

Prevalence of Major Medical Disorders in Pregnancy in a Tertiary Care Hospital in North India

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Abstract:

Background: *Abnormal symptoms due to medical disorders may be attributed to the pregnancy, leading to a delay in diagnosis, while physiological symptoms and signs may lead to over diagnosis of some medical disorders. Finally, the treatment of medical disorders during pregnancy may be different from their treatment in the non-pregnant state. In a pregnant woman, there are two patients—the mother and the fetus. The physician and the obstetrician have to balance the risks and benefits to both the mother and fetus when deciding on treatment.* **Objectives:** *To know prevalence of major medical disorders in pregnancy.* **Design:** *Prospective hospital based*

*study over a period of one year. **Results:** Of the 150 patients studied evaluation revealed type-II diabetes in 3 (2%) of patients, gestational diabetes in 11 (7.33%), anaemia in 64 (42%), essential hypertension in 6 (4%) of patients and pregnancy induced hypertension in 13 (8.66%) patients. **Conclusion:** Medical disorders like pregnancy induced hypertension, gestational diabetes, essential hypertension and type-ii diabetes complicate a significant number of pregnancies and early identification is required to prevent foetal and maternal mortality and morbidity.*

Key words: pregnancy, major medical disorders, care hospital, Northern India

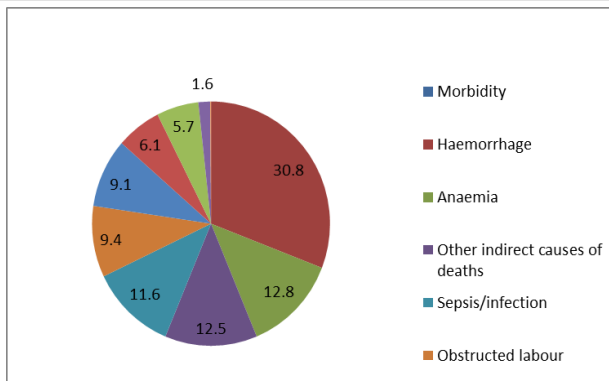
Introduction

The management of medical disorders in pregnancy has undergone significant changes in recent years. The pattern of disease has changed with improvements in socio-economic conditions, the incidence of antenatal anaemia has decreased progressively in the past few decades ^{1,2} and pulmonary tuberculosis, which used to be prevalent, is now seen only rarely. Chronic rheumatic heart disease has also become less common. On the other hand, gestational diabetes has become more common. This may be due partly to the setting up of screening services for gestational diabetes in many hospitals. According to the territory wide audit report on obstetrics and gynaecology, published by the Hong Kong College of Obstetricians and Gynaecologists, the four most common medical disorders complicating pregnancy are anaemia, diabetes mellitus, cardiac disease, and thyroid disease which occur in 6.3%, 3.0%, 0.7%, and 0.6% of pregnant women, respectively.³ In addition, because of the improvements in the medical, obstetric, and anaesthetic management of pregnancy, many women with medical disorders can go through a pregnancy without major problems.⁴

Maternal mortality is now rarely due to medical disorders and there are very few medical indications for termination of pregnancy. There has also been a progressive decrease in the perinatal mortality associated with some medical disorders such as diabetes.^{1,2} It is important for all health care professionals involved in the management of pregnant women with medical disorders to be conversant with the latest developments in order to provide the best care for these women.⁵⁻⁸

Causes of maternal death in Asia

Morbidity	Percentage
Haemorrhage	30.8
Anaemia	12.8
Other indirect causes of deaths	12.5
Sepsis/infection	11.6
Obstructed labour	9.4
Hypertensive disorders	9.1
Unclassified deaths	6.1
Abortion	5.7
Other direct causes of deaths	1.6
Embolism	0.4
Ectopic pregnancy	0.1
HIV/AIDS	0



There are four important clinical principles in the management of women with medical disorders.^{9,10} Firstly, medical disorders are affected by pregnancy, when important physiological changes occur in almost every system in the body. Haemodynamic changes may lead to an additional burden on the cardiovascular system, which may predispose to the occurrence of heart failure in women with cardiac disease or hypertension.⁶The diabetogenic effects of hormonal changes during pregnancy may lead to the development of gestational diabetes⁵ and they also make the control of pre-existing diabetes more difficult. Secondly, medical disorders may affect the pregnancy. Diabetes may lead to foetal macrosomia⁵ while chronic hypertension or renal disease can result in foetal growth retardation. Thirdly, physiological changes during pregnancy make the diagnosis of a medical disorder more difficult.

