PREGNANCY WITH MEDICAL DISORDERS: A PROSPECTIVE CLINICAL STUDY AT A TERTIARY CARE HOSPITAL

By

Dr. MONIKA. KANNI

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Dr.ARUNA.BIRADAR

PROFESSOR

DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY

BLDE (Deemed to be University)

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INTRODUCTION

Pregnancy is a physiological situation in which practically every organ and system, including the genital tract, vascular, metabolic, respiratory, cardiac, haematological, and cutaneous tissue, undergoes numerous alterations in order to make room for the foetus. A physiological stress test called pregnancy might uncover hidden chronic conditions such diabetes mellitus, high blood pressure, chronic renal failure, heart disease, and hypercoagulability[1]. Prior to pregnancy, some of these chronic illnesses are undetected or asymptomatic.

Modern medicine and its several branches, such as obstetrics, neonatology, and medicine, have improved the prognosis for both mother and foetus with medical conditions3. Most women tolerate pregnancy's physiological changes well, and they are reversible. Physiological changes may make medical disease diagnosis difficult and cause changes in medical disease treatment while pregnant. Medical issues can affect the physiologic adaptation of pregnancy, resulting in a poor pregnancy outcome, and vice versa[2].

In this modern era, the incidence of pregnant women with acquired medical disorders has increased due to advanced maternal age and changing lifestyle.

Hence, this study is taken upon to see the incidence of medical disorders in pregnant women and the impact of disease on pregnancy and visa versa.

More than 40% of the more than 200 million pregnancies in the world each year are accidental. Unwanted does not imply unintended. Each couple should be able to prepare for parenthood and decide when they are ready. Early prenatal care is critical in preventing poor perinatal outcomes and consequences in the 40% of unintended pregnancies. During routine check-ups, sports exams, well-woman exams, emergencies, and acute visits, there are opportunities to diagnose pregnancy and prevent unwanted and unplanned pregnancies. Taking advantage of these pregnancy test opportunities can help women get into initial prenatal

care . To prevent neural tube defects, all women of reproductive age should take 400 mcg to 800 mcg of folate daily. The United States Preventive Task Force (USPTF) and The American College of Obstetrics and Gynecology (ACOG) recommend it because most women present after the critical period of organogenesis.[1] Preventing, identifying, and addressing preconception health issues, pregnancy readiness, early prenatal care, and minimising risks during the perinatal and interconception period are the key determinants of a healthy pregnancy and reproductive life.[2,3]

Organic and hormonal changes alter women's physical and mental health during pregnancy. These differences may also affect women's perceptions of their quality of life [2]. Pregnancy causes distinct physiological responses. It causes stress in women's bodies, leading to metabolic, hormonal, cardiovascular, respiratory, and musculoskeletal adaptations [3]. During pregnancy, the anatomical, physiological, and biochemical accommodations are significant, beginning shortly after fertilisation and continuing throughout the pregnancy. [4] During pregnancy, the majority of women experience nausea and vomiting, heartburn, backache, round ligament pain, frequent urination, varicose veins, constipation, leg cramps, and haemorrhoids, which can lead to decreased comfort and well-being . In contrast to general physical changes, health beliefs, values, and expectations of families during pregnancy are culturally specific. During pregnancy, the mother's psychological response shifts from uncertainty and hesitation to vulnerability and preparation for the baby's birth. The changes in the mother's body during pregnancy may create a negative image of the body in her mind, influencing her sexual response. These changes may be concerning to some couples who do not communicate their feelings to one another.[5] Although prenatal care is intended to improve maternal and neonatal outcomes, it should be noted that changes in this period can have an impact on a woman's life during pregnancy.[6] Predelivery and postdelivery (postpartum) care in women in developed countries include more comprehensive purposes in addition to prevention, diagnosis, and

management of pregnancy complications and problems. It encourages women's psychological adaptation to pregnancy, implying that the quality of life and psychological status of pregnant women are the focal points.[7] Although the importance of the pregnancy period has been recognised in recent years, conducting research on the fields that affect women's quality of life during pregnancy can be useful in developing appropriate maternal health strategies. There is little information available about the changes experienced by pregnant women in physical, psychological, and social areas, indicating that pregnant women's quality of life and changeable areas require more attention.[8] Because access to qualitative information on cultural areas is critical for effective therapeutic interventions[9], and because there are few qualitative studies in this field, this study was conducted to identify the factors influencing pregnancy quality of life..

