

ASSOCIATION OF MATERNAL CHARACTERISTICS WITH COMPLICATIONS OF PREGNANCY: A CROSS-SECTIONAL STUDY AMONG MIDDLE SOCIOECONOMIC PREGNANT WOMEN

VINEELA NEKKANTI*, GITHA KISHORE

Department of Pharmacy Practice, Visveswarapura Institute of Pharmaceutical Sciences, Bengaluru, Karnataka, India.

Email: vineelanekenti@gmail.com

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ABSTRACT

Objective: The objective of the study was to determine the association of maternal characteristics with complications of pregnancy among middle socioeconomic women.

Methods: The enrolled subjects were divided into two groups as complicated and uncomplicated group based on the occurrence of complications in current pregnancy and their sociodemographic details along with present and past medical and medication history was collected.

Results: The mean age of the study subjects was 25.33±4.22 years. Maternal characteristics such as age, parity, body mass index, maternal education, and employment status did not have a statistically significant association with the complications of pregnancy at p<0.05. However, the first antenatal visit at the gestational age <8 weeks had a statistically significant association with the complications of pregnancy at p=0.02.

Conclusion: Early initiation of antenatal care along with adequate antenatal visits may reduce the risk of complications of pregnancy.

Keywords: Maternal characteristics, Complications of pregnancy, Anemia, Preeclampsia, Gestational diabetes mellitus, Antenatal care.

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INTRODUCTION

In 2017, Maternal Mortality Ratio of India was 122 for 100,000 live births and maternal complications were identified as the leading cause of death among women of 15–19 years of age [1]. Complications of pregnancy such as anemia, preeclampsia, and gestational diabetes mellitus (GDM) affect the health of the pregnant women adversely, resulting in poor fetomaternal outcomes [2]. Most of these complications can be prevented with adequate antenatal care (ANC) by skilled healthcare professionals [3].

Maternal economic status is a key determinant for obtaining proper antenatal care [1]. Women belonging to the upper economic class can afford timely antenatal care and women belonging to the lower economic class are supported by the government, through appropriate health schemes [4–6]. However, women belonging to the middle socioeconomic class are thriving for adequate care during pregnancy. The complications of pregnancy included in the current study were anemia, preeclampsia, and GDM, because these complications were related to high risk of bleeding with childbirth, fetal distress, and vaginal infections, respectively [1,2,7]. Hence, the current study aimed at determining the association of maternal characteristics with complications of pregnancy among middle socioeconomic women.

METHODS

A hospital-based prospective cross-sectional study was carried out in the Obstetrics and Gynecology Department of a Tertiary Care Hospital in Bengaluru for a period of 2 years. Prior approval for the conduct of study was obtained from the Institutional Ethics Committee. Written informed consent was obtained from the pregnant women willing to participate in the study. The pregnant women attended the study site from the first trimester and are willing to deliver in our study site, were included in the study.

The details of subject demographics, present, and past medical and medication history were collected in a pre-designed data collection

form. The middle socioeconomic status of the pregnant women was estimated using the Kuppuswamy scale [8], which uses education and occupation of the head of the family along with monthly income of the family. During their follow-up ANC visits, pregnant women were monitored for development of complications of pregnancy such as anemia (hemoglobin <11 g/dl), preeclampsia (new and sudden rise of blood pressure >140/90 mmHg, usually after 20 weeks of gestation along with proteinuria) and GDM (any degree of glucose intolerance with onset or first recognition during pregnancy) [9–11].

The recruited subjects were categorized into two groups as “Complicated” and “Uncomplicated” groups. “Complicated” group consisted of pregnant women, who had developed any one or combination of pregnancy complications such as anemia, GDM, and preeclampsia during their current pregnancy. The “Uncomplicated” group involved pregnant women, who did not develop any one of the above-mentioned pregnancy complications.

Sample size

All the 215 subjects, who met our study inclusion criteria and attend our study site during the study period, were involved in the study.

