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PREVALENCE OF ADVERSE PREGNANCY OUTCOMES: A COMMUNITY BASED LONGITUDINAL STUDY

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ABSTRACT: BACKGROUND: In most developed countries, pregnancies are planned, complications are few and outcomes are generally favorable for both mother and infant. But in developing countries, adverse pregnancy outcomes are far more frequent due to various reasons. The most severe adverse outcome of pregnancy is the death of the mother or her offspring. Over the years maternal and child health programmes are striving to improve the health status of pregnant women and neonates. However, the adverse pregnancy outcomes (Maternal and Neonatal) still remain high. **OBJECTIVE:** To study the prevalence of adverse pregnancy in the study area. **METHODOLOGY:** A community based longitudinal study was carried out in the 36 villages of Kaiwara from January 2011 to December 2011. All the antenatal mothers were traced through Anganwadi records maintained at different villages. They were contacted at their residence and the questionnaire was administered in their local language. The questionnaire was administered during three different visits to collect information regarding socio-demographic details, pregnancy outcomes. The first visit was made before delivery and subsequently second and third visits were made within 7 days and 42nd day after delivery respectively. Maternal and child protection cards were used to validate the collected information. Statistical analysis was performed using SPSS software version 18.0 **RESULTS:** The present study revealed that, the proportion of low birth weight in the study area was 31.9% (95% CI=25.74-38.06), preterm birth 20.5% (95% CI=15.28-25.72), postnatal complications 5% (95% CI=14.819-9.181), abortion 2.1% (95% CI=0.25-3.95), maternal death 0.4% (95% CI=0.416-1.216) and neonatal death 0.4% (95% CI=0.416-1.216). **CONCLUSION:** The present study revealed that the proportion of adverse pregnancy outcomes was in par with the national average.
KEYWORDS: Longitudinal study, Adverse pregnancy outcome, Low birth weight.

INTRODUCTION: One of the important millennium development goals set in the year 2000 was three-quarters reduction in maternal and infant mortality rates by the year 2015. Maternal mortality is unacceptably high at global level. About 800 women die from pregnancy-or childbirth-related complications around the world every day. Most of these deaths (Around 99%) occur in developing countries and it is higher in women living in rural areas and among poorer communities.[1] India is among those countries which have a very high maternal mortality rate. However, there is a decline in MMR estimates in 2007-09 over 2004-06: 212 from 254 (a fall of about 17%). [2]

Worldwide, 7.6 million children under the age of five die every year. A child's risk of dying is highest in the neonatal period, especially during the first 28 days of life. Safe childbirth and effective neonatal care are essential to prevent these deaths. About 40% of child deaths under the age of five take place during the neonatal period.[3] Neonatal survival is a very sensitive indicator of population growth and socio-economic development. Each year in India, over one million newborn die before they complete their first month of life, accounting for 30% of the world's neonatal deaths. India's current neonatal mortality is 32 per 1000 live births,[4]

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In most developed countries, pregnancies are planned, complications are few and outcomes are generally favourable for both mother and infant. Adverse outcomes are far more frequent in the developing world. The most severe adverse outcome of pregnancy is the death of the mother or her offspring.[5] Adverse outcomes of pregnancy could be in the form of abortion, still birth, preterm birth, low birth weight, and postnatal complications. The programs within maternal and child health section are striving consistently to improve the health status of pregnant women and neonates. However, the adverse pregnancy outcomes (Maternal and Neonatal) still remain high.

Most studies conducted on pregnancy outcomes are hospital-based; not reflecting the true situation in the community. Hence, this study was undertaken to study the adverse pregnancy outcomes and their associated risk factors among antenatal mothers in rural area. This would throw light on ground realities of antenatal care services, which would help the healthcare providers to strengthen maternal and child health care services. Hence, this study was carried out to assess the proportion of adverse pregnancy outcomes.

MATERIALS AND METHODS:
Study Area: This study was conducted in the administrative limits of primary Health Centre (PHC), Kaiwara under Chintamani Taluk, Chikkaballapur District which is situated about 75kms from Bangalore city. The Kaiwara PHC catered to a population of 35,290 people as per 2001 census (PHC data) living in 36 surrounding villages.

Sample Size: The sample size for the present study was calculated using proportion of low birth weight which is one of the predominant adverse pregnancy outcomes. It has been reported by UNICEF that proportion of low birth weight babies in India is 28%. Assuming the above findings, the sample size for the present study was calculated with a relative precision of 20% and confidence level of 95%. The sample size was estimated to be around 257. As per 2001 census, Population of Kaiwara PHC was 35,290. Considering the birth rate of India, which is 21/1000 population, it was expected that 741 live births would occur in one year in Kaiwara. Hence 6 months period (i.e. June 2010 to December 2010) was considered for recruiting the mothers to meet the required sample size.