Various medical diseases affect a significant proportion of pregnancies worldwide. In the past, the majority of them were contraindications to pregnancy. Most women tolerate the medical condition well, and it is reversible.[2] Medical issues may also interfere with pregnancy's physiologic adaptations, resulting in a poor pregnancy outcome, and vice versa. The treatment of medical disorders in pregnancy is based on four key clinical principles.:

- Medical disorders affected by pregnancy
- Medical disorders that affect pregnancy
- Physiological changes may make diagnose of medical disease difficult
- Treatment of medical conditions may be totally different in pregnant state and non-pregnant state

In developed countries, the maternal mortality ratio is 8 per 100,000 live births; in developing countries, it is 450 for the same number of live births. [3] The goal of this study is to learn about the various medical disorders that can occur during pregnancy and their impact on maternal

health and foetal well-being, as well as pregnancy-related medical disorders and their consequences.

Furthermore, research indicates that stillbirth in general and intrapartum stillbirth in particular are primarily caused by attributable underlying causes such as maternal medical and obstetric conditions, access to quality obstetric care services during pregnancy, and the types, timing , and quality of intrapartum care. Ethiopia is still one of the ten high-burden countries, with a birth rate of more than 25 per 1000.[4] The Ethiopian Demographic and Health Survey (2011) reported 46 perinatal deaths per 1000 total births per year, while Addis Abeba experienced around 30 per 1000 births during the same period.[7] The medical conditions of the mother during each pregnancy can influence pregnancy outcomes. Marshall and Raynor (2014:224) identify hypertensive , metabolic, endocrine, respiratory, haematological disorders, infections, and nutritional deficiencies that can emerge or worsen during pregnancy as critical factors that can lead to adverse pregnancy outcomes, including stillbirth.[8] For instance, of the 20,000 pregnancies that resulted in stillbirth (39% intrapartum stillbirth) in South Africa between 2008-2009, 20% were associated with hypertensive disease that could have been managed to avert the adverse outcomes.[9] Similarly , it is widely assumed that HIV and syphilis infections have statistically significant associations with stillbirth. For example, a Namibian study found that approximately 26% of stillbirths in the study population had a history of HIV infection during their index pregnancies.[10] According to a study from North-Eastern Ethiopia, pregnant women with syphilis were three times more likely to have a stillbirth. Many of these risk factors could be screened for and managed as part of standard[11] antenatal care, making it an essential public health practise. As a result, this study collected data from a public health facility in Addis Abeba on key maternal medical conditions such as hypertension, diabetes, infections, Antenatal Care (ANC) attendance, and foetal condition during the pregnancy to see if any of

these had statistically significant associations with intrapartum stillbirth compared to livebirth outcomes.

In recent years, there have been significant changes in the management of medical disorders in pregnancy. Disease patterns have shifted as socioeconomic conditions have improved. For example , the prevalence of antenatal anaemia has steadily declined over the last few decades.[1,2] and pulmonary tuberculosis, which was once common, is now only seen infrequently. Chronic rheumatic heart disease has also declined in prevalence. Gestational diabetes, on the other hand, has become more common. This could be attributed in part to the establishment of screening services for gestational diabetes in many hospitals. According to the Hong Kong College of Obstetricians and Gynecologists' territory-wide audit report on obstetrics and gynaecology, the four most common medical disorders complicating pregnancy are anaemia, diabetes mellitus, cardiac disease, and uterine fibroids. Furthermore, because of advancements in pregnancy medical, obstetric, and anaesthetic management, many women with medical disorders can have a healthy pregnancy. Maternal mortality in Hong Kong has decreased from 45 per 100,000 total births in 1961 to 4 in 1990. 4 An amniotic fluid embolism is the most common cause of maternal death.[3] Maternal mortality is now uncommon due to medical problems, and there are very few medical reasons to terminate a pregnancy. Perinatal mortality associated with some medical disorders, such as diabetes , has also been steadily decreasing.[1,2] It is critical that all health care professionals involved in the care of pregnant women with medical disorders to be aware of the latest developments in order to provide the best care for these women. The four articles in this issue are certainly helpful in this respect.[5-8]

Four clinical principles are critical in the treatment of women with medical disorders. To begin, pregnancy has an impact on medical disorders because significant physiological changes occur in nearly every system in the body. Changes in hemodynamics may put

additional strain on the cardiovascular system, predisposing women with cardiac disease or hypertension to heart failure. The diabetogenic effects of pregnancy hormonal changes may result in gestational diabetes [5], as well as making pre-existing diabetes control more difficult. Second, medical issues may affect the pregnancy. Diabetes can result in foetal macrosomia [5], while chronic hypertension or kidney disease can result in foetal growth retardation. Third, physiological changes during pregnancy make diagnosing a medical disorder more difficult. Medical disorders can cause abnormal symptoms that are mistakenly attributed to pregnancy, resulting in a delay in diagnosis, whereas physiological symptoms and signs can lead to overdiagnosis of some medical disorders. Finally, medical disorders treated during pregnancy may differ from those treated in non-pregnant women. A pregnant woman has two patients: the mother and the foetus. The doctor and obstetrician must weigh the risks and benefits to both the mother and the foetus when deciding on treatment.

