Original Article

Fetomaternal Outcome in Patients having Non-Communicable Diseases

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Abstract

Objective: To find out the fetomaternal outcome in patients having non-communicable diseases.
Methodology: This observational study was conducted in Department of Obstetrics and Gynecology, Hayatabad Medical Complex, from January 2024 – June 2024. After informed written consent patients were selected through non-probability convenient sampling technique. Antenatal patients having period of gestation ≥28 weeks and having non-communicable diseases were included in the study. Patients were then followed for fetomaternal outcome including; mode of delivery, postpartum hemorrhage and maternal mortality, low APGAR score (<7), neonatal intensive care unit (NICU) admission, prematurity and intra uterine fetal death. SPSS vs. 23 was used to analyze the data.
Results: A total of 150 patients were included in the study. Incidence of non-communicable diseases was 7.07%. Majority of the patients were between 20- 40 years of age group with mean age 27.66 years and SD ± 5.59. Most of the patients (77.32%) were either multi or grand multigravida. Majority of the women were having period of gestation more than 37 weeks (74%). Hypertensive disorders (74.16%) were the most common non-communicable disease. Post-partum hemorrhage (11.3%) was the most common maternal complication in patients having non- communicable diseases, while low APGAR score (10%) and NICU (8.6%) admission were the most common neonatal complications.
Conclusion: Hypertensive disorders were the most common non-communicable disease during pregnancy. High cesarean section rate, prematurity and low APGAR score were the most common fetomaternal complications due to non-communicable diseases.
Keywords: Non-communicable diseases, Fetomaternal outcome, Hypertensive disorders.

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Introduction

According to WHO 'Non-communicable diseases are chronic conditions, tend to be of long duration and are result of a combination of genetic, physiological, environmental and behavioral factors'.[1] Non-communicable diseases (NCDs) are now a worldwide health concern; these are responsible for about 71% of deaths worldwide. NCDs affect both the lower and middle-income (LMIC) countries more as compared to developed countries. South Asian countries have the highest number of NCDs.[2] NCDs affect all age groups including reproductive age women. Local studies have shown a high incidence of non-communicable diseases in the under developed areas of Pakistan.[3] During pregnancy a large number of different medical conditions can present as non-communicable diseases, which can affect any organ systems of the body. Important non-communicable diseases in pregnancy include cancer, mental disorders, diabetes mellitus, hypo and hyperthyroidism, cardiovascular diseases e.g. hypertension and rheumatic heart disease, and the hematological conditions such as anemia, sickle cell disease, hemophilia. In Karachi about 18% of population was having hypertension, 8% were diabetic, and 39% of the population was pre-hypertensive and 40% prediabetic.[4] Similarly in another study conducted in the north-east of Pakistan it has been documented that a total of 6% of female were having at least one NCD, with diabetes, hypertension and asthma the most common NCDs in their study population.[5]

Maternal and child health (MCH) programs were the

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important component of Millennium Development Goals (MDGs 3, 4 and 5) especially for the developing countries. MCH program's main focus was on the factors which immediately affected the maternal, neonatal and infant mortality and morbidity, resulting in the improved survival of 'at-risk' mothers and their offspring. Unfortunately, these narrow short-term strategies failed to address the underlying root causes and social determinants of healthy life. The vulnerable individuals were at risk of developing long term consequences especially the development of non-communicable diseases in later life.[3,6]

Hypertension, undernutrition, overweight/obesity, diabetes and other complications of pregnancy causes considerable maternal and fetal morbidity and mortality. In order to improve both short and long-term MCH outcomes non-communicable diseases (NCDs) must be addressed simultaneously with immediate management of mother and child.[7]

