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Original Research Article

Outcome of pregnancy among high risk pregnancies in rural area of Nagpur, Maharshtra, Central India

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ABSTRACT

Background: All pregnant women, by virtue of their pregnancy status, face some level of maternal risk. Some pregnancies are complicated by problems associated with mother's health. Most maternal morbidities could be prevented if mother had access to appropriate and timely healthcare during pregnancy. Study was intended to find out prevalence of high risk pregnancy and pregnancy outcome among them in rural area of Nagpur district, Central India.
Methods: Community based observational descriptive study was conducted on consecutive sample of 214 pregnant women, who had 20 weeks and above gestational period.
Results: Prevalence of high risk pregnancy observed was 33.64% (95% CI 27.31%-39.97%). Caesarean section (OR=7.63, 95% CI=4.04-14.40, P=0.0001) and birth weight less than 2500gm (OR= 3.47, 95% CI=1.47-8.20, P=0.003) were significantly associated with high risk pregnancy. Mode of delivery caesarean section had strong relationship with previous history of caesarean section (OR=37.53, 95% CI=8.64-163.05, P=0.0001) and mothers height less than or equal to 140cm (OR=8.87, 95% CI=1.02-77.32, P = 0.0183). Pregnancy outcome low birth weight was significantly associated with oligohyramnios (OR = 8.45, 95 % CI=1.61-44.48, P=0.003) and history of caesarean section (OR=2.67, 95 % CI=1.01-7.07, P = 0.041).
Conclusions: Prevalence of high risk pregnancy was almost one-third in pregnant women in rural area of central India. Mode of delivery caesarean section and birth weight less than 2500gm was significantly associated with high risk pregnancy. History of caesarean section and height less than or equal to 140 cm influence the outcome of pregnancy i.e. caesarean section. Birth weight, LBW (Low Birth Weight) was associated with history of caesarean section and oligohyramnios.

Keywords: Gestational period 20 weeks and above, High risk pregnancy, Low birth weight, Mode of delivery caesarean section, Pregnancy outcome, Rural area

INTRODUCTION

Pregnancy itself is normal physiological condition and not a high-risk condition. Though most of pregnancies have healthy, happy outcome; some pregnancies are complicated by problems with mother's health, the health of the foetus or complications unique to pregnancy. These pregnancies are at "high risk" for developing problems and having a poor outcome.[1] Although only 10-30% of the mothers seen in antenatal period can be classified as high risk they account for 70-80% of perinatal mortality and morbidity. Therefore, special care is needed to assure the best possible outcome for mother and child.[2] Despite recent advances in modern obstetrics and neonatal care, India is still facing a high perinatal mortality rate of 33/1000 live births (Registrar General India, 2012). Perinatal outcome can be changed significantly by early detection followed by special

intensive care of high risk pregnancies.[3] Research has shown that small and affordable measures can significantly reduce the health risks that women face when they become pregnant. Most maternal morbidity and mortality could be prevented if women had access to appropriate and timely health care during pregnancy, childbirth, and immediately afterwards.[4] Communities and families have a major role to play in making that access possible and in protecting women's health through improved nutrition and the prevention of unwanted pregnancy. For safe pregnancy and childbirth, access to available services is a fundamental right for women. It is necessary to give special attention for high risk group which will reduce perinatal and maternal mortality and morbidity. Very few community based studies in rural setting are available on this topic. It is need to study outcome in high risk pregnancy which will be helpful for future health planning to avoid poor outcome and to improve the management of high risk pregnancy in rural population.

Present observational descriptive study was undertaken to find prevalence of high risk mothers and their pregnancy outcomes in rural area of Nagpur districts in central India.

METHODS

Present observational descriptive study was conducted in Nagpur district of central India. In this district Patansawangi primary health centre (PHC) was selected purposively considering convenience and feasibility. The PHC was about 28 km away from study institution. It was situated in field practice area of Rural Health Training centre of study institution, this area was surrounded by various coal mines. The study was intended to find out prevalence of high risk pregnancy and outcome of pregnancy. Study period from May 2014 to April 2015. Sample size estimated using formula, $n= 3.84pq/d^2$, with assumption prevalence of high risk pregnancy (p) 31.4% (Bharati et al5), (q=1-p), acceptable margin of error (d) 20% and level of significance 95% comes out to be 210. However data was collected from 214 subjects.