Proper counselling and preparation before a woman becomes pregnant is critical to ensuring the best possible pregnancy outcome. Before becoming pregnant, a woman should be informed about the risks of a medical disorder and/or medical treatment to both the mother and foetus so that she can make an informed decision about whether or not to become pregnant. Although uncommon nowadays, some medical conditions are associated with a high mortality risk (more than 25%).[6] These women should be discouraged from becoming pregnant. However, it should be stressed that the final decision should be made by the woman herself after proper counselling. They should also be given proper contraception or sterilisation advice if they decide not to become pregnant. This reduces the likelihood of an unplanned pregnancy necessitating abortion. Some contraceptive methods may not be completely appropriate for women with certain medical disorders , and the efficacy and potential side effects, as well as the woman's medical condition, should be carefully considered before the most appropriate method is chosen. This may necessitate a high level of skill and experience.

When a woman decides to become pregnant, she should be properly prepared. Medication with potential foetal harm should be switched, if possible, to another medication known to be safe during pregnancy. Because a woman is usually pregnant for more than two weeks before the pregnancy can be diagnosed , it is preferable to change the drug (especially if it is teratogenic) before the woman becomes pregnant. Before attempting pregnancy, the medical condition should be well controlled. This has the potential to improve the foetal outcome. There is some evidence that good diabetes control reduces the risk of foetal anomalies in women who already have diabetes.[11] Proper planning is also necessary to improve the maternal outcome. Elective cardiac surgery, for example, may be required prior to pregnancy to improve the woman's condition. Again, appropriate contraception advice is required while the woman waits for the medical condition to be controlled. Because pre-pregnancy counselling necessitates the expertise of both the obstetrician and the physician, clinics that include both parties are ideal for counselling and treating these women.

After the woman has conceived, the obstetricians and physicians must continue to work together. Other health care professionals may also be required to participate. Anaesthesiologists should be consulted early to determine the best method of pain control and to plan for anaesthesia for a caesarean section, whether it is an elective procedure or an emergency during labour. It is encouraging that anaesthesiologists in some hospitals (for example, Tsan Yuk Hospital) have begun to run assessment clinics for antenatal patients so that the patients can be prepared for labour and delivery management.

The need for contraception should be reconsidered after childbirth, and the best method should be recommended. It goes without saying that the best management of a woman's medical disorder necessitates a multidisciplinary approach with open communication among all staff members. A combined clinic with both physicians and obstetricians is ideal for treating more common medical conditions such as idiabetes or heart disease . A case conference with all of

the healthcare professionals who are treating the patient may be necessary at times. Collaboration is the only way for the specialties involved to ensure the best possible outcome for pregnant women with medical disorders.

BACKGROUND

1)PREGNANCY AND CARDIAC DISORDER

Cardiac disease complicates 0.2–4% of all pregnancies in Western countries.[1] In developing countries like India, cardiac diseases complicate 2% of pregnancies and contribute to about one-fifth of all maternal deaths. Rheumatic valvular heart disease is most common cause in developing countries, comprising 56–89% of all cardiovascular diseases in pregnancy.[13]

PHYSIOLOGY

Early in the first trimester, hemodynamic changes begin. Plasma volume begins to rise in the sixth week of pregnancy and rises to 50% above baseline by the end of the second trimester. To facilitate the increase in cardiac output, the heart rate increases to about 20% above baseline.

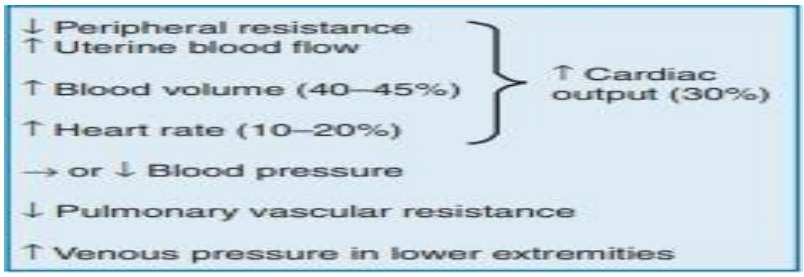


Figure 1- hemodynamic changes during pregnancy

DURING LABOR

The hemodynamic changes that occur during labour and delivery are abrupt. With each uterine contraction, up to 500 mL of blood is released into the circulation, causing a rapid increase in cardiac output and blood pressure. During the second stage of labour, cardiac output is frequently 50% above baseline. Blood loss during delivery, as well as increased venous return and auto-transfusion from the uterus, may place the mother under significant hemodynamic stress.[12,13]