About one in six pregnancies may be associated with diabetes; with 84% of cases having gestational diabetes (GDM) and 16% known diabetics.[7] Diabetes is associated with poor pregnancy outcomes. It can lead to macrosomia and its associated immediate complications e.g. difficult instrumental delivery, caesarian section, postpartum hemorrhage. Diabetes in pregnancy can also increase long term health risks for mother and her offspring. These women are at increased risk of developing type 2 diabetes mellitus (T2DM) and other metabolic syndromes. Similarly, offspring of mothers with hyperglycaemia are at high risk of developing obesity, diabetes, hypertension, polycystic ovarian syndrome (PCOS) and other metabolic syndromes as a consequence of adverse intrauterine developmental programming.[8,9]

Hypertensive pregnancy disorders (HPD) with or without proteinuria is a major cause of maternal morbidity and mortality. It accounts for 10% to 15% of maternal mortality in low/middle-income countries. Hypertensive disorders also lead to poor perinatal morbidity/mortality as a result of intrauterine growth retardation and preterm delivery.[10]

The concept of fetal/ prenatal programming suggests that certain events occurring during critical stages of antenatal period may have permanent effects on the fetus and the infant. The concept of fetal programming and its long term sequel are the changing paradigm. Pregnancy is a golden period of not only addressing the patients pregnancy specific complications in order to improve the short term fetomaternal outcome , but it also offers a window of opportunity to screen the patients for chronic medical disorders.[11]

Mothers having non-communicable diseases are at increased risk of cesarean section/ instrumental deliveries and its associated morbidities including anesthesia complications, genital tract injuries, and hemorrhage.[12,13] These patients need repeated hospital admissions and its financial, psychological and social impacts. Similarly, the fetus is also at risk of morbidity and mortality. These NCDs increases the risk of prematurity and its associated complications, intrauterine growth retardation, intra uterine fetal death and perinatal mortality.[14,15]

Although Non-communicable diseases have little contribution to the global health issues, but actually it represent one of the greatest threat to the global economic development and human health. NCDs can affect the future generation by causing chronic diseases in the offspring. Therefore, timely identification, evaluation, and management of these non-communicable diseases are important.[16] We have selected this topic because of its importance and lack of local data regarding non-communicable diseases during pregnancy. Although in local literature data on individual medical disorders in pregnancy is available, but data regarding holistic approach about non-communicable diseases is scarce.

Methodology

This observational study was conducted in the department of Obstetrics and Gynecology, Hayatabad Medical Complex, from January 2024 –June 2024 after approval from the Institutional Ethical Committee, approval no 1729, HMC-QAD-F-00. Patients were selected through non-probability convenient sampling technique after informed written consent.

Sample size was calculated to be 150, keeping 10.9%9 proportion of non-communicable diseases in pregnancy, with a confidence level of 95% confidence and keeping margin of error 5% under WHO sample size calculation.

Antenatal patients with period of gestation ≥28 weeks and having non-communicable diseases were included in the study, while patients less than 28 weeks pregnancy or those having communicable diseases were excluded from the study. Non communicable diseases were defined as" Chronic illnesses which were present before pregnancy and also included

pregnancy-specific conditions such as pre-eclampsia, gestational diabetes, peripartum cardiomyopathy and postpartum depression".[17]

Patients were then followed for fetomaternal outcome. Maternal outcome included, mode of delivery, postpartum hemorrhage and maternal mortality. Fetal outcome included low APGAR score (<7), prematurity, intra uterine fetal death and admission in neonatal intensive care (NICU).

Data was analyzed using IBM SPSS Statistics program V.23. Categorical data such as maternal and fetal outcome (post-partum hemorrhage, maternal mortality, low APGAR score, NICU admission, intra uterine fetal death and mode of delivery) was presented as frequencies and percentages. Numerical values such as maternal age, gestational age were presented as mean and standard deviation.

Results

A total of 150 patients were included in the study. Majority of the patients were in the age group between 20- 40 years with mean age 27.66 ± 5.5 years. Most of the patients were either multi or grand multigravida. (Table I) Majority of the women were having period of gestation more than 37 weeks with mean gestational age 37±3.1 weeks. Hypertensive disorders were the most common non-communicable disease followed by anemia and patients having multiple medical disorders. (Table II) Post-partum hemorrhage was the most common maternal complication in patients having non-communicable diseases, while low APGAR score and NICU admission was the most common neonatal complications. (Table III) Twelve patients were having multiple diseases, out of which 6 patients were having diabetes and hypertension, 5 patients having anemia with chronic hypertension, 1 patient having asthma plus diabetes.

