



Original Research Article

## **An Analysis of the Institutional Deliveries and Their Outcomes in Government Teaching Hospitals of Andhra Pradesh, India**

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Received: 23/03/2013

Revised: 20/04/2013

Accepted: 24/04/2013

### **ABSTRACT**

**Introduction:** Pregnancy is a normal physiological process, but the outcomes vary from place to place and from one health care facility to another. The type of delivery, the status and weight of the new born and the maternal deaths are some of the factors we analyzed in the 18 Government teaching hospitals including maternity hospitals in the state of Andhra Pradesh, India in this study.

**Method:** This is a retrospective study. Data records of all the deliveries conducted from the 18 Government hospitals were used for the period from April 2011 to March 2012. A total of 1,37,415 deliveries conducted, forms the basis of this study.

**Results:** Nearly 63% of the deliveries conducted were normal deliveries and 31% were by Caesarean Sections. Still birth rate was 17.6/1000 total births. The prevalence of low birth weight babies born in these hospitals was 11.43%. The total number of maternal deaths was 217. Maternal Mortality Rate was 157/1,00,000 live births. Nearly two-thirds of the maternal deaths (64.52%) occurred during the post natal period. Pregnancy Induced Hypertension (30.41%) and Haemorrhage (16.59%) were the most common causes for the maternal death.

**Conclusions:** In spite of the high number of deliveries and at risk mothers handled by the Government teaching and maternity hospitals, the stillbirth rate and the maternal mortality rate are comparatively lower to the rates prevailing in our country. To save lives, many a times caesarean sections have to be performed as an emergency procedure. However, there is still a lot of room for improvement.

**Key words:** Teaching hospital, Caesarean section, Stillbirth rate, maternal mortality rate

### **INTRODUCTION**

A teaching hospital is a hospital that provides clinical education and training to future and current doctors, nurses, and other health professionals, in addition to delivering medical care to patients. <sup>(1)</sup> When common people need medical treatment they may be given it in a teaching hospital.

Teaching hospitals are usually large establishments and in the state of Andhra Pradesh, we have about 40 Government teaching hospitals which include General, Maternity, Children, other specialities and super-speciality hospitals. Maternal care and deliveries are conducted in 18 of these 40 Government hospitals. These hospitals being

mostly tertiary care hospitals, the patients whose condition is the most serious are often sent here.

Pregnancy is a normal physiological process, but the outcomes vary from place to place and from one health care facility to another. The type of delivery, the status and weight of the new born and the maternal deaths are some of the factors we have analyzed in the 18 teaching hospitals in this study.

The type of delivery can be normal, assisted or Caesarean sections. Caesarean delivery is defined as the birth of a fetus through incisions in the abdominal wall (laparotomy) and uterine wall (hysterotomy). Caesarean section is the commonest obstetric operative procedure worldwide. In medical colleges and teaching hospitals in India the overall rate for caesarean deliveries is 24.4%.<sup>(2)</sup>

A baby can be born alive or as a stillbirth. Stillbirth as recommended by WHO for international comparison is a baby born with no signs of life at or after 28 weeks' gestation. Stillbirth is an adverse outcome in pregnancy. Stillbirth is a relatively rare adverse pregnancy outcome in developed countries but it is still high in our country.

Normal birth weight is any weight more than 2500 grams at the time of the birth of a baby. A baby can be born as normal or low birth weight. Most experts agree that weight at birth is an indicator of a newborn's chances for survival, growth, long-term health and psychosocial development. There is a significant variation in this prevalence across nations and various health care settings and the prevalence in south east Asia is around 31%.<sup>(3)</sup>

Pregnancy, although being considered a normal healthy state, carries serious risk of morbidity and at times death – maternal death. Currently in India it is estimated to be 254 per 1,00,000 live births.<sup>(4)</sup>

This paper is an attempt to analyze the type of deliveries being conducted at the Government Teaching hospitals and the outcomes of these deliveries in terms of Caesarean section rates, prevalence of stillbirths and low births, maternal mortality rate and the causes for the maternal deaths in these hospitals.

## METHODOLOGY

This is a retrospective study. Data records from all the 18 Government hospitals where deliveries were conducted were used for the period from April 2011 to March 2012. Out of the 18 hospitals, 7 are exclusively maternity hospitals. These being teaching hospitals, residents in the concerned speciality and speciality doctors are available round the clock. Data is meticulously recorded and stored. Data from all the 18 hospitals were collected, complied and analyzed. A total of 1,37,415 deliveries were conducted during this period in these hospitals and this study is based on the outcomes of these deliveries. Simple percentages and wherever appropriate rates were calculated.