CLASSIFICATION OF CARDIAC DISEASE

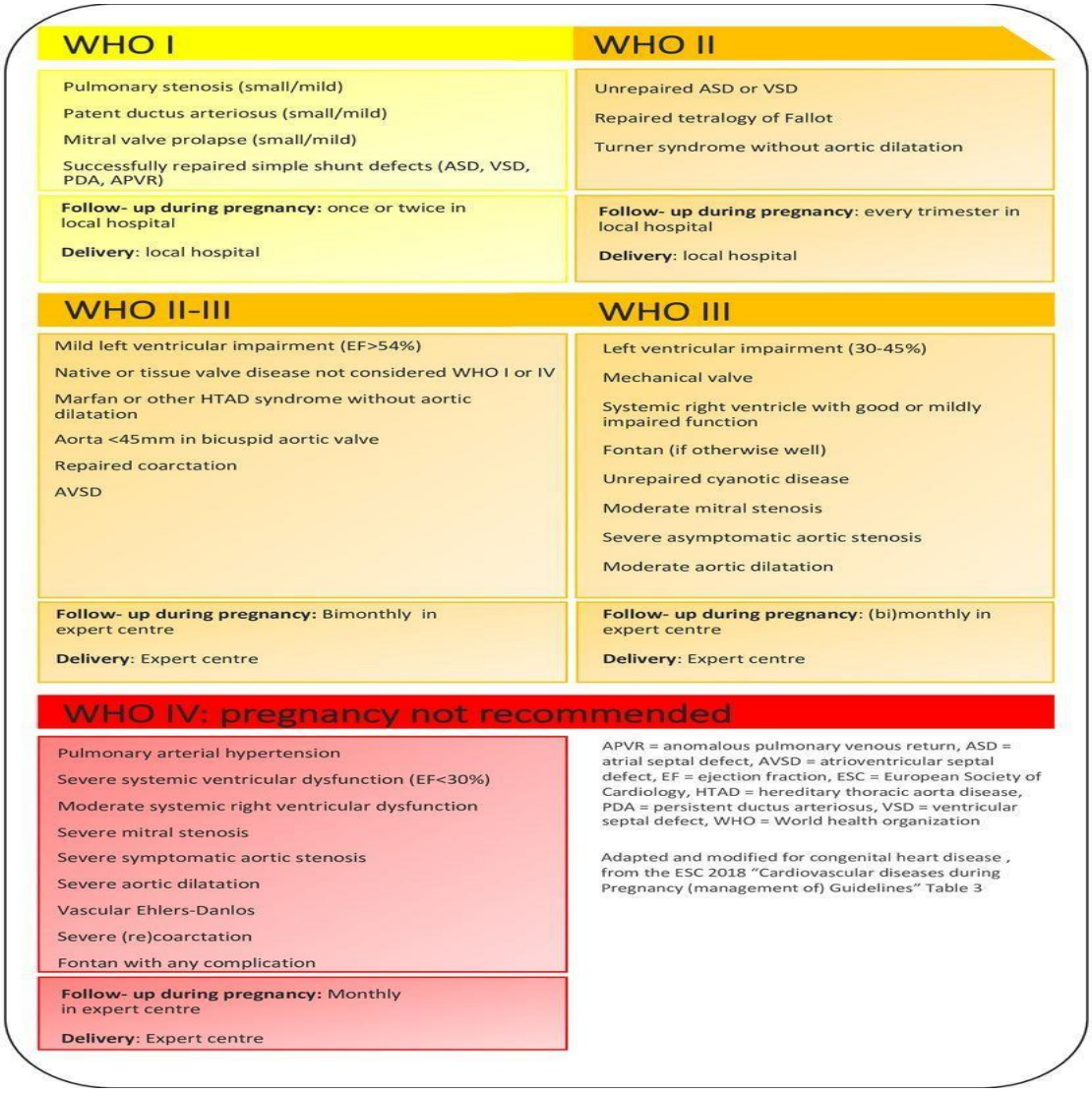
Figure 2-NYHA functional classification of cardiac disease

Grade I	Patients have no limitations of physical exercise; ordinary activity does not cause undue fatigue, palpitations, dyspnea or angina
Grade II	Patients have slight limitations of physical exercise; ordinary activity causes undue fatigue, palpitations, dyspnea or angina
Grade III	Patients have marked limitations of physical activity, less than ordinary activity causes symptoms
Grade IV	Patients have an inability to carry on physical activity without symptoms

