IMPACT OF ANTENATAL CARE ON MATERNAL MORBIDITY IN THREE MILITARY HOSPITALS OF PUNJAB, PAKISTAN

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ABSTRACT

Objective: To determine the impact of antenatal care on maternal morbidity.
Study Design: Comparative cross-sectional study.
Place and Duration of Study: Obstetric Departments of three military hospitals in Northern Punjab cities of Rawalpindi, Jehlum and Mangla, from Jan to Mar 2019.
Methodology: Data of all mothers who gave live births in the selected military hospitals were collected. These mothers were classified as booked and unbooked on the basis of number of antenatal care visits. Maternal morbidities and complications of pregnancy were recorded. The data were analyzed using Statistical Packages for Social Science (SPSS) version 20.
Results: In our study, 254 (8.8%) of mothers were unbooked, 2273 (78.8%) were partially booked and 358 (12.4%) were booked. 894 (31%) mothers did not have any co-morbidity while 1991 (69%) mother had co-morbidity. Out of 749 (27.5%) mothers had anaemia, 869 (30.1%) had hypertension, 141 (30.1%) had diabetes mellitus, 24 (0.8%) cardiac disease, 39 (1.4%) had tuberculosis, 9 (0.3%) had liver disease 13 (0.5%) had kidney disease, 69 (2.4%) had allergies while 33 (1.1%) had other diseases. These complications were significantly greater in unbooked patients as compared to booked patients (p<0.001) Out of total 2885 mothers who gave live births in three military hospitals, only one (0.034%) mother died (who was unbooked) in Jhelum Hospital. Its Maternal Mortality Ratio (MMR) was 34.66 per 100,000 live births.
Conclusion: In our study population anemia, hypertension and diabetes were the most common comorbidities in expecting mothers. Unbooked mothers had more morbidities and complications of pregnancy than booked mothers. Furthermore, we found antenatal care to be beneficial in the prevention of these comorbidities and complications.

Keywords: Ante-natal care, Complications of pregnancy, Maternal morbidity.

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INTRODUCTION

Health care services for pregnant women are important for the survival and wellbeing of both mother and infant. According to the Pakistan Demographic Health Survey,[1] (PDHS) 2017-18, Pakistan has lagged in achieving the health-related Millennium Development Goals,[2] (MDGs), particularly Goal no 5 which is "improve maternal health". In September 2015, the Sustainable Development Goals (SDGs) were set by the United Nations. The goal number 3 was to ensure healthy lives and SDG target number 3.1 was to reduce global maternal mortality ratio to 70 per 100000 live births.[3]

Maternal morbidity is a pressing concern among Pakistani mothers.[4,5] According to the PDHS,[1] only 86% of women who gave live birth in the 5 years preceding the survey received antenatal care (ANC) from a skilled provider at least once for their last birth. About half of the consultations were by qualified doctors.[6] Eighty-five percent of women were satisfied with the services provided. In our country both socio-economic factors and health information sources are associated with women's use of ANC.[7,8]

According to UNICEF's Report (Press Release, New York, 20th February 2018), Pakistan had the world's highest number of neonatal mortality rate of 1 death in 22 live births (45.5 per 1000 live births). Since three-fourth of neonatal deaths occur in the first week of life, they are attributable to maternal causes as well, which are preventable. The main causes of maternal morbidity were anaemia, hypertension, and diabetes mellitus, and the main complications of pregnancy were gestational diabetes mellitus, fetal distress, preterm labour, haemorrhage, pre eclampsia, and eclampsia. These morbidities during pregnancy can be detected and complications during pregnancy and delivery can be prevented by quality antenatal care with appropriate number of visits appropriately distributed

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during pregnancy. This in turn can reduce maternal morbidity during pregnancy and improve outcomes of pregnancy and maternal health.[9,10]

World Health Organization (WHO) in 2002 in the Focused Approach on Antenatal Care (FANC) recommended 4 antenatal care (ANC) visits appropriately distributed throughout pregnancy. On 7th November 2016, WHO later recommended at least 8 contacts in antenatal care programs to reduce maternal morbidity and mortality and improve neonatal and maternal health. Due to limited hospital-based ANC data available from the region of Punjab, we designed this study to determine the association between antenatal care and its impact on maternal morbidity in three military hospitals.