Table I: Demographic details. (N=150)

Variables	**N(%)**
Age	
≤ 20 years	10 (6.66%)
> 20 – ≤ 30 years	92 (61.33%)
> 30 – ≤ 40 years	47 (31.33%)
> 40 years	1 (0.66%)
Gravidity	
Primigravida	34 (22.66%)
Multigravida	64 (42.66%)
Grand multigravida	52 (34.66%)
Period of Gestation	
< 37 weeks	39 (26%)
≥ 37 weeks	111 (74%)

Table II: Distribution of non-communicable diseases (N=150)

Non communicable diseases	**N(%)**
Hypertension	112(74.16%)
Diabetes	10(6.66%)
Anemia	11(7.33%)
Jaundice	2(1.33%)
Cardiac Diseases	3(2%)
Multiple diseases	12(8%)

Table III: Fetomaternal outcome details. (N=150)

Outcome Variable	**N(%)**
Postpartum hemorrhage (PPH)	17(11.33%)
NICU admission	13(8.66%)
Maternal mortality	1(0.66%)
Low APGAR score	15 (10%)
Intra uterine death	9(6%)
Prematurity	39(26%)
Mode of delivery:	
1-Normal vaginal delivery	86(57.33%)
2- Instrumental delivery	2(1.33%)
2-Cesarean section	62(41.33%)

Discussion

In our study hypertensive disorder was the most common non-communicable disease during pregnancy.

In the study conducted by Edward JO et.al, they have documented 8.05% incidence of NCDs in antenatal patients. Most of the deliveries occurred at term between 37+0weeks and 39+6weeks of gestation. Almost three quarters of the patients having non-communicable diseases were between the age range 26-40 years and 2/3 of them were either P1 or P0, with 53% being primigravida.[18] All these findings correlated with our results, except that in our study incidence of primigravida was less (22.6%). In their study, hypertension in pregnancy (preeclampsia) was the most common NCD (69.8%), sickle cell disease; peptic ulcer disease, diabetic mellitus and asthma all contribute less than 10% each to the prevalence of non-communicable diseases during pregnancy. Similarly, still birth rate (7.4%) and low APGAR score were statistically significant (p value < 0.000) in the patients having non-communicable diseases. Majority of the deliveries were by normal vaginal delivery (52.7%) while caesarean section was performed in 39.9% cases and instrumental vaginal deliveries in 8.1% cases of non-communicable diseases.[18] Our study findings are comparable with these results.

In our study hypertensive disorders were the most common NCD. In the study conducted by Firoz, T et.al The most common non-communicable disease was diabetes (74.1%) followed by hypertension (46.3%),

obesity (15%), mental health conditions (39.8%), malignancy (22.9%), epilepsy (21.1%) and asthma (23.5%).[17] The difference in the result may be because of the difference in the population as it was a scoping review with diverse study population.

Wainwright E et al in their study have reported that 88.4% of the study population had one NCD, whereas 11.7% had two or three non-communicable diseases. Hypertension was prevalent in 18.7% of admitted patients, whereas asthma and thyroid disorders affected 33.4% and 46% of the patients respectively. Preterm deliveries before 37weeks were observed in 24.6% cases. NCDs increased the risk of elective cesarean section; however emergency cesarean section was not affected by any of the NCDs. More than half of the women were delivered by cesarean section (67.5%); elective cesarean section (34.3%) were more common as compared to emergency CS (33.2%). In their study they have also written that Type 2 diabetes was having the greatest significant effect on type of labor, with over twofold increase in the odds for elective cesarean section, emergency cesarean section birth compared to vaginal deliveries. Similarly, hypertensive disorders have also increased the risk of cesarean section by over twofold. On the other hand, the risk of emergency cesarean section and induction of labor were less in patients having asthma. While thyroid disorder does not affect the mode of delivery significantly. Cesarean section rate has far exceeded than the WHO recommendations, estimated CS rates in Southern Asia to be 19%, with a reported 19.6% CS rate in 2018 for Pakistan. The results were different from our study because this study was done retrospectively in a private setup hospital.[19]