Ethical consideration

Ethical clearance from the Institutional Ethics Committee was obtained prior to study. Permission from District Health Officer was obtained for conduct of study. Informed consent was taken from each of the study participants after explaining the nature and purpose of the study and its potential benefit and expected duration of study.

Methodology

Nagpur district has 13 rural and 1 urban blocks. From 13 rural blocks, one of the blocks (Saoner) was selected in that district. There were 5 Primary Health Centers in selected block. Out of them Patansawangi PHC was purposively selected. Patansawangi PHC was having 7 sub centers and 29 villages with population of 48,418. As per NFHS -3 the birth rate of selected district in rural area is 17.4 per 1000 population hence expected pregnancies in a year will be 842 which will fulfil required sample size.[6]

Consecutive sample of eligible pregnant women (20 weeks and above gestation) was selected for examination at Anganwadi in each village of sub centre and sub centre were selected one after another till sample size was completed. Required sample size was completed in 6 sub centres, Isapur 41, Kathodi 35, Pipla Dag Bangla 23, Waki 15, Sawarmendha 18 and Malegaon 82. Estimated sample size was 210 study subjects but actually 214 study subjects were taken because all study subjects in last village were included in the study. Pregnant women were called for pre planned and pre informed visit to Antenatal Care clinic (ANC) for examination with the help of Auxiliary Nurse Midwife (ANM), multipurpose worker (MPW), Anganwadi worker (AWW) / ASHA. The pregnant women 20 weeks and above gestational period, who could not come for schedule ANC examination at sub centre or anganwadi was contacted with the help of ANM, MPW, AWW or ASHA at her home. All pregnant women consented to participate in study. Information was recorded in predesigned and pretested proforma by personal interview.

In every month according to pregnant women's expected date of delivery (EDD) respective pregnant women, or ANM/MPW, AWW or ASHA was contacted on telephone to know about mode of delivery, place of delivery, outcome of delivery, date of delivery and birth weight of new born. Validity of telephonically procured data was cross checked from records. If any information could not be obtained on telephone due to any reason, then home visit was paid to such participant to know the outcome of pregnancy. Then this information was recorded in the proforma for individual subject. Pregnancy outcome information of all 214 study subjects was obtained. Physical examination of pregnant women was done and parameters like weight, height and blood pressure etc. were recorded. Body weight was measured without shoes to the nearest 0.1 kg using the electronic weighing machine.[7] Height of the subjects were measured using flat straight scale to the nearest 0.5cm.[7] Blood pressure was recorded by sphygmo-manometer, three readings were taken 5 minute apart and average of three readings was calculated.[8] Haemoglobin was estimated by Sahli's method.[9] Urine was checked for albumin and sugar by dip stick method.[9] Test for random blood sugar was carried out by Accu-Check Glucometer, if it was found more than 140mg/dl then fasting blood sugar and 2 hour post meal blood sugar was tested next day morning for confirmation of GDM.[10-12]

Statistical analysis

Data was entered in MS- Excel (2013) and analyzed using statistical software Epi Info 7 (2014). Descriptive

statistics (percentage, mean, standard deviation, range) were used to summarize baseline characteristics of the study subjects.

Association between two categorical variables was analyzed by using Chi-square test and Fisher exact test. Odds ratio (OR) and 95% Confidence Interval (CI) were calculated. P value <0.05 was considered to be statistically significant.

RESULTS

Present community based observational descriptive study was carried out in rural area to estimate the prevalence of high risk pregnancy and outcome of pregnancy among them.

Table 1: Characteristics of study subjects.