Proper counselling and preparation before a woman becomes pregnant is important in ensuring the best outcome for the pregnancy. The risk of a medical disorder and/or medical treatment to both the mother and foetus should be explained to a woman before she becomes pregnant so that an informed decision as to whether or not to get pregnant can be made. Although rare nowadays, some medical disorders are associated with a high mortality risk (over 25%).⁶

Hypertension in pregnancy is categorized according to the American College of Obstetrics and Gynecology as:

- 1) preexisting essential hypertension
- 2) preeclampsia
- 3) gestational hypertension. Or
- 4) preeclampsia superimposed upon preexisting hypertension ⁽¹⁾

These categories are important in that the various forms of hypertension that occur during pregnancy may imply different prognoses for the pregnancy itself as well as potentially for the long-term health of the mother. They may also represent different etiologies. Preeclampsia and gestational hypertension are defined as an increase in systolic blood pressure to 140 mm Hg or more, or diastolic to 90 mm Hg or more after 20 weeks of pregnancy and resolving postpartum. Preeclampsia differs from gestational hypertension due to its multisystem involvement, such as proteinuria. When a women with preexisting hypertension develops an exacerbation of her hypertension during pregnancy accompanied by proteinuria or other systemic signs, this is termed hypertension with superimposed preeclampsia.

Hypertension affects 10% of pregnancies and is a leading cause of both maternal and fetal morbidity and mortality worldwide. Hypertension in pregnancy includes a spectrum of conditions,¹² including pre-eclampsia or eclampsia, pre-eclampsia superimposed on chronic hypertension, chronic hypertension and gestational hypertension. Unlike other hypertensive disorders of pregnancy, pre-eclampsia is a multisystem disease. A distinctive feature is either sudden onset or worsening of pre-existing proteinuria.

The diagnosis of hypertension in pregnancy, and differential diagnosis of different hypertensive disorders of pregnancy, is not straightforward, despite the clearly defined criteria. Hypertension in pregnancy is defined as two recordings of a blood pressure of at least 140/90 mmHg at an interval of 6

hours. According to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure,¹³ individuals who have a systolic blood pressure of 120 - 139 mmHg and/or a diastolic blood pressure of 80-89 mmHg should be considered pre hypertensive. This recommendation suggests that the diagnostic threshold of 140/90 mmHg might be high for any population, and even more so for young females of childbearing age. This high threshold could lead to underestimation of the prevalence of hypertensive disorders of pregnancy. Furthermore, it is well recognized that blood pressure decreases in mid-pregnancy, and this fall is further exaggerated in patients who have pre-existing, chronic hypertension.¹⁴ As blood pressure tends to increase to pre pregnancy levels in the third trimester, women with pre-existing chronic hypertension could be diagnosed as hypertensive for the first time towards the end of pregnancy and diagnosed with chronic hypertension only in retrospect; that is, after their 'gestational hypertension' fails to normalize following delivery.

A possible association between pre-eclampsia and the subsequent risk of developing hypertension was reported as early as the first part of the nineteenth century.¹⁵ Early studies had several limitations, including retrospective designs, small sample sizes, inadequate durations of follow-up, difficulties establishing the diagnosis in a retrospective fashion owing to insufficient documentation, non systematic data gathering, and changes in the definition of, and diagnostic criteria for, hypertensive disorders of pregnancy over time. In addition, the specific effects of different hypertensive disorders of pregnancy were frequently ignored. A few studies that were performed between the 1950s and the early 1970s provided more evidence to indicate that hypertensive pregnancies and pre-eclampsia are associated with higher blood pressure later in life.^{16,17} Children born to pre-eclamptic mothers commonly have a low birth weight, which is associated with an increased risk of

cardiovascular mortality in adulthood.¹⁸ An inverse relationship between maternal risk of CVD mortality and infant birth weight is well recognized.^{19,20} Maternal outcomes, independent of the birth weights of offspring, have, however, attracted much less research interest, in part because of the data collected by Chesley and colleagues.^{11,21} Chesley reported that the prevalence of hypertension and rates of overall mortality and mortality owing to CVD in primiparous eclamptic women were similar to those of age-matched controls after 33 years of follow-up. The limitations of these studies included small sample sizes and suboptimal control groups (i.e. women from previously published epidemiologic studies, rather than normotensive controls).

