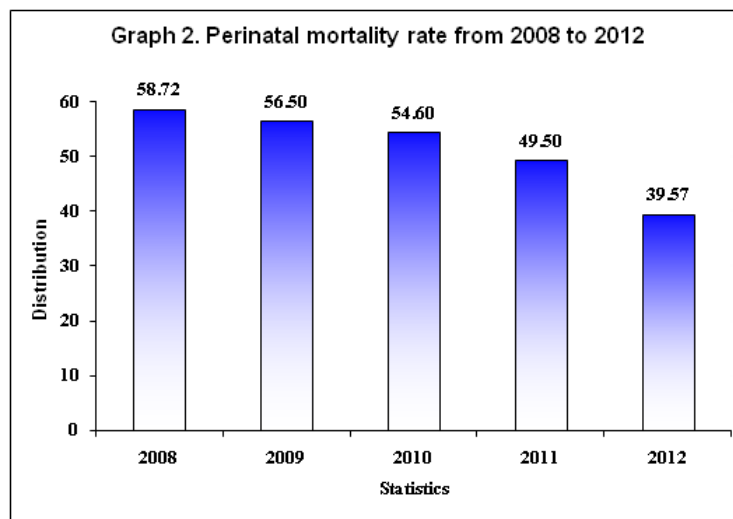
Table 3: Causes of perinatal mortality

ORIGINAL ARTICLE



List of abbreviations:

- PMR – perinatal mortality rate
- ANC – antenatal care
- LBW – low birth weight
- APH – antepartum haemorrhage
- PIH – pregnancy induced hypertension



List of abbreviations :

- PMR – perinatal mortality rate
- ANC – antenatal care
- LBW – low birth weight
- APH – antepartum haemorrhage
- PIH – pregnancy induced hypertension

ORIGINAL ARTICLE

AUTHORS:

1. Hema Patil
2. Satwik Metgud

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Obstetrics and Gynaecology, KLE's Dr Prabhakar Kore Charitable Hospital.
2. Post Graduate, Department of Obstetrics and Gynaecology, KLE's Dr Prabhakar Kore Charitable Hospital.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Satwik Metgud,
KAS-MET, BC-82, Lytton Road,
CAMP, Belgaum – 590001.
Email – drsatwikmetgud@gmail.com

Date of Submission: 22/11/2013.
Date of Peer Review: 23/11/2013.
Date of Acceptance: 28/11/2013.
Date of Publishing: 03/12/2013