METHODOLOGY: All the antenatal mothers who were residing in the study area and had registered between June 1st 2010 to December 31st 2010 and expected to deliver after January 31st 2011 and who were available for follow up till 42 days after delivery were included for the study. All antenatal mothers who met the inclusion criteria were prospectively enrolled for the study. The mothers were traced through Anganwadi records maintained at different villages. They were contacted at their residence and after establishing a good rapport, an informed consent was obtained and the questionnaire was administered in their local language.

The questionnaire was administered during three different visits. The first visit was made before delivery. The second and third visits were made within 7 days and 42nd day after delivery respectively. Maternal and child protection cards and discharge summary (Where available) were used to validate the collected information. Socio-demographic variables were collected from each of the study subjects. Age was ascertained by available records (Voter ID/ Ration card etc). Individuals were classified into various socio-demographic strata by using modified B G Prasad classification.[6]

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First Visit (Before Delivery): During the first visit, information pertaining to demographic details, present pregnancy details, menstrual history, previous obstetric history, past medical history, personal history was collected. Information pertaining to basic investigations was also collected. Mothers were checked for pallor on the nails, conjunctiva, tongue and palate. Height, weight and blood pressure was recorded. Fundal height was measured to determine the gestational age. The size and shape of the nipples were observed for inverted nipples and the pregnant women were advised accordingly.

Second Visit (Within 7 days): Information pertaining to basic investigations, delivery details of the present pregnancy and details regarding birth weight, immunization history were collected.

Third Visit (After 42 days): Details pertaining to post natal visits by health workers, postnatal complications were collected during this visit.

In the present study, abortion, low birth weight, preterm birth, maternal death, neonatal death, still birth and postnatal complications were considered as adverse pregnancy outcomes.

Operational definitions evolved by the investigator were used to identify the adverse pregnancy outcomes during the second and third visits.

Statistical Analysis: The data was tabulated in an excel sheet. Proportion of various adverse outcomes per 1000 live births was estimated based on the results of the present study, along with 95% confidence interval. Quantitative variables such as age, parity, gestational week were summarized in terms of mean, median and Standard deviation.

RESULTS: The total number of subjects included for the present study was 257. The number of mothers available for complete follow up was 239. There was loss to follow up rate of 8%. (Three visits were made before considering them as loss to follow up). It was observed that mean age of antenatal mothers was 22.5±2.97 years. Majority of the study participants belonged to Hindu religion (94%) and only a few of them belonged to Muslim religion (6%). Majority (59.4%) of the study participants belonged to nuclear family, and 41% belonged to non-nuclear family (Table 1).

Distribution of study participants according to antenatal care received, delivery details and post care received is shown in table 2 and 3.

It was evident from the present study that, the proportion of low birth weight in the study area was 31.9% (95% CI=25.74-38.06), preterm 20.5% (95% CI=15.28-25.72), postnatal complications 5% (95% CI=14.819-9.181), abortion 2.1% (95% CI=0.25-3.95), maternal death 0.4% (95% CI=0.416-1.216) and neonatal death 0.4% (95% CI=0.416-1.216). (Table 4).

DISCUSSION: It was observed that 2.1% (95% CI: 0.25-3.95) of the study population experienced abortions during pregnancy. The abortions were spontaneous in nature. According to survey on "pregnancy outcomes in Tamilnadu" conducted by Krishnamurthy et al[5] the percentage of spontaneous abortions was 8.9% In the present study, the study participants were recruited at different trimesters and only 34% of the mothers were recruited in first trimester, which can be attributed for under estimation of abortion rates.

It was observed that proportion of low birth weight was 31.9% (95% CI: 25.74-38.06) which coincided with the national average. According to UNICEF (2009) proportion of low birth weight in

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India was 28%. The findings were similar to studies conducted by Deshmukhet al[7]in Nagpur, India and Chaudhuri et al[8] in Kolkata, India which showed that the prevalence of low birth weight was 30.3% and 28.6% respectively. However, the prevalence of low birth weight varied in different studies. A study conducted by Velankaret al[9], in urban slums of Mumbai, India showed that the percentage of mothers who gave birth to low birth weight babies were 42.5%. In a retrospective study conducted by Singh et al,[10] in Amritsar, India from July 2005 to Jun 2006, the frequency of low birth weight babies was 6.16%. A study conducted by Bang et al[11] in Gadchiroli, India showed that, the prevalence of low birth weight among neonates was 42%.

Although infant mortality rate is the primary health indicator, low birth weight (LBW) is also an indicator of considerable interest. Babies having a birth weight of 2500 grams or less are known to have poor health and therefore poor chance of survival, high mortality in childhood. Poor health of mothers which is directly related to higher incidence of LBW babies is also responsible for maternal mortality, and is an indicator of poor health status of mothers in the society.[12]

In the present study the proportion of preterm births was 20.9% (95% CI: 15.28-25.72).