Several more-recent studies, both prospective^{22,23} and retrospective,^{24,25} have established an association between hypertension in pregnancy, pre-eclampsia or eclampsia and hypertension later in life.

Methodology

Our study was a prospective study conducted at the largest tertiary care maternity hospital in north India. Patients were selected randomly from the Out Patient Department of Lalla Ded Hospital Srinagar (J& K). One hundred and fifty consecutive antenatal patients were selected irrespective of age, parity and duration of pregnancy. All selected patients were evaluated for complete antenatal history including past obstetric and medical history, general physical examination and complete systemic including obstetric examination. Apart from routine laboratory tests in pregnancy such as complete blood counts, blood grouping, VDRL testing, HIV serology, urine examination and Hepatitis B surface antigen. Specific investigations include blood sugar random and fasting. Oral glucose tolerance test was ordered in special group of patients such as patients with significant family history of gestational

diabetes or type 2 diabetes, previous history of macrosomic baby or patients with impaired fasting sugars. Anaemia was classified as per WHO guidelines and those patients with anaemia were subjected to complete haemogram, peripheral blood film, reticulocyte count, iron profile, B₁₂ levels, serum LDH and coomb's test.

Hypertension in pregnancy is defined as two recordings of a blood pressure of at least 140/90 mmHg at an interval of 6 hours. According to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure,¹³ individuals who have a systolic blood pressure of 120 - 139 mmHg and/or a diastolic blood pressure of 80-89 mmHg should be considered pre hypertensive. Hypertensive patients were subjected to frequent blood pressure recordings in second and third trimester, kidney function testing, liver function testing, weight monitoring and other relevant investigations wherever needed. All patients were followed upto third trimester. Results were summarised from the history, examination and investigations from the study population. Percentage prevalence of various medical disorders were calculated from the observations made from the data obtained from the patients.

Results

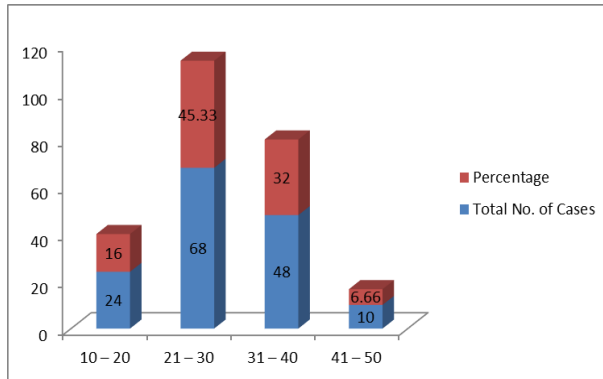
Observation and Results

Our study was a prospective study conducted over a course of one year (Dec 2010-Jan 2012) in the Department of Gynaecology and Obstetrics, Government Medical College Srinagar. One hundred and fifty consecutive antenatal patients were selected and evaluated for the study. Of the 150 patients studied, 24 (16%) of patients were in the age group of 10-20 years, 68 (45.33%) were in the age group of 21- 30 years, 48 (32%) in the age group of 31-40 years and 10 patients (6.66) percent in the age group of 41-50 years.

Table-1 Age distribution of 150 cases studied.

Age in Years	Total No. of Cases	Percentage
10 – 20	24	16
21 – 30	68	45.33
31 – 40	48	32
41 – 50	10	6.66

Graph-1 Showing age distribution of patients.

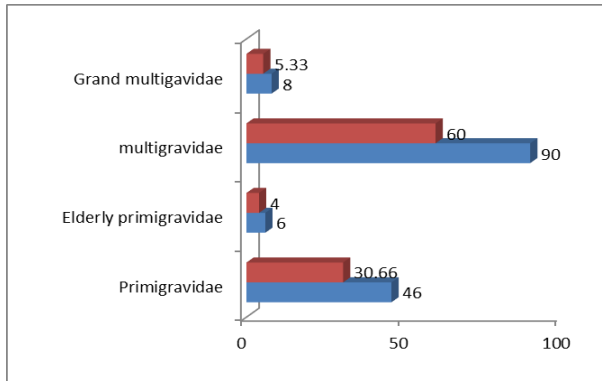


Of the 150 patients studied, 46 (30.66%) patients were primigravidae, 6 (4%) patients were elderly primi's, 90 (60%) were multi gravidae, and 8 (5.33%) patients were grand multiparas.

