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A STUDY ON VARIOUS DETERMINANTS OF MATERNAL MORBIDITY AMONGST MARRIED WOMEN IN REPRODUCTIVE AGE GROUP IN URBAN SLUMS OF JAMNAGAR, GUJARAT, INDIA

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ABSTRACT

Background: Maternal morbidities associated with antenatal, Intranatal and postnatal period are affecting the outcome of pregnancy. Amongst these morbidities, many are preventable. Various determinants which have effect on these morbidities can be utilized to improve maternal health as well as to reduce Maternal deaths. Government has many programs and policies to improve maternal health, but determinants like education of woman, socio economic status, cultural barriers, and women empowerment are regulating the health seeking behaviour of a woman. Current study was designed with an.

Objective: To study various determinants affecting maternal morbidity in married women of reproductive age group.

Materials and Methods: Cross sectional study was conducted in Jamnagar. 450 women were selected by 30 cluster sampling. Data analysis was done with Microsoft office Excel and SPSS 20.Chi square test was applied.

Results: 302(67.11%) women suffered from any type of Maternal Morbidity during their pregnancy, childbirth or puerperium, 55.56% ,20.22 % and 24.44% women had antenatal, Intranatal and postnatal morbidities respectively.

Conclusion: The study indicate that raising educational status of women, Proper Antenatal care, birth interval of >3 years, knowledge regarding danger signs of pregnancy; all of these determinants have a positive contribution in preventing Maternal Morbidity and Mortality.

Key Words: Determinants, Hyperemesis Gravidarum, Maternal Morbidity, Meconium aspiration syndrome (MAS), Puerperal sepsis, Postpartum Haemorrhage (PPH), Premature rupture of Membrane(PRM)

INTRODUCTION

Each year, more than a half million women lose their lives from complications arising before, during, or after childbirth. Almost all of these deaths occur in the developing world, and almost all of them are preventable.

Pregnancy and childbirth related complications are among the leading cause of mortality and morbidity in women of reproductive age in developing countries. It has been estimated that for one maternal death at least 15 more suffer from severe morbidities. As such, about an optimistic 5-7 million women suffer a severely impaired quality of life as a result of short term or long term disability. (1)

Obstetrics morbidity is classified as:

1. Direct morbidity i.e. temporary ii. permanent
2. Indirect morbidity

Temporary: APH, PPH, Eclampsia, obstructed labour, rupture uterus, sepsis, ectopic pregnancy, etc

Permanent: VVF, RVF, dyspareunia, Prolapse, secondary infertility, etc

Indirect: malaria, hepatitis, TB, anaemia

Maternal Mortality estimates are used to highlight the plight of pregnant women in less developed countries. However, Maternal Mortality is just the tip of the iceberg of the health

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problems of women. Many women do not die of causes related to pregnancy but suffer severe morbidities. In developing countries, pregnancy and childbirth related complications are the leading causes of disability among women aged 15-44. The world development report estimated that 18 percent of the burden of disease for these women is due to maternal causes. (2)

Identifying the determinants of Maternal Morbidity and mortality is a valid scientific endeavour in its own right, but it is particularly relevant to any undertaking to improve maternal health. By understanding the determinants of ill-health and their inter-relationships, it is possible to develop treatments, seek preventive measures, target high-risk individuals and groups, and assess the health implications of changes in the biological, physical, or social environment. On the other hand, it is also important to recognize that identifying and intervening against specific determinants of maternal ill-health is not exclusively within the sphere of bio-medical expertise, and that a multidisciplinary approach to studying and resolving health problems is imperative. (3)

Sixty-six percent of the women developed at least one complication during the index pregnancy and childbirth, the most common of which were prolonged labour, fever, bleeding, and pre-eclamptic toxaemia. Reporting of complications was found to be associated with women's education, parity, and knowledge about obstetric complications. (4)

METHODS

A Cross sectional study was conducted in Urban slums of Jamnagar Municipal Corporation Area from August 2010 to December 2011. By using Cluster sampling technique 30 clusters were selected and 15 women from each cluster were interviewed who had delivered in last 1 year. The study was carried out by undertaking house to house visits of the area of each cluster. From a random direction in each cluster, study was started by asking the family if there was any woman who had delivered in last one year (1st September 2009 to 31st August 2010- women who delivered in that duration).