Figure 3-Risk score from CARPREG Study

Prior cardiac event (heart failure, transient ischaemic attack, stroke before pregnancy or arrhythmia)
Baseline NYHA functional class >II or cyanosis
Left heart obstruction (mitral valve area <2 cm^2, aortic valve area<1.5 cm^2, peak LV outflow tract gradient >30 mmHg by echocardiography)
Reduced systemic ventricular systolic function (ejection fraction<40%)
CARPREG risk score: For each above-mentioned CARPREG predictor that is present, a point is assigned. Risk estimation of cardiovascular maternal complications 0 point 5% 1 point 27% >1 point 75%

Figure 4: Modified WHO Classification of Maternal Cardiovascular Risk



EFFECT OF PREGNANCY ON CARDIAC DISEASE AND VICE VERSA

Due to physiological changes, there are several times during pregnancy with a known cardiac disorder when the risk of cardiac decompensation is especially high.[13]

1) The hemodynamic changes of pregnancy begin between 12 and 16 weeks of gestation.

2) Between 28 and 32 weeks of gestation, when the hemodynamic changes of pregnancy are at their peak and the cardiac demands are at their highest.

3) Labor and delivery are the most difficult times for pregnant cardiac patients.

4) Shortly after the baby and placenta are delivered. As a result of the sudden increase in blood volume

EFFECTS OF MATERNAL CARDIAC DISEASE ON FOETUS

Preterm delivery and foetal growth restriction are the most common causes of foetal morbidity. This is most likely due to a failure to maintain adequate uteroplacental circulation. And it is dependent on the severity of the heart's functional impairment and the chronic tissue hypoxia. When a mother has congenital heart disease, the risk of having a child with congenital heart disease increases. Fetal death in pregnant cardiac patients, most of whom have cyanotic heart disease. It also occurs in patients with Marfan syndrome who have acute aortic dissection and in cardiac patients who have significant functional impairment (class III and IV, NYHA classification). A poor outcome in these cases is related to the degree of maternal polycythaemia, which results in chronic hypoxemia.

3)DIABETES AND PREGNANCY

Diabetes mellitus is a disorder of carbohydrate metabolism. It is caused by a combination of hereditary and environmental factors and is characterized by either inadequate secretion or inadequate action of insulin.

CLASSIFICATION OF DIABETES IN PREGNANCY

Noninsulin-requiring gestational diabetes mellitus (GDMNI): abnormal carbohydrate tolerance with onset or first diagnosis during pregnancy that does not require insulin. Gestational diabetes mellitus insulin requiring (GDMI): a condition characterised by abnormal carbohydrate tolerance that develops or is diagnosed during pregnancy and necessitates the use of insulin.[14]

Class A: abnormal carbohydrate tolerance in the nonpregnant state identified before the present pregnancy that does not require insulin either before or during the pregnancy.

Class B: onset of insulin-requiring diabetes after 20 years, with a duration of less than 10 years.

Class C: onset of insulin-requiring diabetes between ages 10 and 20 with a duration of less than 20 years, or duration 10–20 years regardless of age of onset.

Class D: onset of insulin-requiring diabetes prior to age 10 years, or duration greater than 20 years regardless of age of onset, or insulin-requiring diabetes with chronic hypertension, or insulin-requiring diabetes with mild retinopathy.

Type E: Overt diabetes mellitus with calcified pelvic vessels l Type F: D

Class F: insulin- requiring diabetes with diabetic nephropathy (proteinuria greater than 500 mg in a 24-hour urine collection).

Class R: insulin-requiring diabetes with proliferative retinopathy.

Class T: insulin-requiring diabetes with renal transplant.

Class H: insulin-requiring diabetes with coronary artery disease.

CARBOHYDRATE METABOLISM IN PREGNANCY

Because of the gradual increase in insulin resistance, pregnancy is a diabetogenic condition. There is an increased risk of hypoglycemia in early pregnancy due to increased insulin sensitivity, nausea, and vomiting—mid-second and third trimesters when insulin resistance begins to occur to provide nutrition to the growing foetus.

The diabetogenic effects of pregnancy are:

1) Insulin resistance:

Production of human placental lactogen, cortisol, estriol, and progesterone which all have anti-insulin action

Increased destruction of insulin by the kidney and placenta (insulinase)

2) Increased lipolysis: The mother utilizes fatty acids for her caloric needs, sparing glucose for the fetus

3) Changes in gluconeogenesis: Alanine and other amino acids, a primary gluconeogenic source in the mother, is preferentially used by the fetus.