METHODOLOGY

It was a comparative cross-sectional study. Data were collected from the obstetric departments of three hospitals in Northern Punjab cities of Rawalpindi, Jehlum and Mangla from Jan to March 2019.

Inclusion Criteria: The study population included mothers who delivered in the three military hospitals.

Exclusion Criteria: Non-consenting females were excluded.

This study was conducted after approval from the Ethical Review Board of Armed Forces Post Graduate Medical Institute (Ltr no.: 192-AAA-ERC-AFPGMI). Permission was sought from the administrators of the respective hospitals for the collection of data. Coding was used to guarantee the confidentiality of data/ information. No monetary compensation was given to the study participants.

In this study, we have considered mothers with 4 or more visits as" booked" for antenatal care. If a mother had 3 antenatal visits, she was considered as "partially booked". If a mother had less than 2 visits or no antenatal care visits, she was considered "unbooked". A self-designed structured, data collection tool was used for the collection of data against preset criteria for cases of neonatal mortality and morbidity and their mothers. It was prepared by modifying the data collection tool[11] used in a study at Health Services Academy, Islamabad with the author's permission.

Data were analyzed using Statistical Packages for Social Science (SPSS) version 20. The responses of the questionnaires were coded and scored to facilitate the entry of data. Quantitative variables were reported as Mean ± SD (Standard Deviation) while categorical variables were reported as frequencies and percentages. For inferential statistics, chi-square test was applied to find an association between qualitative variables (e.g. quality of antenatal services and maternal morbidity). The confidence interval was taken as 95%, margin of error 5% and *p*-value ≤0.05 was considered statistically significant.

RESULTS

A total of 2885 mothers, who gave live births in three hospitals were studied. Out of these, 2304 (80%) mothers were admitted in hospital in Rawalpindi (being largest), 343 (12%) were admitted in Jhelum and 238 (8%) were admitted in Mangla hospitals respectively.

On inquiry 254 (8.8%) mothers were unbooked, 2273 (78.8%) were partially booked and 358 (12.4%) were booked. The duration of pregnancy of 267 (9.3%) mothers were pre-term, 2612 (90.5%) mothers were full-term and 6 (0.2%) mothers were post-term. Out of 966 (33.50%) were primigravida, 539 (18.70%) were second gravida 1380 (47.80%) were third or more gravida (Table-I).

Table-I: Descriptive statistics of the study participants.

Parameters		Rawalpindi	Jhelum	Mangla
Total the study participants n (%)		2304 (80%)	343 (12%)	238 (8%)
Booking Status n (%)	Unbooked	205 (8.9%)	41 (12%)	4 (1.8%)
	Partially booked	2087 (90.6)	94 (27.5%)	45 (18.7%)
	Booked	12 (0.5%)	208 (60.5%)	189 (79.5%)
Age (years)		28.16 ± 4.59	28.05 ± 4.47	29.45 ± 3.53
Income Status (%)	Less than 25000	1	35	1
	More than 25000	99	65	99
Duration of Pregnancy (%)	Pre-term	10.2	6.4	4.3
	Full Term	89.7	93.0	95.7
	Post-Term	0.3	0.6	0.0
Gravidity Status n (%)	Primi	829 (36%)	103 (30%)	33 (14%)
	Second	414 (18%)	72 (21%)	52 (22%)
	Third or more	2302 (46%)	168 (49%)	153 (64%)

Out of 894 (31%) mothers did not have any co-morbidity while 1991 (69%) mothers had co-morbidity. Out of 749 (27.5%) mothers had anaemia, 869 (30.1%) had hypertension, 141 (30.1%) had diabetes mellitus, 24 (0.8%) cardiac disease, 39 (1.4%) had tuberculosis, 9 (0.3%) had liver disease 13 (0.5%) had kidney disease, 69 (2.4%) had allergies while 33 (1.1%) had other diseases (Figure-1).

About 2357 (81.7%) mothers did not have any complications of pregnancy while 528 (18.3%) had a complication during pregnancy. Out of 1.60% mothers had pre-eclamptic toxaemia, (1.5%) eclampsia, (6.20%) gestational diabetes mellitus, (0.30%) had antepartum hermorrhage, (0.20%) had postpartum hemorrhage, (0.20%) had mal presentation, (3.20%) had preterm Labour, (0.50%) had post-term labour, (4.50%) had fetal distress, (0.2%) had preterm rupture of membranes and 0.10% had Intrauterine growth restriction (IUGR) (Figure-2).