## RESULTS

**Type of delivery:** Nearly 63% of the deliveries conducted were normal deliveries and the remaining were either assisted (5.9%) or Caesarean Sections (31.15%). (Table 1)

**Table 1: Type of Delivery**

Type of delivery	Number	Percent
Normal	86501	62.95
Assisted	8112	5.90
C-section	42802	31.15
Total	137415	100

**Type of Birth:** Since live births included even multiple births, the total number of births exceeded the number of deliveries. About 98.24% of the births were live and

1.76% were stillbirths (Table 2). This gives us a still birth rate of 17.6/1000 total births.

**Table 2: Type of Birth**

Type of birth	Number	Percent
Live birth	137941	98.24
Stillbirth	2476	1.76
Total	140417	100

**Prevalence of Low birth weight:** Low birth weight is defined as weight less than 2500 grams at the time of the birth of a baby. The prevalence of this was 11.43% in the babies born during this one year period in the 18 Government Hospitals.

**Table 3: Prevalence of Low Birth Weight**

Birth weight	Number	Percent
Low (< 2.5kgs)	15780	11.43
Normal	122161	88.57
Total	137941	100

**Maternal Deaths:** A total of 217 maternal deaths were reported during the one year period and the maternal mortality rate was calculated as follows:

Maternal Mortality Rate (MMR) = Number of maternal deaths/Number of live births  
 = 217/137941 X 100000 = 157/1,00,000 live births.

Thereby giving us a MMR of 157/1,00,000 live births.

As can be seen in Table 4, nearly two-thirds of the maternal deaths (64.52%) occurred during the post natal period and around 27% during the antenatal period. Few deaths took place at the time of labour.

**Table 4: Period of Maternal Deaths**

Number of deaths during	Number	Percent
Antenatal period	59	27.19
Intranatal period	18	8.29
Postnatal period	140	64.52
Total	217	100

**Cause of maternal deaths:** While analyzing the cause of the maternal death, the most common single cause was Pregnancy Induced Hypertension which included both pre-Eclampsia and Eclampsia (30.41%). The next most common cause was Haemorrhage (16.59%) (Table 5).

**Table 5: Cause of Maternal Deaths**

Cause of maternal deaths	Number* (217)	Percent
Anemia	20	9.22
Haemorrhage	36	16.59
Pregnancy Induced Hypertension/Eclampsia	66	30.41
Puerperal sepsis	11	5.07
Rupture of uterus	11	5.07
Embolism	22	10.14
Other (specify)	78	35.94

\*Multiple causes

## DISCUSSIONS

**Type of Delivery:** Nearly 63% of the deliveries were normal and 31% were by caesarean sections. The average global estimates for Caesarean sections as per a study done by Ana P Betran et al, <sup>(5)</sup> was around 15%, with rates being higher in Latin American and Caribbean countries and lower in developing countries. The World Health Organization recommends that the caesarean section rate should not be higher than 10% to 15%. <sup>(6)</sup> In a study of Caesarean Section (CS) rate in Latin American countries, 12 out of 19 countries studied had CS above 15% ranging from 16.8% to 40%. These 12 countries account for 81% of the deliveries in the region. Over 8,50,000 unnecessary caesarean sections are performed each year in Latin America taking 15% a medically accepted rate. <sup>(7)</sup> Having said that, the point to be noted here is that, the rates in the studies mentioned so far were for the overall Caesarean Section rates in all the hospitals and not specific to teaching hospitals and tertiary care centres, where usually the most serious and high risk cases are sent. Our study pertains to

exclusive teaching and maternity hospitals and hence reflected a higher prevalence rate for Caesarean Sections. In a study done in medical colleges and teaching hospitals in India the overall rate for caesarean deliveries was 24.4%.<sup>(2)</sup> Our study was close to this figure for caesarean sections done. In India, a study conducted by Bhasin et al,<sup>(8)</sup> showed an unacceptable high prevalence (34.4%) rate of caesarean section in east Delhi. In a population based cross sectional study conducted in Madras, the total caesarean section rates in the public, charitable and private sectors were 20%, 38% and 47% respectively.<sup>(9)</sup> In this study there was a lower rate of caesarean sections in the public hospitals compared to the present study, but that could have been because the present study included exclusive teaching hospitals where tertiary care is given and where usually most of the mothers with complications are referred to from the periphery rural hospitals and other private nursing homes.

**Type of Birth:** The definition of stillbirth as recommended by WHO for international comparison is a baby born with no signs of life at or after 28 weeks' gestation.<sup>(10)</sup> Stillbirth rate is an important indicator of access to and quality of antenatal and delivery care. The stillbirth rate in our study was 17.6/1000 total births. In a systematic review study on prevalence of stillbirths done by Lale Say et al,<sup>(11)</sup> they suggested that stillbirth prevalence at the community level is in general less than 1% in more developed parts of the world and exceeded 3% in less developed regions. As per the Family Welfare statistics of India 2011, the stillbirth rate for India was 8/1000 births and for Andhra Pradesh it was 11/1000 births.<sup>(12)</sup> While we do agree that the stillbirth rate is slightly higher in our settings, we cannot afford to lose sight on the fact that all our hospitals are tertiary care hospitals where the at risk mothers are sent