Sample size is calculated by formula $n= 4pq/l^2$, Where,

n= required sample size

p=proportion or prevalence of interest

q=100-p

l=allowable error (10 – 20%)

An anticipated P value is taken as 50% as per WHO practical manual on sample size determination in health studies by Lwanga and Lemeshow. (5)

p is taken as 50%, so as q=50%. If L=10%,

Then, sample size would be…..

$$n = \frac{4 \times 50 \times 50}{5 \times 5} = 400.$$

Non-response rate/loss of sample = 10% of sample size

So, total sample size comes out to be 440 for the study. To make round figure, 450 study subjects were chosen.

A pretested semi-structured Performa was used to collect the data through oral questionnaire by visiting them at their home. Prior verbal consent was taken from study subjects. The data entry was done in Microsoft Office Excel 2007. Analysis was done by the use of Medcalc 10.4.8.0., SPSS version 20 and Microsoft office Excel 2007. Chi square test was applied to check the associations. Prior approval from ethical committee was taken.

RESULTS

The mean age of study subjects was 24.84 years. Amongst them 49% were 20-25 years old. 77.34% were Hindus while others were Muslims. 47.7% women were educated till primary. Only 5.11% were graduates. 72.45% women were from lower socio economic class according to Prasad's classification.

99% women had taken antenatal visits.59.1% women had consumed IFA tablets for more than 100 days during their last pregnancy, while 96.9% women had received two doses of TT during antenatal period.61.77% women had knowledge regarding danger signs of pregnancy.

The present study revealed that from all the women, 302(67.11%) women had suffered from any type of Maternal Morbidity during their pregnancy, childbirth or puerperium, while rest 148(32.89%) did not have any morbidity. (Fig.1) From the women, who had any kind of morbidity, 55.56% women had morbidity during their antenatal period, 20.22% women had morbidity during intranatal period and 24.44% women had morbidity during their post partum period. (Fig.2)

During the study, only few women had record regarding their blood investigation reports. From the hospital discharge cards or from case papers, only 130 women had record regarding Hb estimation. From these 130 women, more than three fourth women i.e. 107(82.30%) had Anaemia as they had Hb <11 gm% While rest 17.7% had Hb level >11 gm%.

Table 1 shows that from the women who had antenatal morbidity, majority had complaint of weakness (70.4%). Other morbidities found were Hyperemesis Gravidarum (25.2%), swelling of legs (25.2%), Hypertensive Disorder (Pregnan-

cy Induced Hypertension) (14.4%), Bleeding P/V (11.6%), Headache (8.8%), blurring of vision (8.4%), Eclampsia (1.6%) and fever with vaginal discharge (6%). (Insert table 1 here)

Table 2 shows that from the women who had intrapartum morbidity, major cause found were Prolonged labour (34.6%), Premature Rupture Of Membrane (31.86%), Oligohydroamnios (18.68%), Malpresentation (12.08%) and Foetal distress (12.08%). Very few women had complaint of MAS (5.5%), Polyhydroamnios (3.3%) and Cord Prolapse (2.2%). 2 women suffered from Primary Post Partum Haemorrhage.(Insert Table 2 here)

Table 3 shows that from the women who had post partum morbidities, common morbidities found were backache (22.72%), pain in stitches (18.18%), infection of stitches (13.63%), Mastitis (10%) and delayed milk output (9.1%). Post partum haemorrhage was found in 4 women, while only one woman had Septicaemia and one woman had Eclampsia. 13(2.89%) women had other problems like fever, diarrhoea, bleeding from tear etc.(Insert table 3 here)

Over all **medical complication** during pregnancy were 7.78% amongst the women. Out of those who had medical complications, 34.28% women had Diarrhoea ,22.85% had Fever, 8.57% had Reproductive Track Infection,5.7% women had Malaria during pregnancy and 5.7% had Tuberculosis infection and was on AKT. One woman was having HIV infection. 20% women had other complication like Asthma, Jaundice, Rubella, Stone etc.