Statistical analysis

The statistical analysis was carried out using Microsoft excel and descriptive statistics was performed on the obtained data. Continuous variables were expressed as mean ± standard deviation. The association of maternal characteristics with pregnancy complications was determined using Chi-square analysis at 5% level of significance.

RESULTS

In the current study, details of 215 subjects were included for final analysis. The mean age of the participants being 25.33±4.22 Years. Majority 214 (99.53%) of the study subjects had singleton pregnancy. The sociodemographic profile of the study subjects is shown in Table 1. While 41 subjects reported history of medical conditions such

as hypothyroidism 21 (51.22%), poly cystic ovary syndrome 5 (12.19%), infertility 2 (4.88%), epilepsy 1 (2.43%), postpartum hypertension 1 (2.43%), diabetes mellitus 1 (2.43%), migraine 1 (2.43%), systemic lupus erythematosus 1 (2.43%), rubella 1 (2.43%), eclampsia 1 (2.43%), corrected autism spectrum disorder 1 (2.43%), and multiple medical conditions such as hypothyroidism with appendectomy 2 (4.88%), hypothyroidism with pulmonary tuberculosis 1 (2.43%),

hypothyroidism with asthma 1 (2.43%), hypothyroidism with preeclampsia and eclampsia 1 (2.43%), and preeclampsia with allergic bronchitis 1 (2.43%).

Majority of the study subjects 208 (96.74%) followed mixed dietary habits, while only 23 (24.46%) subjects reported physical activity such as walking during pregnancy. All the pregnant women were prescribed with folic acid, iron, and calcium supplements along with tetanus toxoid injection, as a part of regular antenatal care to achieve better pregnancy outcomes.

Table 1: Sociodemographic details of the study participants

Maternal characteristics	No. of subjects	
	n	%
Maternal age group		
≤20 years	116	53.95
>20 years	99	46.05
Parity		
Primigravida	98	45.58
Multigravida	117	54.41
Maternal educational qualification		
Schooling	60	27.90
Intermediate/Diploma	89	41.39
Under graduation	57	26.51
Post-graduation	9	4.18
Maternal employment status		
Yes	19	8.84
No	196	91.16
Maternal BMI at time of recruitment		
Under weight	8	3.72
Normal weight	106	49.30
Overweight	59	27.44
Obese	42	19.53
Maternal diet		
Mixed	208	96.74
Vegetarian	7	3.25

BMI: Body mass index

DISCUSSION

In India, the maternal deaths due to complications related to childbirth were reduced by 55% in 2017, as compared to 2000 statistics [1]. This improvement could be attributed to appropriate antenatal care during pregnancy. In the current study, maternal deaths due to complications of pregnancy were not identified. However, the prevalence of maternal complications was found to be 55.81%. Among the complications of pregnancy, anemia (65%) was identified as the most common complication of pregnancy (Fig. 1).

In the current study, most complications of pregnancy such as anemia, preeclampsia, and GDM (102, 85%) were identified among women of age >20 years of age. Similar findings were observed in Bhandiwad *et al.* [12] study with high prevalence of anemia (77.8%) among the 20–25 years age group. In addition, Vedavathi *et al.* [13] study (77%) and Ramesh *et al.* [14] study (55%) showed high prevalence of preeclampsia among pregnant women of 21–35 years of age. The risk of pregnancy complications increased with increased parity (64, 53.33%). This outcome of the current study contrasted with Vedavathi *et al.* [13] study, where preeclampsia was highly prevalent (65%) among primigravida. Several studies [15–17] showed that high maternal body mass index (BMI) increased the risk of complications of pregnancy, but in this study, the majority of subjects (52, 43.33%), who developed complications during pregnancy, had normal BMI. However,