to. Most of the rates mentioned above of other studies are for the general population and not for tertiary care hospital. In a study done in a tertiary care hospital in Bangladesh, the stillbirth rate was 30.4/1000 births.<sup>(13)</sup> In yet another study in Nepal in a tertiary care hospital, it showed a stillbirth rate of 22.7/1000 births.<sup>(14)</sup> These rates are much higher than the stillbirth rate in our hospitals. A University Hospital in Denmark quoted an overall stillbirth rate of 4.57/1000 births.<sup>(15)</sup> Similar study in a large teaching hospital, the rate was 5.9/1000 births.<sup>(16)</sup> These being developed countries, the stillbirth rate are much lower than the rate in the present study. What we can understand from all these studies is that in developed countries the still birth rate is significantly lower than those in the developing county like ours. In the developed world reduction, in the stillbirth rate can be attributed to better access to vastly improve antenatal and natal care and revolution in neonatal care that enabled obstetrician to deliver a foetus, particularly remote from term, when its health was in jeopardy. Hence there is scope for improvement here in our setups.

**Prevalence of Low birth Weight:** Birth weight is an important determinant of child survival and development. World Health Organization has defined Low Birth Weight (LBW) as weight at birth of less than 2500 grams. There is significant variation in the incidence of LBW across regions. South Asia has the highest incidence, with 31% of all infants with LBW, while East Asia/Pacific has the lowest, at 7%. Nearly 40% of all LBW babies in the developing world are born in India.<sup>(3)</sup> The low birth weight prevalence in our study was 11.43% which is a comparatively lower figure. This could be because most of the mothers who come for delivery here have had regular antenatal checkups and proper support in the form of nutritional education and supplementation.

**Maternal Mortality:** Maternal mortality is defined as the death of any woman while pregnant or within forty two completed days of termination of pregnancy irrespective of duration or site of pregnancy from any cause related to or aggravated by pregnancy but not from accidental or incidental causes. Maternal mortality rate is defined internationally, as the maternal death rate per 1, 00,000 live births. <sup>(4)</sup> Maternal mortality is an index of effectiveness of obstetric services prevailing in a country. Currently it is estimated to be 254 per 1,00,000 live births in India, which is far above the desired figure of 100 per 1,00,000 live births as per the objectives of Millennium Development Goals (MDGs). <sup>(4)</sup>

In the present study MMR was 157/1,00,000 live births. Other studies from tertiary care institution reported mortality rate of 113 to 879 per 1,00,000 live births. <sup>(17-19)</sup> The majority of women in India don't deliver in hospital and therefore, the incidence and proportion of complications seen in tertiary care hospitals is probably very different from what occurs in the community. At the same time hospital data estimated may be more than community mortality rate as high risk women are referred to hospital for delivery and often the women are only transported to hospital when they develop life threatening complications, which is too late and swells the number of hospital deaths.

The highest percent of maternal deaths was in the post natal period (64.5%) followed by antenatal period (27.19%). This was similar to a study done by Anandalakshmy et al <sup>(20)</sup> where they reviewed the MMR of a tertiary hospital and the following were their findings; Of the 116 maternal deaths, 68 deaths had occurred post partum, 41 during pregnancy but prior to delivery and seven had occurred during labor.

In our study the most common causes of maternal deaths were Pregnancy Induced Hypertension (30.41%), Haemorrhage (16.59%) and Pulmonary Embolism (10.14%). However, in a study done by Anandalakshmy et al, <sup>(20)</sup> they found that sepsis was the leading cause (35.3 %), followed by toxemia (16.4 %) and hemorrhage (2.6 %). The classical triad of infection, toxemia and hemorrhage accounted for more than half (54.3 %) of all maternal deaths. In our study the classical triad accounted for more than 50% of all the maternal deaths which is close to the above study. In another study done by Nishu Priya et al <sup>(21)</sup> Post Partum Haemorrhage was the leading cause of maternal mortality (35.05%) followed by PIH (27.83%). Anaemia was the indirect cause in 25.7%.

## CONCLUSION

We would like to conclude by saying that in spite of the high number of deliveries and at risk mothers who are handled by our Government teaching hospitals and maternity hospitals, the stillbirth rate and number of maternal deaths are comparatively low for the rates prevailing in our country. To save lives, many a times caesarean sections have to be performed as an emergency procedure. Low birth prevalence too is low in our settings. However, there are still many areas of improvement in our hospitals by which we can reduce the maternal deaths and lower the still birth rate and caesarean section rates.

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How to cite this article: Padmaleela K, Thomas V, Prasad KV. An Analysis of the Institutional Deliveries and Their Outcomes in Government Teaching Hospitals of Andhra Pradesh, India. *Int J Health Sci Res*. 2013;3(5):76-81.

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