

Original research article**Risk factors associated with maternal morbidity in a maternity home hospital Bangalore: A longitudinal study****¹Dr. Prakruthi RA, ²Dr. DH Ashwath Narayana, ³Dr. Nandini RC**¹Assistant Professor, Department of Community Medicine, SABVMCRI, Bangalore, Karnataka, India²Medical Superintendent, Department of Community Medicine, KIMS&RH, Bangalore, Karnataka, India³Assistant Professor, Department of Community Medicine, BRAMC, Bangalore, Karnataka, India**Corresponding Author:**Dr. Prakruthi RA (ra.prakruthi@gmail.com)**Abstract**

Introduction: The mother and child are often spoken of in one breath and their health are also closely related one another. Early identification of risk factors is important to develop comprehensive intervention, strategies in preventing maternal morbidities. Hence the present study was undertaken.

Methodology: A longitudinal study was conducted in a maternity home Hospital which is attached to a medical college with a sample of 250 for a period of 1 year. All 2nd and 3rd trimester pregnant women after filling inclusion and exclusion criteria were included in the study. subjects were interviewed using a pre-tested; semi structured proforma, which had details on socio-demographic variables, obstetric history, history of risk factors, obstetric morbidity, details of emergency referral were recorded and were followed till there postnatal period. Data was entered in MS excel and statistical tests were applied using SPSS v-20.

Results: Among 250 study subjects, majority (46.4%) were in the age group of 21-25 years and mean age \pm SD was 23.7 \pm 3.7 years. Most of them were Hindu by religion i.e. 166 (66.4%), primi-gravida were 108 (43.2%) and 56.8% were multi-gravida. Majority 40 (16 %) consumed less than 100 IFA tablets and 210 (84%) had taken more than and equal to 100 IFA tablets.

Conclusion: The most common risk factors identified among the study subjects were family history of hypertension, diabetes mellitus and previous caesarean section. Timely identification of the risk factors acts as a road map for reduction in maternal mortality

Keywords: Pregnant women, risk factors, pregnancy induced hypertension

Introduction

Health of women and children has always been an important social goal of all societies and it realized that, improved maternal and child health is the key ultimate objective of lifelong health in any society. The mother and child are often spoken of in one breath and their health are also closely related one another^[1]. Maternal death have been described as the tip of the iceberg and maternal morbidity as the base. Many women do not die of causes related to pregnancy but suffer severe morbidities. As the rapidly growing population has become a major concern for health planners and administrators in India since independence. In regard to this, there was launching of several programmes related to maternal and child health from time to time and updates its strategies in order to improve health status of women and children and fulfil the unmet need of the maternal child health care throughout the country^[2]. 39.9% of women who had pregnancy complication, delivery complication was 27.6% and post-delivery complication was 12.3%^[3]. Early identification of risk factors is important to develop comprehensive intervention, strategies in preventing maternal morbidities. Most of the obstetric morbidities can be averted by preventive care, early detection of risk, appropriate & timely management of obstetric morbidities or their complications, referral services, skilled care at birth and postnatal care. Hence the present study was undertaken to enumerate the risk factors associated with maternal morbidity.

Methods and Methodology

The study was conducted at a Municipal Corporation Referral Hospital, Banashankari run by Bruhat Bangalore Mahanagara Palike (BBMP) attached to medical college. A longitudinal study was done for a period of one year from Jan 2017-Jan 2018. Based on published article in Indian Journal of Public Health: Morbidity of Pre-eclampsia/eclampsia was 17.8%.⁴with d=5% and sample size was found to be 225 @250. The study was initiated after getting the clearance from Institutional Ethical Committee and permission from Chief Health Officer, BBMP. All the pregnant women belonging to 2nd and 3rd

trimester, visiting the study place for ante natal check-ups and gave consent to participate in the study were enrolled after fulfilling the inclusion criteria. All the study subjects were interviewed using a pre-tested; semi structured proforma, which had details on socio-demographic variables, obstetric history, history of risk factors, obstetric morbidity, details of emergency referral were recorded. The following details were taken during the study period. At the first visit, information regarding socio demographic profile, past and present obstetric history, risk factors (if any) were recorded in detail. Subsequently, all the pregnant women were followed up till postnatal period, when they came to the hospital check-up or by telephonic conversations. The details of morbidities (if any) during the obstetric period were recorded. The data was entered in Microsoft excel and was analysed using descriptive statistics viz. mean, percentages and standard deviation and also inferential statistical tests were applied using SPSS V-20 software.

Results

A total of 250 pregnant women were included in the study during the study period; among them 241 (96.4%) were followed up till their post-natal period (i.e., up to six weeks after delivery).