The findings were similar to a study conducted by Uma et al[12] in Lucknow which revealed that the incidence of preterm labor was 22%. And preterm rupture of membranes and infection were the commonest causes of preterm labor.

In the present study it was observed that, of the 239 study participants, one of them died and the cause for maternal mortality was eclampsia, which is one of the major causes of maternal mortality in India. According to the Census 2011, India, maternal mortality ratio for the country is 212 per one lakh live births[13].A retrospective study conducted by Bhattacharya etal[14] in Kolkata, estimated a maternal mortality ratio (MMR) of 599 per 100 000 live births.

In the present study it was observed that, neonatal mortality rate was 0.4% which is more than the national average and the cause for mortality was low birth weight. According to UNICEFF, the neonatal mortality rate in India is 32 per 1000 live births.[15]

A study conducted by Sarnaet al,[16] showed that neonatal mortality rate was 44.87 per 1000 live births.

The present study showed that, 5% of the study participants during postnatal period experienced one or more postnatal complications. It was observed that 5% of them had puerperal pyrexia, 0.9% puerperal sepsis, 1.3% urinary tract infection, and 0.4% breast engorgement.(Table 4)

CONCLUSION: The present study revealed that the proportion of adverse pregnancy outcomes is almost similar among the women in the study area compared to national average. It was evident from the present study that, the proportion of low birth weight in the study area was 31.9% (95% CI=25.74-38.06), preterm 20.5% (95% CI=15.28-25.72), postnatal complications 5% (95% CI=14.819-9.181), abortion 2.1% (95% CI=0.25-3.95), maternal death 0.4% (95% CI=0.416-1.216) and neonatal death 0.4% (95% CI=0.416-1.216).

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Education	Antenatal mother No. (%)	Husband No.(%)
Graduate	9(3.8)	17(7.1)
Intermediate/diploma	81(33.9)	98(41.0)
High school	40(16.7)	43(18.0)
Middle school	18(7.5)	26(10.9)
Primary school	13(5.4)	11(4.6)

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Not literate	78(32.6)	44(18.4)
Total	**239(100.0)**	**239(100.0)**
Occupation	**Antenatal mother No. (%)**	**Husband No.(%)**
Semi-professional	0	5(2.1)
Clerical/shop/farm	1(0.4)	3(1.3)
Skilled worker	1(0.4)	42(17.6)
Semi-skilled worker	15(6.3)	147(61.5)
Unskilled worker	45(18.8)	35(14.6)
Unemployed	177(74.1)	7(2.9)
Total	**239(100.0)**	**239(100.0)**
Socio-economic status	**No. (%)**	
Upper high	7(2.9)	
High	24(10.0)	
Upper middle	26(10.9)	
Lower middle	49(20.5)	
Poor	133(55.6)	
Total	**239(100.0)**	

Table 1: Distribution of study participants according to socio-demographic details

Variable	Level/Factor	n (%)
Place of delivery	Home	5(2.1)
	Hospital	229(97.9)*
	Total	**234(100.0)**
Type of hospital/Health care facility where delivery was conducted	PHC	67(29.3)
	Taluk hospital	126(55.0)
	District hospital	21(9.2)
	Tertiary hospital	2(0.9)
	Private hospital	13(5.7)
	Total	**229(100.0)***
Personnel who conducted delivery	Doctor	214(91.5)
	Public health nurse	9(3.8)
	Trained dai	8(3.4)
	Untrained dai	3(1.3)
	Total	**234(100.0)**
Type of delivery	Normal	186(79.5)
	Assisted	1(0.4)
	Caesarean	47(20.1)
	Total	**234(100.0)**

Table 2: Distribution of study participants according to delivery details (n=234)

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Postnatal visits by health care worker at home	Yes n (%)	No n (%)	Total
Within 10days	210 (90.10)	23 (9.9)	233* (100.0)
Within 6wks	185 (79.4)	48 (20.6)	233* (100.0)
Table 3: Distribution of study subjects according to postnatal care received (n=233)			

*one subject was excluded as there was maternal death.

Adverse Pregnancy Outcome	Yes n (%)	95% CI
Abortion	5(2.1)	(0.25-3.95)
Low birth weight *	73(31.9)	(25.74-38.06)
Preterm	49(20.5)	(15.28-25.72)
Maternal death	1(0.4)	(0.416-1.216)
Neonatal death	1(0.4)	(0.416-1.216)
Postnatal complications	12(5)	(14.819-9.181)
Table 4: Proportion of adverse pregnancy outcomes among the study population (n=239)		

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