70(15.55%) women had complaint of backache, the reason could be less birth interval or anaemia in last pregnancy, 2.44% women had pain in stitches and 11(2.44%) women had complaint of weakness. One had problem of Fistula and one had complaint of Incontinence in presence. (Insert Table 4 here)

This table shows that women, who had better knowledge regarding danger signs of pregnancy, had reported the Maternal Morbidity more than those who had no knowledge .i.e. 71.5% and 68.6% respectively. The difference is statistically highly significant.($p<0.001$) Though the difference between parity and Maternal Morbidity is statistically not significant, but Maternal Morbidity is higher amongst Multipara and Primipara 70.21% and 70% respectively. Women who had birth interval of <3 years had higher Maternal Morbidity (71.43%) than those who had birth interval of >3 years (41.74%). This difference is statistically significant ($p<0.05$). 100% morbidity was seen in women who had not taken ANC. 62.22% and 67.33% morbidity was found in women who had taken <3 ANC visits and >3 ANC visits respectively. This difference is statistically highly significant ($p<0.001$). Percentage of morbidity in labourers was 70.37%, which was higher than percentage of women who were with other occupations. There was no statistically significant difference between type of occupation and Maternal Morbidity. All the socio economical class had almost equal prevalence of Maternal Morbidity i.e. 68.41%, 63.56% and 66.67% in lower, middle and upper socio economical class respectively. Education has inverse relation with Maternal Morbidity of women. Those who were illiterate had higher morbidity than literates. The difference is also statistically significant($p<0.05$). Presence of morbidity in women according to place of delivery was almost equal i.e. 70.92% in Govt. hospital, 60.26% in private hospitals, 67.4% at home and 69.23% in quacks. There was no statistically significant difference observed.(Insert Table 5 here)

DISCUSSIONS:

As the determinants of Maternal Morbidity shows variation time to time according to changing lifestyle, change in health care delivery system and policies, its required to study different variables periodically. The current study has also revealed different variables and their effect on Maternal morbidity.

Aanalysis by Measham and Rochat, 1987 as cited in Bhatia. 1993 indicates that in developing countries for each maternal death, further 10-15 women suffer serious impairments (6) Based on some of these estimates it has been calculated that there are 8.25 million maternal morbidities every year worldwide (Walsh J.A.et al; 1989). (7) Others have calculated that there are over 100 acute morbid episodes for every maternal death, giving a global total of 62 million morbidities annually (Koblinsky M.A. et al; 1993). (8)

Globally, estimates of 15 % of all pregnancies worldwide are at risk of developing complications (UNICEF, 2009).

In a study of Vijay M. Sarode (2010) about 47 percent of the women in the study area reported that they had at least one problem during pregnancy. (9) Agarwal and Sidhharth (2010) in their study found that of the 312 mothers, 52 (16.7%) experienced delivery- related complication(s) cited earlier; 33 (63.5%) of the 52 mothers were delivered by a skilled birth attendant. (10)

These estimates, though crude and unreliable, point to the magnitude of Maternal Morbidity.

According to NFHS III (2005-2006) anaemia in pregnant women aging 15-49 years was 58.7%. (Hb <12 g/dl). 25.8% women had mild anaemia with Hb 10-11.9 g/dl, 30.6% had moderate anaemia with Hb of 7- 9.9 g/dl and 2.2% had severe anaemia with Hb <7 g/dl. (11) S. Sreelatha et al. (2002) in their study showed that 29.5% of subjects have haemoglobin less than 11. 22.4% are mild anaemic with haemoglobin levels between 10-10.99.. (12). The current study had higher

rate of anaemia than the above studies, the difference may be due the reason that only 130 women had reports available at the time of interview and prevalence is from these 130 women and not of the whole study group.

Vijay M. Sirode in his study(2010) the major antenatal problems reported were excessive fatigue (48 percent) (NFHS-2: 49.1 percent), followed by excessive vomiting (42 percent), swelling of the legs (31 percent) (NFHS-2: 35.9 percent), pain in abdomen (21 percent), white discharge (15 percent), blurred vision (10 percent) (NFHS-2: 12.1percent), vaginal bleeding (9 percent) (NFHS-2: 3.5 percent), convulsion not from fever (7 percent) (NFHS-2: 10.5 percent), night blindness (6 percent) (NFHS-2 and RCH: 6.3 percent), and anaemia (4 percent) (NFHS-2: 16.1 percent). (9)

In study of Bang RA, (2004) the most common intrapartum morbidities were prolonged labour (10.1%), prolonged rupture of membranes (5.7%), abnormal presentation (4.0%) and primary postpartum haemorrhage (3.2%) (13)

Retained placenta was reported by 10% of the women, and only a few reported Malpresentation and convulsion. The mean number of delivery-related morbid conditions per woman was 0.6. (4)