Table 2: Association of maternal characteristics with complications of pregnancy

Maternal characteristics	Complicated group (n)	Uncomplicated group (n)	Chi-square value (χ^2)	p-value
Age				
≤20 years	18	17	0.326	0.57.
>20 years	102	78		
Parity				
Primigravida	56	42	0.129	0.72
Multigravida	64	53		
Maternal BMI at time of recruitment				
Normal	52	54	0.274977	p<0.05
Underweight	5	3		
Overweight	37	22		
Obese	26	16		
Maternal education				
Schooling	32	28	1.6467	0.65
PUC/Diploma	53	36		
Under graduation	29	28		
Post-graduation	6	3		
Maternal employment status				
Employed	12	7	0.4558	0.49
Unemployed	108	88		
Past medical history				
Yes	26	15	1.1867	0.27
No	94	80		
Diet				
Mixed	114	94	2.623	0.10
Veg	6	1		
First ANC visit				
<8 week	56	59	5.08	0.024*
>8 week	64	36		

*p<0.05 statistically significant

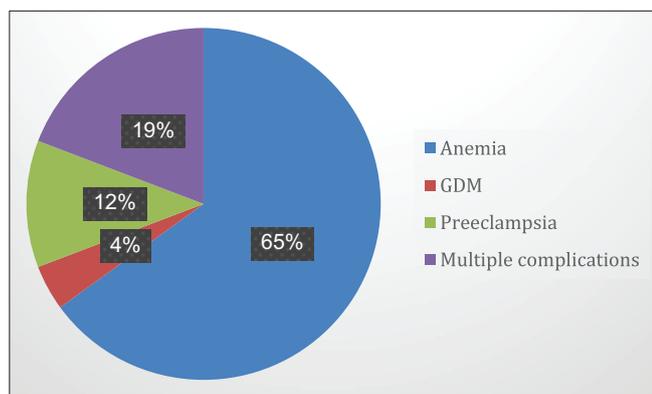


Fig. 1: Distribution of subjects among complicated group

the association of maternal age, parity, and maternal BMI with the occurrence of pregnancy complications was not statistically significant at $p < 0.05$ (Table 2).

The understanding about one's own health status improves with improved maternal educational qualification. In the current study, with the increase in maternal educational qualification, the risk of complications of pregnancy was reduced (Table 2). However, the highest rate of maternal complications (53, 44.16%) was identified among subjects with Pre-University Course/Diploma education. In addition, employed pregnant women tend to seek ANC during pregnancy, due to financial independence [18]. Only 8.84% study subjects were found to be employed (Table 1). Both maternal education and employment status did not have a statistically significant association with the complications of pregnancy at $p < 0.05$ (Table 2). On the other hand, Mahamoud *et al.* [19] study showed a statistically significant association between maternal occupation status and maternal anemia during pregnancy at $p = 0.049$.

The lifestyle of a pregnant woman has a great impact on her overall health during pregnancy. Pregnant women with poor dietary habits and sedentary lifestyle tend to have high risk of overweight and obesity, which increases the risk of complications during pregnancy [20]. However, in the current study, maternal dietary habits did not have a statistically significant association with the complications of pregnancy at $p = 0.10$.

The ANC care during pregnancy plays a vital role in achieving positive pregnancy outcomes because through antenatal visits, pregnant women will get appropriate and personalized care by skilled health care attendants, which aids in early detection and better management of pregnancy complications resulting in better pregnancy outcomes [21]. In the current study, the first ANC visit at the gestational age < 8 weeks had a statistically significant association with the complications of pregnancy at $p = 0.02$.

CONCLUSION

Regardless of the maternal characteristics, promoting early initiation of antenatal care along with adequate antenatal visits during pregnancy will help the pregnant women in attaining individualized care, thereby leading to prevention or better management of complications of pregnancy so that the maternal and fetal mortality and morbidity rates may be minimized.

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AUTHORS' CONTRIBUTIONS

Vineela Nekkanti involved in data collection, data analysis, data interpretation, and writing the manuscript, while Dr. Githa Kishore

involved in supervising entire research work, along with writing and finalizing the manuscript.

CONFLICTS OF INTEREST

No conflicts of interest to disclose.

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