EFFECTS OF DIABETES ON PREGNANCY

Chronic complications occur due to a long-standing hyperglycemic state. This causes endothelial damage leading to a small vessel or extensive vessel disease. These include the following

l) Microvascular angiopathy

2)Macrovascular angiopathy

Diabetic cardiomyopathy may pose a risk of death. There is also a 10% increased risk of preeclampsia, and other diabetes complications include preterm labour, chorioamnionitis, polyhydramnios, and urinary tract infections. There is an increased risk of recurrent abortion in the case of uncontrolled diabetes. Dehydration from hyperemesis or diarrhoeal disease during the antepartum period, like febrile illnesses, can precipitate ketoacidosis, which can be life-threatening for the mother and cause sudden foetal death. Growth abnormalities, macrosomia, growth restriction and malformations, and chemical imbalances after birth, including hypoglycemia, hypocalcemia, hypomagnesium, and hyperbilirubinemia, are the most serious foetal risks. Fetal oxygenation problems due to Sudden fetal demise, chronic fetal hypoxia, and respiratory distress syndrome occur, and long-term sequelae include the development of type 2 diabetes mellitus.[14,15]

4) HYPERTENSIVE DISORDERS IN PREGNANCY

Hypertension in pregnancy is defined as a systolic pressure level of 140 mmHg or higher or l Diastolic blood pressure of 90 mmHg or higher (Korotkoff V).[16,17]

- Hypertensive disorders during pregnancy can be included into four well-defined groups: l Gestational hypertension
- Preeclampsia, eclampsia
- Chronic hypertension

  Essential

  Secondary

- Preeclampsia superimposed on chronic hypertension

Chronic hypertension in pregnancy is defined as hypertension before pregnancy or before the 20th week of gestation, at least 4–6 hours apart on more than one occasion. Or Persistence of hypertension for 12 weeks postpartum is also retrospectively described as chronic hypertension. And the diagnosis of chronic hypertension is straightforward if the patient is already on antihypertensives before pregnancy.[16,17]

Chronic hypertension in pregnancy is subclassified as:

l Mild hypertension: Systolic blood pressure of 140– 159 mmHg or Diastolic blood pressure of 90–109 mmHg.

l Severe hypertension: Systolic blood pressure of 160 mmHg or greater or diastolic blood pressure of 110 mmHg or greater.

CAUSES

1. Primary or essential hypertension

2. Secondary hypertension

- Renal

  Renal parenchymal disease (glomerulonephritis, reflux nephropathy, adult polycystic disease)

  Renovascular hypertension (renal artery stenosis)

- Endocrine l Diabetes with vascular involvement

  Thyrotoxicosis

  Pheochromocytoma

  Primary aldosteronism

  Cushing syndrome

  Collagen vascular disease

  Systemic lupus erythematosus

  Scleroderma

- Others

  Aortic coarctation

  Increased intracranial pressure

PATHOPHYSIOLOGY

The most important determinants of blood pressure are cardiac output and PVR. Peripheral vascular resistance is affected by humoral factors. And Cardiac output depends on cardiac contractility and the intravascular volume status. Elevated blood pressure may result from alterations in one or several of these factors. Essential hypertension starts with increased cardiac output and normal PVR. A gradual increase follows this phase in PVR and a fall in cardiac output. Most pregnant women with essential chronic hypertension are in the early stages of hypertension and usually have elevated cardiac output and normal or mildly elevated PVR and rarely show evidence of end-organ damage. Women with chronic hypertension have a limited ability to counterbalance this increase in cardiac output by further decreasing their PVR and maintaining their blood pressure under the normal limit. Subsequently, as a consequence of this limited ability, their blood pressure starts to rise during 3rd trimester.[17,18]

EFFECT OF CHRONIC HYPERTENSION ON PREGNANCY

Chronic hypertension in pregnancy is classified as either low or high risk.

Women with mild hypertension at the first visit, regardless of antihypertensive medication treatment, are considered low risk. And without causing end-organ damage.

A low-risk pregnancy will be uncomplicated or encounter minor complications. A low-risk patient may become high-risk later in pregnancy if she develops severe hypertension or preeclampsia.

Risk factors for high risk include maternal age of more than 40 years, hypertension lasting longer than 15 years (long-standing hypertension), BP greater than 160/110 in early pregnancy (severe hypertension), diabetes, connective tissue disease, coarctation of the aorta (secondary hypertension) and concurrent cardiovascular and renal disease (end organ damage).

Maternal risks include exacerbation of hypertension, superimposed preeclampsia, congestive cardiac failure, pulmonary edema, intracerebral bleed, acute renal failure, abruption placentae with disseminated intravascular coagulation (DIC), and death.

The risk of preeclampsia in mild hypertension is upto 20%, but this increases to 50% with severe hypertension and 75% if hypertension is in the high-risk category. The incidence of abruptio placentae is 0.5–2% with mild chronic hypertension and increases to 3–10% in severe hypertension.[18]

Fetal morbidity and mortality is directly related to the severity of hypertension. Fetal risks include SGA, Premature birth.