In a study of Bang RA et al. (2004), the postpartum morbidities included breast problems (18.4%), secondary postpartum haemorrhage (15.2%), puerperal genital infections (10.2%) and insomnia (7.4%). (13)

Patra S. Et al. (2008) In their study reported that Seventy-four percent reported at least one morbidity and Common problems reported were: weakness, lower abdominal pain, perineal pain, abnormal vaginal discharge, high fever, breast problems, excessive vaginal bleeding, etc. (14) In a study by Bruce FC et al. (2008), prevalence and type of morbidity varied by pregnancy outcome, overall, 50% of women had at least one complication. The most common complications were anaemia (9.3%), urinary tract infections (9.0%), mental health conditions (9.0%), hypertensive disorders (8.5%), and pelvic and perineal trauma (7.0%) (15)

In a study conducted by Patra S et al (2008) there was greater morbidity among women of lower socioeconomic status, (14) In a study of Koki Gilbert et al. (2010), they stated that due to a low socioeconomic status of woman, the risk of dying compared to their rich counterparts is high. (16) Similar findings were also observed by G. Rama Padma (2004), that the educational level of woman showed an inverse relation with Maternal Morbidity. Similar findings were observed in another study conducted in slum areas of Dhaka, Bangladesh, There were no significant differences in serious delivery-related complications between those who delivered at home and those delivered at elected facility. There was no significant difference in postpartum morbidity caused by delivery location ($p = 0.58$).The study conducted (Jean, 2008) in slum of Nairobi, women who delivered at a health facility indicated that more than 75% of women who delivered at appropriate facilities had at least one complication during delivery compared with about 66% among those who delivered at inappropriate facilities ($p < 0.01$). (17) Similar findings were also found in a study conducted by Patra S. et al. (2008) that Maternal Morbidity was higher amongst the women with birth interval <3 years. (14) In study conducted by Agustin et al. (2000), Women conceiving 6 months after a previous birth, or with an estimated birth interval of 14 months, had a 2.5 increased risk of maternal death and 70 percent increased risk of third trimester bleeding and premature rupture of membranes (compared to women with 2.5 – 3 years between births). (18) A study of Patra S. (2008) had also similar findings that there was greater morbidity among women who had parity >4. (14) In a study conducted by Agarwal and Sidhharth (2010), women who had knowledge regarding 1-2 danger signs were 0.87 times more likely to report the Maternal Morbidity while who had knowledge of >3 danger signs were 1.62 times more likely to report the morbidity. (10)

CONCLUSIONS

From various observations of the study indicate that raising educational status of women, Proper Antenatal care, birth interval of >3 years, knowledge regarding danger signs of pregnancy; all of these determinants have a positive contribution in preventing Maternal Morbidity and Mortality. So strengthening of these determinants will help decrease in Maternal morbidities. Better outcome of pregnancies ultimately will lead to decrease in Maternal Mortalities as well as fall in Neonatal and Infant Mortalities.

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Table 1: Distribution of women according to Morbidity during Antenatal period of their last pregnancy (n =250):

Type of morbidity	Frequency (%)
Weakness	176(70.4)
Hyperemesis Gravidarum	63(25.2)
Swelling of legs	63(25.2)
Hypertensive disorder(Pregnancy Induced Hypertension)	36(14.4)
Bleeding p/v	29(11.6)
Headache	22(8.8)
Blurring of vision	21(8.4)
Eclampsia	2(1.6)
Fever with vaginal discharge	15(6)

Table 2: Distribution of women according to presence of morbidity during their Intranatal period of last delivery (n=91)*:

Type of morbidity	Frequency (%)
Prolonged labour	31(34.6)
PRM	29(31.86)
Oligohydroamnios	17(18.68)
Malpresentation	11(12.08)
Foetal distress	11(12.08)
MAS	5(5.50)
Polyhydroamnios	3(3.3)
Cord prolapsed	2(2.2)
Primary Postpartum Haemorrhage	2(2.2)
Others	3(3.3)

*multiple responses

Table 3: Distribution of women according to morbidity during post natal period of their last delivery (n=110)*:

Type of morbidity	Frequency (%)
Backache	25(22.72)
Pain in stitches	20(18.18)
Infection of stitches(episiotomy/CS)	15(13.63)
Mastitis	11(10)
Weakness	10(9.1)
Delayed lactation or milk output	10(9.1)
PPH	4(3.63)
Septicaemia	1(0.9)
Eclampsia	1(0.9)
Others	13(11.82)