Characteristics		Study subjects (n=214)	
		No.	%
Age in years	≤20	14	06.55
	21-25	141	65.89
	26-30	56	26.16
	>30	03	01.40
Parity*	Nulliparous	110	51.40
	One	84	39.25
	two	20	09.35
Gestational term at birth	Pre term	70	32.71
	Full term	142	66.36
	Post term	02	00.93
Birth weight in gm	<2000	01	00.47
	2000-2499	24	11.21
	2500-2999	108	50.47
	≥3000	81	37.85

*Distribution at the time of registration of study subjects, before delivery.

Total 214 mothers were included in the study. Characteristics of study subjects are presented in Table 1. Mean age of pregnant women was 24.42±2.72 years with range of 19-34 years. Most of the study subjects, 207 (96.73%) were literate. Mean height of study subjects was 152.41±5.88 cm with range of 136-168 cm. Mean weight of pregnant women was 52.94±8.09kg with range of 35-84 kg. Seventy two study subjects were having one or more risk factors. Prevalence of high risk pregnancy was observed to be 33.64% (95% CI 27.31-39.97%).

There were 142 (66.36%) study subjects with low risk pregnancy having no known risk factors. Distribution of these risk factors was: history of caesarean section 31 (14.49%), malpresentation 17 (7.94%), teenage pregnancy 14 (6.54%); pregnancy induced hypertension, oligohyramnios, height less than or equal to 140cm and weight less than or equal to 40kg 6 (2.80%) each.

History of still birth and associated diseases was 4 (1.87%) each. Gestational diabetes, age more than 30years in primi-gravida, history of congenital anomalies, prolong pregnancy and history of more than or equal to two abortions was 2 (0.93%) each. History of ectopic pregnancy and severe anaemia was one each (0.47%).

Table 2: Pregnancy outcome in study subject.

Pregnancy outcome		Study subjects	
		No.	%
Mode of delivery	LSCS	80	37.38
	Normal	134	62.62
Place of delivery	Home	2	00.93
	Institutional	212	99.07
Outcome of delivery	Live birth	2	00.93
	Still birth	212	99.07
Birth weight of newborn	<2500 gm	25	11.68
	≥2500 gm	189	88.32

Table 3: Relationship of high risk pregnancy with pregnancy outcome in study subjects.

Pregnancy out come	High risk (n=72)		Low Risk (n=142)		OR (95% CI)	X^2, df=1	P
	No.	%	No.	%			
Mode of delivery							
LSCS	49	68.06	31	21.83	7.63 (4.04-14.40)	43.61	0.0001
Normal	23	31.94	111	78.17			
Place of delivery							
Home	01	1.39	01	0.70	1.99 (0.12-32.22)	0.241	0.60
Institutional	71	98.61	141	99.30			
Outcome of delivery							
Still Birth	01	1.39	01	0.70	1.99 (0.12-32.22)	0.241	0.60
Live birth	71	98.61	141	99.30			
Birth weight							
LBW	15	20.83	10	7.04	3.47 (1.47-8.20)	8.807	0.003
Normal	57	79.17	132	92.96			

Table 2 shows the pregnancy out come in study subjects. In 80 (37.38%) mode of delivery was by caesarean section. Birth weight less than 2500gm was 25, means prevalence of low birth weight was 11.68%. Table 3 shows relationship of high risk pregnancy with pregnancy out come. Mode of delivery caesarean section and birth weight less than 2500gm was significantly associated with high risk pregnancy.

Caesarean section (OR= 7.63, 95% CI = 4.04-14.40, P = 0.0001) and birth weight less than 2500gm (OR= 3.47, 95% CI = 1.47-8.20, P = 0.003) were significantly associated with high risk pregnancy. Out of 31study subjects having risk factor history of caesarean section, mode of delivery was caesarean section in 29 study subject. Mode of delivery had strong relationship with previous history of caesarean section (OR = 37.53, 95% CI = 8.64-163.05, P = 0.0001) and mothers height less than or equal to 140cm (OR = 8.87, 95% CI = 1.02-77.32, P = 0.0183).