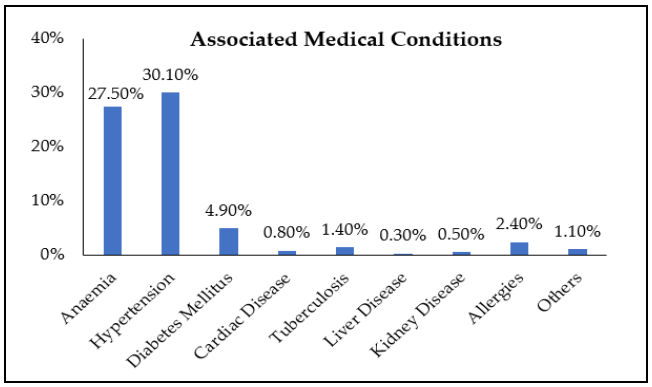

Figure-1: Associated Medical Conditions (Co-Morbidity) of mothers.

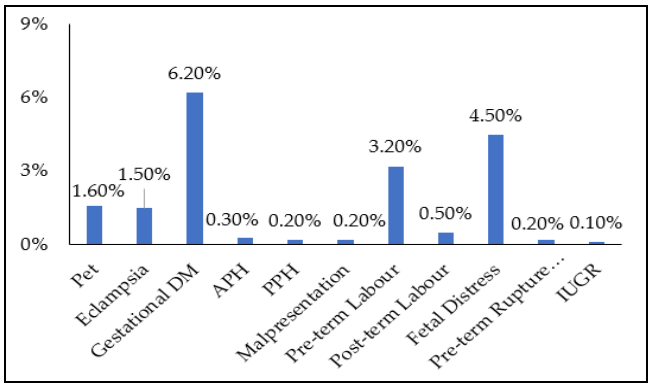

Figure-2: Complications of pregnancy.

Out of 792 mothers who had anaemia, 544 (68.6%) delivered by Spontaneous vaginal delivery (SVD), 236 (29.79%) delivered by caesarian section, 6 had forceps delivery and 6 had vacuum delivery.

Out of 864 mothers who had hypertension, 277 (32%) delivered by SVD, 16 (1.8%) had forceps delivery, 11 (1.2%) had vacuum delivery while the rest were delivered by caesarian section.

Out of 139 mothers who had diabetes mellitus, 44 (31.88%) had SVD, 1 (0.78%) had forceps delivery, 4 (2.8%) had vacuum delivery and the rest had caesarian section.

Statistically, a significant association was found between comorbidity/complications of pregnancy and booked/unbooked Status (p=0.001) (Table-II).

Out of total 2885 mothers who gave live births in three military hospitals, only one (0.034%) mother died (who was unbooked) at hospital in Jhelum. Its Maternal Mortality Ratio (MMR) was 34.66 per 100,000 live births as shown in Table-III.

Table-II: Association between comorbidity/ complications of pregnancy and booked and un-booked status of study participants.

Co-Morbidity	Un Booked	Partially Booked	Booked	*p*-value
	Frequency (%)			
Anaemia	50 (20.3)	728 (33.1)	12 (3.5)	
Hypertension	100 (40.7)	744 (33.8)	17 (4.9)	
Diabetes Mellitus	16 (6.5)	120 (5.5)	3 (0.9)	
Cardiac Disease	4 (1.6)	18 (0.8)	-	
Tuberculosis	4 (1.6)	33 (1.5)	-	0.001
Liver Disease	2 (0.8)	7 (0.3)	-	
Kidney Disease	-	13 (0.6)	-	
Allergies	9 (3.7)	60 (2.7)	-	
Others	2 (0.8)	15 (0.7)	15 (4.3)	
None	59 (24)	462 (21)	299 (86.4)	
Complications of Pregnancy				
Yes	71 (24.8)	445 (20.2)	15 (4.3)	0.001
No	185 (75.2)	1775 (79.8)	331 (95.7)	

Table-III: Maternal mortality ratio.