Table 1: Sociodemographic Profile of the study subjects (n=250)

Variables	Category	Frequency (Percentage)
Age	≤ 20	63(25.2)
	21-25	116(46.4)
	26-30	62(24.8)
Religion	Hindu	166 (66.4)
	Muslim	83 (33.2)
	Christian	01 (0.4)
Education Status	Illiterate	18 (07.2)
	Literate	232(92.8)
Area of residence	Urban Slum	141 (56.4)
	Urban Non-Slum	109 (43.6)
Type of Family	Nuclear	119 (47.6%)
	Joint	91 (36.4%)
	Three generation	40(16.0%)

The present study showed that, majority (46.4%) were in the age group of 21-25 years; the respondents mean age ± SD was 23.7±3.7 years. Majority of the study subjects were Hindu by religion i.e., 166 (66.4%), 232(92.8%) were literate by education among them majority were studied up to high school. 47.6% were from nuclear family, majority 56.4% were residing in urban slum area. [Table 1]

Table 2: Antenatal care details among subjects (n=250)

Antenatal care	Number
Pregnancy registration	
≤ 12 weeks	169 (67.6)
>12 weeks	81 (32.4)
Injection T. T	
2 doses	209 (83.6)
Booster dose	41 (16.4)
Ante natal visits	
<4	05 (2.0)
>4	245 (98.0)
IFA tablets	
<100	40(16.0)
≥100	210(84.0)

Among 250 study subjects, majority 169 (67.6%) of them had registered their pregnancy within 12 weeks of gestational age. All the pregnant women had received tetanus toxoid injection according to as per the history of previous delivery, majority 209 (83.6%) had received 2 doses of tetanus toxoid. Majority 245 (98.0%) had received more than 4 ante natal visit. 84% had taken more than and equal to 100 IFA tablets [Table 2].

Table 3:Risk factors among study subjects

Characteristics	Variables	Numbers (Percentage)
Gravid (n=250)	Primigravida	108 (43.2)
	Multigravida	142 (56.8)
Previous type of delivery	Normal	75(57.6)

(n=130)	Caesarean section	55 (42.4)
Infertility treatment (n=250)	Yes	19 (7.6)
	No	231 (92.4)

108 (43.2%) were of primi-gravida and 56.8% of study subjects were multi-gravida. Among the multi-gravida mothers, 130 of them had previous viable delivery. Among 130 mothers, majority 75(57.6%) had normal vaginal delivery. Only 7.6% received fertility treatment. Among 19 subjects 14 (73.7%) had primary infertility and 05 (26.3%) had secondary infertility for which treatment was taken. [Table 3] Among 19 study subject’s majority 14(73.7%) had received both clomiphene citrate and injection progesterone as a treatment and 05(26.3%) received only tablet clomiphene citrate as a treatment.

Table 4: Pregnancy induced hypertension and Gestational diabetes among studysubjects (n=142)

Past history	Present	Absent
PIH	09 (6.3)	133 (93.7)
GDM	03 (2.2)	139 (97.8)

Figures in parenthesis indicates percentages

Among the 142 multigravida, 09 (6.3%) had previous history of pregnancy induced hypertension (PIH) [Table 4]

Table 5: Family history of Hypertension, Diabetes mellitus and twin (n=250)

Family history	Present	Absent
Hypertension	59(23.6)	191(76.4)
Diabetes mellitus	47(18.8)	203(81.2)
Twins	21(8.4)	229(91.6)

Figures in parenthesis indicates percentages

In the present study, 59 of the pregnant women had family history of hypertension; among whom 26 (44.1%) had hypertension for their mother; 19 (32.3%) for their father and in 07 (11.8%) pregnant women both parents had hypertension. Similarly, 07(11.8%) of their grandparents had hypertension. Similarly in the study, 47 of the pregnant women had family history of diabetes mellitus among them 17(36.1%) had diabetes mellitus for their mother, 12(25.6%) for their father and 07(14.9%) pregnant women both parents had diabetes mellitus. 11(23.4%) of their grandparents had diabetes mellitus. In the present study, 21(8.4%) of the pregnant women had family history of twin pregnancy. [Table 5]

- In the present study, 56 pregnant women had previous abortions. Among them, 40 (86.9%) had spontaneous abortions at home and 16(28.6%) had either spontaneous/induced abortions in hospital. Among 56 pregnant women who had previous abortions, 54(96.4%) had one/two times of abortions and 02(3.6%) had abortions for more than three times.
- Among 250 pregnant women, majority i.e., 203(81.2%) had one/more morbidities during the antenatal period. Most common morbidity found was anaemia.
- All the pregnant women were followed up from 2nd trimester onwards, but 9 of them lost to follow up. Therefore, the details of the 241 study subjects available for further postnatal follow up.
- Out of 241 study subjects, majority (13.6%) had pre mature rupture of membranes, 9.5% had mal presentation, 2.0% had PIH and 0.8% had postpartum haemorrhage during intra natal period.
- Among 241 study subjects; 139 of them had more than one post-natal morbidity. Among them, 28(11.6%) had urinary tract infection, 26 (10.7%) had anaemia, 23(9.5%) had episiotomy wound infections, 15 (6.2%) had C section wound infections and one mother had postpartum hypertension.