EFFECT OF PREGNANCY ON CHRONIC HYPERTENSION

The physiological decrease in systemic vascular resistance in normal pregnancy results in a decrease in blood pressure, which has a nadir at 16–18 weeks of gestation and returns to pre-pregnant levels by the third trimester.

2)PREGNANCY AND EPILEPSY

However, epilepsy is one of the most common neurological disorders that necessitates continuous treatment during pregnancy with known teratogens.

Seizures are the most common major neurologic complication encountered during pregnancy. The primary treatment of these disorders must be learned by the practising obstetrician. The obstetrician must determine whether the medication will harm the developing foetus.

Physicians must conduct a risk/benefit analysis with the patient before proceeding with therapy.[19]

EFFECT OF PREGNANCY ON EPILEPSY

It has been taught that between 30% and 50% of patients experience an increase in seizure frequenc during pregnancy. The increase was linked to noncompliance with their medication regimen or sleep deprivation. Improvement in seizure frequency was associated with improved adherence to the drug regimen or a correction of sleep deprivation for the nine months preceding pregnancy, as stress is often associated with increased seizure frequency. Because of increased distribution and clearance volume, antiepileptic drug doses are required to be increased.

EFFECT OF EPILEPSY ON PREGNANCY

Most women with seizure disorders who become pregnant have an uneventful pregnancy with an excellent outcome.

Infants born to epileptic others had a smaller head circumference, according to research. This effect was observed in both untreated and medicated epileptic women. In neonates born to epileptic women, there is an increase in preterm labour, bleeding , pregnancy-induced hypertension, and a decrease in head circumference, primarily in women taking carbamazepine alone or in combination with phenobarbital.

In conclusion, women with seizure disorders are more likely to have FGR and stillbirth. Infants born ito mothers with seizure disorders appear to be smaller on average than their control counterparts. Even though they are smaller, they are usually within the normal gestational age range. Furthermore, preeclampsia is likely to be more common in mothers who have seizure disorders. However, the vast majority of pregnancies are uncomplicated, with no increase in complications over what is expected **.**[19]

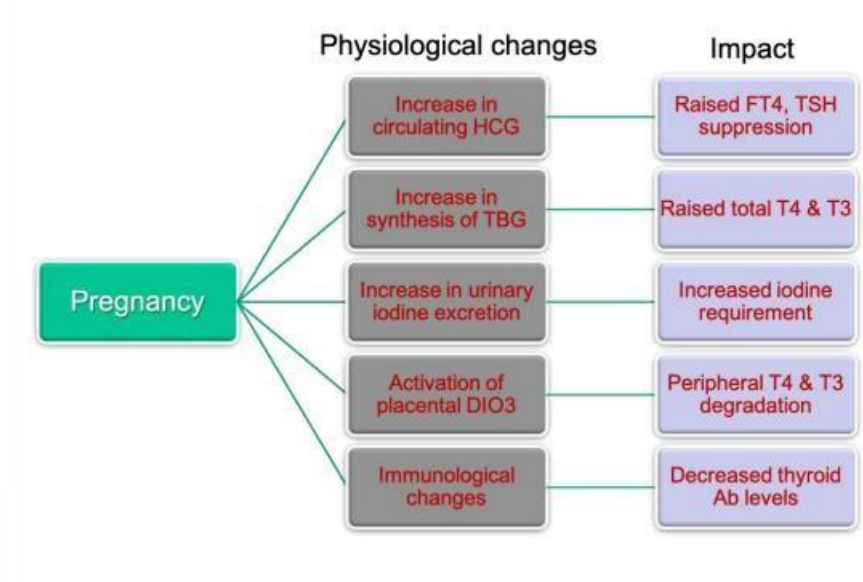
5) PREGNANCY WITH THYROID DISORDER

PHYSIOLOGY

The thyroid gland is a butterfly-shaped endocrine gland that is normally located in the lower front of the neck. The thyroid's job is to make thyroid hormones, which are secreted into the blood and then carried to every tissue in the body. Thyroid hormones help the body use energy, stay warm and keep the brain, heart, muscles, and other organs working as they should.

The thyroid gland can increase in size during pregnancy, This is usually only a 10-15% increase in size and is not typically apparent on physical examination by the physician. However, sometimes a significant goitre may develop and prompt the doctor to measure tests of thyroid function.[20]

Figure 5- Physiological hormone changes in pregnancy



PREGNANCY AND HYPOTHYROIDISM

Thyroid dysfunction is one of the common endocrine complications in pregnancy, especially hypothyroidism in pregnancy. Thyroid hormone (TH) is the most important endocrine hormone in the body, which can promote the synthesis of protein, RNA, DNA, and special enzymes in fetal tissues and cells, TH can regulate the metabolism of carbohydrates, calcium, phosphorus, fat, and other energy substances in pregnant women and fetus, and promote the growth and development of foetal bones and reproductive organs, and is very important to maintain the normal development and maturity of foetus.[20,22]

CLINICAL FEATURES

Lethargy, fatigue, increased weight which are also symptoms of pregnancy which makes diagnosis of hypothyroidism difficult.