Among 6 subjects who had had height less than or equal to 140 cm, 5 mode of delivery was caesarean section. Other risk factors were not found associated with caesarean section as mode of delivery. Out of 6 study subjects having risk factor oligohyramnios was associated with low birth weight in 3 study subjects. Pregnancy outcome low birth weight was significantly associated with oligohyramnios (OR = 8.45, 95% CI = 1.61-44.48, P = 0.003) and history of caesarean section (OR = 2.67, 95% CI = 1.01-7.07, P = 0.041). History of caesarean section was in 31 study subjects associated with low birth weight in 7 subjects. Other risk factors were not found associated with low birth weight.

DISCUSSION

Present observational descriptive study was conducted in Nagpur district of central India. In Nagpur district, Patansawangi, India. Primary Health Centre (PHC) was selected purposively considering convenience and feasibility. The PHC was about 28 km away from study institution. It was situated in field practice area of rural health training centre of study institution. Aim of present study was to find prevalence of high risk mothers and their outcomes. Total 214 study subjects were included in this study. Most of the study subjects i.e. 141 (65.89%) were in age group of 21- 25 years and 14 (6.54%) were teenagers. Mean age of study subjects was 24.42+2.72 years.

Present study found that prevalence of high risk pregnancy was 33.64% (95% CI 27.31-39.97%). The finding is consistent with findings of some Indian and world studies like Bharati et al (31.4%), Parmar D et al (27.89%), Oyibo P et al (35.1%), Paudel I et al (30.8%), Nosseir S et al (27.7%).[5,13-16] Higher prevalence was found in study conducted by Ranmale D et al (57.8%), Swains S et al (44.5%), Deshmukh M et al (50%), Dutta P et al (44.6%), Kashani E et al (63.5%), Sam F et al (63.5%) while lower prevalence of high risk pregnancy was found in studies like Mishra P et al (20%), Samiya M et al (15%), Akthar H et al (4.5%).[17-25]

Current study reported that 37.38% women underwent caesarean section as the mode of delivery and 62.62% were normal vaginal deliveries. Iyengar K et al conducted community based study which reported very less percentage (2.2%) of caesarean section as compared to (97.8%) normal vaginal deliveries.[26] Akthar H et al revealed that more than half (70.8%) of total deliveries were by caesarean section whereas proportion of normal and forceps deliveries was (29.2%).[25] Present study reported percentage of caesarean section more than national level.

Current study shows that proportion of caesarean section was higher in study subjects with high risk pregnancy 68.06% as compared to those with low risk 21.83%. This difference was statistically highly significant (OR=7.63, 95% CI=4.04-14.40, P<0.0001). Similar finding was reported in study done by Kashani E et al proportion of caesarean section was higher in study subjects with risk factor (79.6%) than proportion of caesarean section in study subjects without risk factor (20.4%).[21] Samiya M et al showed high proportion (32.5%) of caesarean section in case group as compared to proportion (2.5%) in control group.[24] Proportion of caesarean section was higher in present study probably due to better management of pregnancy and foetal survival.

In present study most of the study subjects (99.07%) delivered in health institutes, only (0.93%) study subjects delivered at home. Different finding was reported in study conducted by Garg R et al in Punjab.[27] They noticed 33.9% institutional deliveries whereas percentage of home delivery was 66.1%. Also Khatib N et al carried out study in rural Maharashtra which showed 68.6% institutional deliveries and 31.4% home deliveries.[28] Oyibo P et al reported very less percentage of institutional deliveries (20.5%) and maximum (79.5%) home deliveries.[14] Health and family welfare statistics in India 2013, shows 96.3% and 82.9% institutional deliveries in Maharashtra and India respectively.[29] As per DLHS-4, percentage of institutional deliveries was 92.3% and home deliveries 7.7% in Maharashtra.[30] NFHS-3 reported only 41% institutional deliveries.[6] It shows very less percentage as the survey was done ten years back. High percentage of institutional delivery in present study can be explained owning to better implementation of Janani Surksha Yojana, high female literacy rate and approachable heath facilities.