	Maternal Death n (%)	Maternal Mortality Rate
Hospital in Rawalpindi	-	-
Hospital in Mangla	-	-
Hospital in Jhelum	1 (0.034)%	34.66

DISCUSSION

Antenatal Health care services are essential for maternal and neonatal health and safety during pregnancy.[12] In the last two decades, Pakistan has been unable to achieve the optimum progress towards utilization of antenatal health care services.[13] Especially in rural areas, several socio-cultural factors make it diffi-

cult for women to utilize basic health services. Factors such as education of the mother, income status of the household, autonomy in decision making and reproductive health are highly significant.[14,15]

According to PDHS,[1] 2017-2018 and Gateway Health Indicators,[16] of Pakistan. The percentage of women age 15-49 with a live birth in the 5 years before the survey that had 4 or more ANC visits was 51%. In our study,[10] the percentage of women that had 4 or more ANC visits was 12.4%. However, 78.8% of women had 3 ANC visits.

In the survey,[1] 86% of women age 15-49 years with a live birth in the 5 years before the survey received ANC from a skilled provider at least once. In our study, as it was a hospital-based study, all of the women received ANC at least once except for one case.

Out of the mothers' age 15-49 in the 5 years before the survey, 31.7% of mothers were of age <20 years, 51.2% mothers were of age 20-24 years, and 17.1% of mothers were of age >24 years. In our study, the mean age of all mothers was 28.25 ± 4.51 ranging from 18-41 years.

A study from Pakistan showed a significant difference in perinatal outcomes and morbidity in ANC users and non-users. This study also showed that the ANC non-users had a much higher percentage (49%) of anemia as compared to ANC users (29%).[11] Our study was consistent with this study. Anemia in pregnant women is reported to be associated with poor outcomes.[17] Hypertension in Pregnancy is commonly reported in underdeveloped countries.[18] Out of 30.1% of females in our study also reported having hypertension. However, its incidence is less in Pakistan compared to neighboring countries like India.[19]

Most women in Pakistan deliver by spontaneous vaginal delivery (70%) followed by instrumental delivery (20%).[20] About 10-20% women deliver by caesarian section.[21] We found that mothers with anemia mostly delivered by spontaneous vaginal delivery and more mothers with hypertension and diabetes had to undergo caesarian section.

It is well known that frequent antenatal visits prevent morbidity and mortality in the mother and child.[22] We also found maternal morbidity and pregnancy-related complications to be significantly less (*p*-value ≤0.001) in booked mothers as compared to unbooked mothers. Frequency of anaemia was 20.3% in unbooked mothers whereas it was 3.5% in booked mothers. Hypertension was 40.7% in unbooked mothers whereas it was 4.9% in booked mothers. Diabetes mellitus was 6.5% in unbooked mothers whereas it was 0.9% in booked mothers. Out of 41% of unbooked mothers had comorbidities whereas 23.6% of booked mothers had comorbidities. About 24.8% of unbooked mothers had some complications of pregnancy whereas only 4.3% of booked mothers had complications of pregnancy.

In our study, out of total 2885 mothers who gave live births in three military hospitals, only one (0.034%) mother died (who was unbooked) in hospital in Jhelum. The Maternal Mortality Ratio (MMR) was 34.66 per 100,000 live births.[10]

Research is needed for determining the reason for pregnant women not attending standard antenatal care of 4 ANC visits as recommended by the World Health Organization in 2002 in the Focused Approach on ANC (FANC) and minimal eight contacts during pregnancy set by WHO in 2016,[23] in our hospitals where all services are free of cost for the entitled clientele. Research on interventions for improving the quality and components of antenatal care and their effects on maternal mortality and morbidity, and neonatal mortality and morbidity.

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CONCLUSION

Women in our study population were not utilizing Antenatal care services appropriately, as only 12% were found to be booked. Anaemia, hypertension and diabetes were the most common comorbidities in expecting mothers. Unbooked mothers had more comorbidities and complications of pregnancy as compared to those who were booked for antenatal care. There was a statistically significant association between maternal comorbidity and maternal complications of pregnancy and booked and unbooked status of mothers (*p*-value<0.001). Utilization of antenatal care services is beneficial in the prevention of maternal morbidity and complications of pregnancy, and thus improving maternal health.

Conflict of Interest: None.

Authors' Contribution

RA: Conception, study design, literature review, collection, analysis and interpretation of data, results, discussion, NA: Planning, study design, drafting, discussion, FARM: Detailed literature review, drafting, discussion, writing, AT: Literature

review, collection, analysis and interpretation of data, drafting, MW: Conception, literature review, collection of data.

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