Table 6: Association between risk factors and maternal morbidity using multivariate binary logistic regression (n=241)

Variables	Response category	B	S.E.	Wald	DF	P-value	Odds Ratio	95% C.I. for Odds Ratio	
								Lower	Upper
Education	Above primary						1		
	Below primary	2.905	1.526	3.626	1	.057	18.269	.919	363.320
Area of Residence	Non slum						1		
	Slum	.589	.940	.392	1	.531	1.801	.285	11.367
Consanguinity	Non consanguinity						1		
	Consanguinity	-.612	1.640	.139	1	.709	.542	.022	13.491
Previous type of delivery	Normal delivery						1		
	Caesarean delivery	-.339	.911	.138	1	.710	.713	.120	4.246
Family history of	HTN Absent						1		

HTN	HTN Present	.513	1.271	.163	1	.687	1.670	.138	20.165
Consumption of IFA tablets	>100 tablets						1		
	≤ 100 tablets	-1.331	.974	1.867	1	.172	.264	.039	1.783
Past PIH	PIH Absent						1		
	PIH Present	18.556	40842.422	.000	1	1.000	114508287.173	0.000	
Past GDM	GDM Absent						1		
	GDM Present	-	40192.970	.000	1	1.000	.000	0.000	
Present PIH	PIH Absent						1		
	PIH Present	-	25748.422	.000	1	.999	.000	0.000	
Present GDM	GDM Absent						1		
	GDM Present	19.763	9629.718	.000	1	.998	382939570.517	0.000	
Family history of DM	DM Absent						1		
	DM Present	-	13953.157	.000	1	.998	.000	0.000	
	Constant	.158	.990	.025	1	.874	1.171		

The logistic regression was applied and the odds ratio for below primary was found to be 18.269 with 95% CI (0.919, 363.320) and however it was not significant. consanguinity OR was 0.542 with 95% CI (0.22, 13.491), previous type of delivery OR was 0.713 with 95% CI (0.120, 4.246), family history of hypertension OR was 1.670 with 95% CI (0.138, 20.165), whereas past history PIH and present history GDM has abnormal very high odds ratio and independent variables such as past GDM, present PIH, family history of diabetes mellitus was not significant. Perhaps reason for not significant is because of small sample size in each category [Table 6].

Discussion

In the present study showed that, out of 250 study subjects, majority (46.4%) were in the age group of 21-25 years; followed by 25.2% less than/ equal to 20 years and the mean age ± SD was 23.7±3.7 years. A study done by pragti chhabra *et al.* showed the mean age was 26.3 ± 5 years and another community-based study also had almost similar findings that majority were in the age group 20-24 years^[5, 6]. In the present study most of them were Hindu by religion i.e., 166 (66.4%), majority (49.2%) were studied up to high school, most of them 141 (56.4%) of the study subjects were residing in Urban slum. However, study done by Quraishi SR *et al.* in urban area of Sangali reported 33.77% are educated up to primary school, 87.48% were Hindu by religion^[7]. the present study all had registered their pregnancy, 67.6% had registered within or equal to 12 weeks of gestational age. All the pregnant women had received tetanus toxoid injection according to as per the history of previous delivery, 83.6% had received 2 doses of tetanus toxoid, and 16.4% had received one single booster dose may be because of timely health worker visits to home and motivating for vaccination. Most of them 98.0% had received more than 4 ante natal visit and 84% of them had taken more than and equal to 100 IFA tablets during antenatal period. Another study done by patel *et al.* revealed that 99% women had received antenatal visits, 59.1% women had consumed more than 100 IFA tablets, and 96.9% women had received two doses of tetanus toxoid^[8]. NFHS-4 data for Karnataka showed that 69.5% mothers who had at least 4 antenatal care visits, 46% mothers had consumed iron folic acid for 100 days or more when they were pregnant, 83.1% had registered pregnancies, for which the mother received Mother and Child Protection card^[9]. In the current study majority 57.6% had previous history of normal vaginal delivery and 42.4% had previous history of cs. 86.9% had previous history of spontaneous abortions at home and 10% had past history of induced abortions. However, study done by Zafar s *et al.* in two countries showed that 5.4% & 21.1% had previous history of caesarean section in Malawi and Pakistan countries respectively. 7.0% and 20.3% had previous abortions in Malawi and Pakistan countries respectively^[10]. In the present study 14 (73.7%) had primary infertility and 05 (26.3%) had secondary infertility for which treatment was taken. Infertility act as a risk factor for various morbidity such as hypothyroidism^[11]. In the current study 6.3% had previous history of PIH and 2.2% had previous history of GDM whereas 23.6% had family history of HTN, 18.8% family history of diabetes mellitus and 8.4% had family history of twins. A community-based study done by bharti *et al.* revealed that 40.5% among hypertensive cases and 59.5% among normotensive had history of hypertension in previous pregnancy^[12] Another study done by kumar *et.al* showed family history of hypertension among cases and controls were 10 & 2 subjects respectively^[13]. Whereas a cross sectional study done showed that 35.29% and 10.17% had positive family history of DM among non GDM and GDM respectively^[14].

Conclusion

The most common risk factors identified among the study subjects were family history of hypertension, diabetes mellitus and previous caesarean section. Timely identification of the risk factors acts as a road

map for reduction in maternal mortality. A multi centric study covering different levels of hospitals providing MCH care including women from different socio-economic groups using stratified random sampling technique to get more reliable information on maternal morbidity and their risk factors for generalization.

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