Present study showed that there was no difference between place of delivery in high risk and low risk pregnancy (P = 0.6). Proportion of delivery in health institute and home delivery was same in high risk and low risk groups. i.e. 98.61% in high risk and 99.30% in low risk group delivered at health institute, different findings were observed in study conducted by Hagos

Godifey.[31] He noticed that percentage of institutional delivery (55.2%) was higher in high risk pregnancy than in low risk pregnancy (44.8%) and difference was statistically significant (P=0.01). Health awareness and availability of health institutes in study area may be the reason for no difference in present study.

In the present study proportion of still birth was 0.93% and most 99.07% of the delivery outcome was live births. Government of India (2013) sample registration system (SRS) statistical report shows still birth rate of India as (5%) in rural area.[32] As per DLHS-4 still birth rate in Maharashtra is (1%), but Health and family welfare statistics in India 2013, reports still birth rate in Maharashtra as 1.5%.[29,30] Present study reported very low still birth rate as compared to national level rate but it was similar to still birth rate of Maharashtra. In study conducted by Khatib N et al in rural Maharashtra similar result i.e. still birth rate 1.4% was reported.[28] Rashami K et al (2.9%), Akthar H et al (3.5%) reported high still birth rate as compared to present study.[25,33] Present study showed that there was no difference between outcome of delivery as stillbirth, in high risk and low risk pregnancy (P = 0.6).

Current study reported 32.71% pre term deliveries whereas 0.93% deliveries were post term and rest of deliveries were full term deliveries. Different findings were observed in study done by Parmar D et al preterm delivery rate was (0.2%) and post term delivery rate was (0.2%).[13] Whereas Ranmale D et al showed (0.6%) preterm deliveries and (2%) post term deliveries. Bharati et al reported (11.6%) preterm deliveries, Samiya M et al noticed higher proportion of pre term delivery in case group (15.8%) as compared to proportion in control group (2%).[5,17,24] Thus proportion of pre term delivery in current study was higher than other studies.

This study reported higher proportion of pre-term deliveries in low risk group 34.7% as compared to high risk group 27.7%. But difference was not significant (P= 0.27). Akthar H et al noticed proportion of pre-term delivery was (17.6%) which was lower than the proportion of pre term delivery in this study.[25]

Present study revealed that mean birth weight of new born was 2865.71gms. Alexander A et al reported similar finding of mean birth weight in rural Southern India. Prevalence of low birth weight in present study was 11.38% which was lower than UNICEF (2009) report in India.[34,35] Lower prevalence of low birth weight may be due to higher socioeconomic status of most of study subjects and high literacy rate leading to improved nutritional status.

Present study showed proportion of low birth weight 20.83% in high risk pregnancy was higher than proportion 7.04% in low risk group. Difference was found to be statistically significant (OR = 3.47, 95% CI = 1.47-8.20, P=0.003). Akthar H et al reported lower proportion (6.6%) of low birth weight in high risk pregnancies than current study.[25] Present study revealed that there was increased proportion of low birth weight with increased risk during pregnancy.

CONCLUSION

Prevalence of high risk pregnancy was almost one-third in pregnant women in rural area of central India. Caesarean section as a mode of delivery is much higher (37.38%) than national average. Institutional delivery rate in study area is high 99.07%. Stillbirth rate is less than 1%. Prevalence of low birth weight babies is 11.37% found to be lower than national average. Mode of delivery caesarean section and birth weight less than 2500gm was significantly associated with high risk pregnancy. History of caesarean section and height less than or equal to 140 cm influence the outcome of pregnancy i.e. caesarean section. Birth weight, LBW (Low Birth Weight) was associated with history of caesarean section and oligohyramnios.

Though our study revealed improvement in institutional delivery rate and reduction in low birth weight rate in rural area but high caesarean section rate observed in this study emphasize the need to give special attention to high risk mothers. Majority of maternal morbidities could be prevented if mother had access to appropriate and timely healthcare during pregnancy in rural health care settings.

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Ethical approval: The study was approved by the Institutional Ethics Committee. Permission from District Health Officer was obtained for conduct of study

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