Table-2 Showing percentage prevalence of various group of patients.

Group of cases	no.of cases	percentage
Primigravidae	46	30.66
Elderly primigravidae	6	4
multigravidae	90	60
Grand multiparas	8	5.33

Graph 2. Showing various groups of patients in our study population



Of the 150 patients studied evaluation revealed type-II diabetes in 3 (2%) of patients, gestational diabetes in 11 (7.33%), anaemia in 64 (42%), essential hypertension in 6 (4%) of patients and pregnancy induced hypertension in 13 (8.66%) patients.

Table-3 Showing percentage prevalence of various medical disorders in our study group.

Clinical parameter	Total no. Of cases	Cases observed	Percentage
Type-II diabetes	150	3	2
Gestational Diabetes Milletus	150	11	7.33
Anaemia	150	65	42.66
Essential hypertension	150	6	4

Graph Showing percentage prevalence of various medical disorders in our study group.

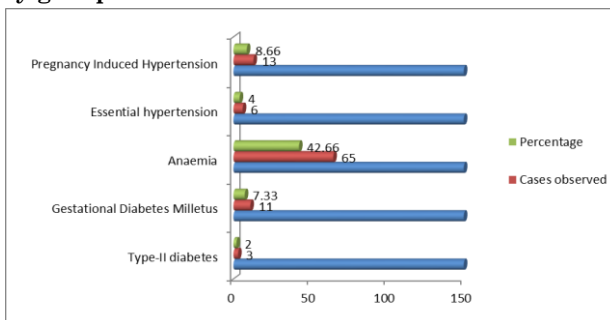
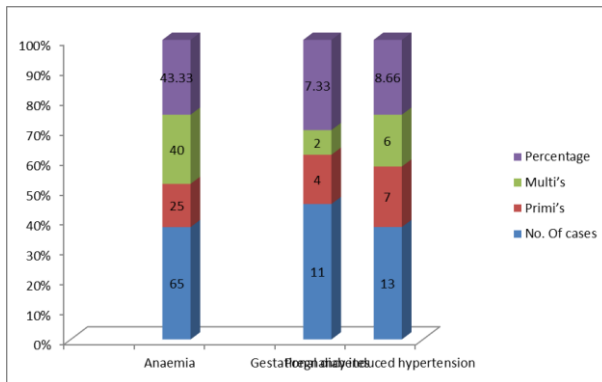


Table-4 Showing relationship of various medical disorders with parity of patients

Disorder	No. Of cases	Primi's	Multi's	Percentage
Anaemia	65	25	40	43.33
Gestational diabetes	11	4	2	7.33
Pregnancy induced hypertension	13	7	6	8.66

Graph showing relationship of various medical disorders disorders with parity of patients.



Discussion

Our study demonstrated out of 150 patients studied, evaluation revealed type-II diabetes in 3 (2%) of patients, gestational diabetes in 11 (7.33%), anaemia in 64 (42%), essential hypertension in 6 (4%) of patients and pregnancy induced hypertension in 13 (8.66%) patients. M I Harris et al studied Prevalence of diabetes, impaired fasting glucose, and impaired glucose tolerance in U.S. adults. The Third National Health and Nutrition Examination Survey (NHANES III) 1988-1994, contained a probability sample of 18,825 U.S. adults > or = 20 years of age who were interviewed to ascertain a medical history of diagnosed diabetes, a subsample of 6,587 adults for whom fasting plasma glucose values were obtained, and a subsample of 2,844 adults between 40 and 74 years of age who