Kumari N et al has reported 1003 non-communicable diseases in 894 women, with chronic hypertension as the commonest non-communicable disease, involving 309 (30.8%) patient. Other NCDs included cardiovascular (159, 15.9%), neurological (142, 14.2%), endocrine (115, 11.5%), autoimmune (76, 7.6%), chronic kidney (48, 4.8%), chronic respiratory (43, 4.3%) diseases, psychiatric disorders (38, 3.8%), cancers (20, 2.0%), and chronic liver disease (18, 1.8%). Most of the NCDs (67.0%) were diagnosed before pregnancy. Near miss mortality occurred in 2.1% patients while maternal mortality was observed in 0.7% cases. Regarding fetal outcome 3.0% were extremely low birth weight, 6.1% were very low birth weight, and 35.3% were low birth weight. Chronic hypertension was the commonest non-communicable disease, which along with cardiovascular and neurological disorders constituted around 60% of all non-communicable diseases.[20]

In a study conducted by Syoum FH et al, it has been documented that hypertensive disorders during pregnancy were associated with poor fetomaternal outcomes. In their study 82% babies were delivered premature and 22.5% were with low APGAR score due to hypertensive diseases of pregnancy. Regarding maternal outcome 59.8% delivered vaginally, 13.9% had instrumental delivery while 2.3% ended in cesarean section.[21] The difference in the outcome was because it was a retrospectively and study population included patients more than 20 weeks gestation.[21]

There is scarcity of locally available data regarding fetomaternal outcome in women having non-communicable diseases; most of the studies were about a single medical disorder. Ahsan N et al has reported 2.06% incidence of hypertensive diseases of pregnancy in antenatal patients as it was found in 84 out of 4073 pregnant women. In 52.3% (44) of cases no fetomaternal complication was observed. Pre-eclampsia was reported in 34 (40.4%) and eclampsia in 6 (7.1%) patients. Preterm deliveries occurred in 32.1% women. Neonatal death was reported in 13% babies.[22]

Chavda G et al in their study on fetomaternal out come in diabetic mothers have reported a high cesarean section rate (54.2%). Most of their patients were having age less than 30 years. Preterm delivery was observed in 14.2% cases.[23] Similarly in a study conducted by Vyas AH diabetes was associated with poor fetomaternal outcome. Diabetic mothers were more at risk of having coexisting other medical disorders and more chances of operational delivery (57.15%).[24]

Shrivastava C et al have studied the effect of anemia on fetomaternal outcome. Mean age of their study group was 26.55 ± 4.99 years; most of the patients (75.49%) were less than 30 years of age. Similarly, most of the patients were multigravida (81.37%) as compared to primigravida (18.63%). Regarding maternal outcome (4.90%) women needed intensive care unit (ICU), and maternal mortality in one patient. Most of the patients went into spontaneous labor (82.35%). Out of which (76.47%) patients underwent normal vaginal delivery. Among fetal and neonatal outcomes, prematurity was observed in 50% cases, 62.75% were low birth weight, 42.16% were diagnosed as small for gestational age, 22.55% neonates were

admitted to the neonatal NICU, and stillbirth was recorded in 5.88% cases.[25]

This study has some limitations. The data was collected from only single unit. And secondly due to the retrospective nature of the study several women had missing information and the data cannot determine cause and effect.

Conclusion

Hypertensive disorders were the most common non-communicable disease during pregnancy. High cesarean section rate, prematurity and low APGAR score were the most common fetomaternal complications due to non-communicable diseases.

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