*multiple responses

Table 4: Distribution of women according to Present morbidity due to any complication during last delivery:*

Morbidity	Frequency (%)
Backache	70(15.55)
Pain in stitches	11(2.44)
Weakness	11(2.44)
Fistula	1(0.22)
Incontinence	1(0.22)
Others	2(0.44)

*multiple responses

Table 5: Association between various variables and presence of maternal morbidity (n=450)

Variable	Any morbidity		P value
	Yes	No	
Knowledge of danger signs			p=0.0091* X^2= 9.397 df=2
Yes	143(71.5)	57(28.5)	
No	118(68.6)	54(31.4)	
Prompted	41(52.56)	37(47.44)	
Parity			p=0.520 X^2=2.260 df=3
1	133(70)	57(30)	
2	85(62.5)	51(37.5)	
3	51(66.24)	26(33.76)	
>=4	33(70.21)	14(29.79)	
Birth Interval (years)			P=0.0363* x^2=4.385 df=1
<3	95(71.43)	38(28.57)	
>3	74(58.26)	53(41.74)	

Number of ANC taken			p<0.001* Z=14.9
No ANC	4(100)	0	
<3	28(62.22)	17(37.78)	
>3	270(67.33)	131(32.66)	
Education			p=0.0168* X^2=12.071 df =4
Illiterate	96(67.13)	47(32.87)	
Primary	154(71.62)	61(28.37)	
Secondary	36(65.45)	19(34.55)	
Higher secondary	7(50)	7(50)	
Graduate and above	9(39.13)	14(60.87)	
Occupation			p=0.394 X^2= 4.085 df = 3
Housewife	270(67.67)	129(32.33)	
Labourer	19(70.37)	8(29.63)	
Service	3(50)	3(50)	
Others (Parlour, Gruhudyog)	10(55.56)	8(44.44)	
Socio economic class			p=0.6306 X^2=0.922 df =2
Lower	223(68.41)	103(31.59)	
Middle	75(63.56)	43(36.44)	
Upper	4(66.67)	2(33.33)	
Place of delivery			p=5.024 X^2=0.1700 df =3
Govt. Hospital	161(70.92)	65(29.08)	
Private hospital	91(60.26)	60(39.74)	
Home	32(67.4)	15(32.6)	
Quack	18(69.23)	8(30.77)	

*The associations are statistically significant

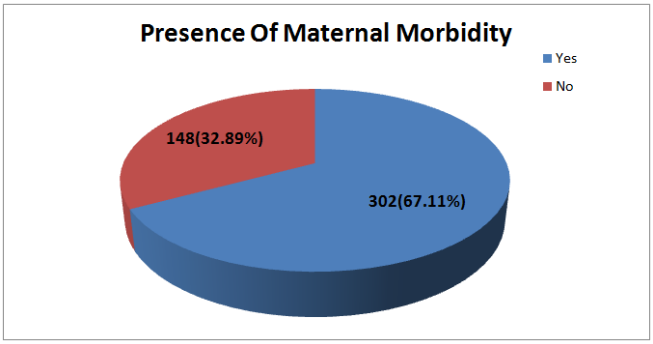

Figure 1: Distribution of women according to Presence of any Maternal Morbidity (n=450)

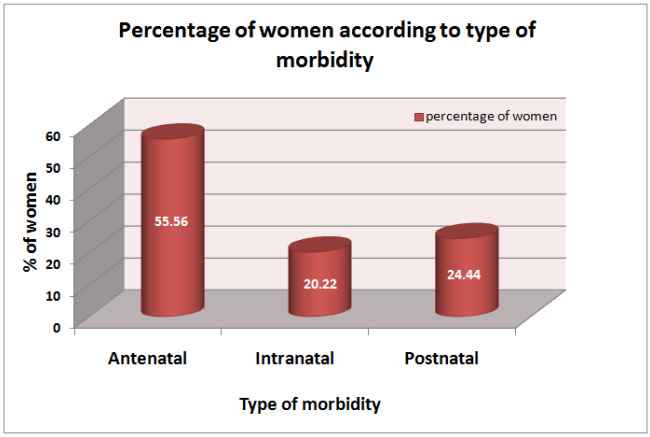

Figure 2: Distribution of women according to type of Maternal Morbidity (n=302)