received an oral glucose tolerance test. The Second National Health and Nutrition Examination Survey, 1976-1980, and Hispanic HANES used similar procedures to ascertain diabetes. Prevalence was calculated using the 1997 American Diabetes Association fasting plasma glucose criteria and the 1980-1985 World Health Organization (WHO) oral glucose tolerance test criteria. Prevalence of diagnosed diabetes in 1988-1994 was estimated to be 5.1% for U.S. adults ≥ 20 years of age. Using American Diabetes Association criteria, the prevalence of undiagnosed diabetes (fasting plasma glucose ≥ 126 mg/dl) was 2.7% and the prevalence of impaired fasting glucose (110 to < 126 mg/dl) was 6.9%. There were similar rates of diabetes for men and women, but the rates for non-Hispanic blacks and Mexican-Americans were 1.6 and 1.9 times the rate for non-Hispanic whites. Based on American Diabetes Association criteria, prevalence of diabetes (diagnosed plus undiagnosed) in the total population of people who were 40-74 years of age increased from 8.9% in the period 1976-1980 to 12.3% by 1988-1994. A similar increase was found when WHO criteria were applied (11.4 and 14.3%). The high rates of abnormal fasting and post challenge glucose found in NHANES III, together with the increasing frequency of obesity and sedentary lifestyles in the population, make it likely that diabetes will continue to be a major health problem in the U.S. X. Xiong et al studied, Prevalence, Risk factors, maternal and infant outcomes of women with gestational diabetes mellitus (GDM), retrospective cohort study was performed based on 111 563 pregnancies delivered between 1991 through 1997 in 39 hospitals in northern and central Alberta, Canada. The prevalence of GDM was 2.5%. Risk factors for GDM included age > 35 years, obesity, history of prior neonatal death, and prior cesarean section. Teenage mothers and women who drank alcohol were less likely to have GDM. Mothers with GDM were at increased risk of presenting with pre-eclampsia, premature rupture of membranes, cesarean section, and preterm delivery.

Infants born to mothers with GDM were at higher risk of being macrosomic or large-for-gestational-age.

A.R. Sarin studied prevalence of anemia in pregnancy and its impact on maternal and perinatal mortality and morbidity, and to suggest ways to make the anemia prevention programs more effective. The incidence of pregnancy anemia was determined by a population-based survey (1990–1994) of rural and urban areas using a cluster sample design. Mortality and morbidity data were gathered from our own hospital records (1982–1994). The survey data showed that 86.1% of pregnant women were anemic (Hb < 11 g/dl); 56.0% had severe anemia (Hb < 7 g/dl); and 1.9% were decompensated (Hb < 4 g/dl). The hospital-based analysis revealed that severe anemia contributed to 34.5% of all maternal deaths. Hypertensive disorders were found in 28.2% of severe anemia cases. The incidence of preterm labour was 31.2% in these cases and the birth weight 2.23 ± 1.13 kg (mean \pm SD), while perinatal mortality was 65 compared to overall rates of 7.9%, 2.78 ± 1.32 kg and 46, respectively. They conclude that severe anemia of pregnancy is still rampant and its adverse consequences remain unabated. K. Hunt et al studied trends in the prevalence of gestational diabetes mellitus (GDM). The prevalence of GDM in a population is reflective of the prevalence of type 2 diabetes within that population. In low-risk populations, such as those found in Sweden, the prevalence in population-based studies is lower than 2% even when universal testing is offered, whereas studies in high-risk populations, such as the Native American Cree, Northern Californian Hispanics, and Northern Californian Asians, reported prevalence rates ranging from 4.9% to 12.8%. Prevalence rates for GDM obtained from hospital-based studies similarly reflect the risk of type 2 diabetes in a population with a single hospital-based study in Australia reporting prevalences ranging from 3.0% in Anglo-Celtic women to 17.0% in Indian women.

Granger JP et al studied Pathophysiology of pregnancy-induced hypertension. Pregnancy-induced hypertension (PIH) is estimated to affect 7% to 10% of all pregnancies in the United States. Despite being the leading cause of maternal death and a major contributor of maternal and perinatal morbidity, the mechanisms responsible for the pathogenesis of PIH have not yet been fully elucidated. The initiating event in PIH appears to be reduced uteroplacental perfusion as a result of abnormal cytotrophoblast invasion of spiral arterioles. Placental ischemia is thought to lead to widespread activation/dysfunction of the maternal vascular endothelium that results in enhanced formation of endothelin and thromboxane, increased vascular sensitivity to angiotensin II, and decreased formation of vasodilators such as nitric oxide and prostacyclin.

Summary and Conclusion

- Medical disorders are common in pregnant patients in north india.
- Anaemia complicates 42% of pregnancies in our part of world.
- Type-ii diabetes and gestational diabetes complicate 2% and 7.33% of pregnancies.
- Essential hypertension and pregnancy induced hypertension is seen in 4% and 8.66 % of patients.

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