EFFECT OF PREGNANCY ON HYPOTHYROIDISM

Pregnancy places significant demands on the maternal thyroid axis; for the first 18-20 weeks of pregnancy, the baby is completely reliant on the mother for thyroid hormone production. Furthermore, there is an increase in thyroxine binding globulin and thyroid hormone degradation by placental type 3 deiodinase[13], which increases demand. In pregnancy, urinary iodine excretion is highest in the first trimester and decreases in the second and third trimesters. The baby's thyroid begins to produce thyroid hormone on its own by mid-pregnancy. The baby, on the other hand, remains dependent on the mother for adequate iodine intake, which is required to produce thyroid hormones. To ensure adequate thyroid hormone production, the World Health Organization recommends a daily iodine intake of 250 micrograms. The pregnancy hormone beta hCG stimulates the thyroid to produce thyroid hormone, which helps the thyroid axis meet the increased demands of pregnancy. TPO antibody positive women may

have a reduced thyroidal response to hCG[21], according to new research. This could explain why women with thyroid autoimmunity who have positive thyroid peroxidase antibodies (TPO) have an increased risk of adverse obstetric outcomes that are not related to thyroid status.

EFFECT OF HYPOTHYROIDISMON PREGNANCY

Untreated or inadequately treated hypothyroidism has been linked to maternal anaemia, myopathy (muscle pain and weakness), congestive heart failure, pre-eclampsia, placental abnormalities, and postpartum haemorrhage (bleeding). Women with severe hypothyroidism are more likely to develop these complications. And it can impair the baby's brain development. Recent research suggests that children born to mothers who had mild untreated hypothyroidism during pregnancy may also have mild developmental brain abnormalities. Women who have hypothyroidism should have a TSH test as soon as their pregnancy is confirmed.[20,21] They also should immediately increase their levothyroxine dose, because thyroid hormone requirements increase during pregnancy. If new onset hypothyroidism has been detected, the woman should be treated with levothyroxine to normalize her TSH values.

PREGNANCY WITH HYPERTHYROIDISM

Hyperthyroidism complicates approximately 0.2% of pregnancies [23]. Hyperthyroidism is defined by excessive thyroid hormone production due to an overactive thyroid gland.

The most common cause of pre-existing hyperthyroidism is Graves' disease, an autoimmune hyperthyroidism caused by stimulation of the thyroid gland by thyroid-stimulating hormone receptor antibody (TSHRAb). The differential diagnosis includes toxic solitary thyroid nodule, multiple nodular goiter, exogenous thyroid hormone, amiodarone ingestion, excess iodine intake, and subacute thyroiditis.[22]

CLINICAL FEATURES

Many of the typical features are common in normal pregnancy, including heat intolerance, tachycardia, palpitations, palmar erythema, emotional liability, vomiting and goiter.

The most discriminatory features in pregnancy are weight loss, tremor, a persistent tachycardia, lid lag and exophthalmos. The latter feature indicates thyroid disease at some time rather than active thyrotoxicosis. Thyroid-associated ophthalmopathy may occur before hyperthyroidism and is present in up to 50% of patients with Graves' disease. If thyrotoxicosis occurs for the first time in pregnancy, it usually presents late in the first or early in the second trimester.

PATHOGENESIS

Graves' disease is responsible for nearly 85% of cases of hyperthyroidism during pregnancy. Graves' disease is an autoimmune disorder caused by antibodies that stimulate TSH receptors. "Gestational transient thyrotoxicosis," which is limited to the first half of pregnancy, is more common than Graves disease as the cause of thyroid function tests demonstrating hyperthyroxinemia. This condition is diagnosed in about 1-3% of pregnancies and is characterised by elevated FT4 and suppressed serum TSH. 2 This frequency varies by location and is secondary to elevated hCG levels. It is frequently associated with hyperemesis gravidarum, which is defined as early pregnancy nausea and vomiting with more than 5% weight loss, dehydration, and ketonuria. Hyperemesis gravidarum affects 3-10 pregnancies out of every 1,000. 3 Other conditions linked to hCG-induced thyrotoxicosis include multiple gestation and hydatidiform thyrotoxicosis. A TSH receptor mutation that causes functional hypersensitivity to hCG is also a rare cause of pregnancy-associated hyperthyroidism. Hyperthyroidism in women of childbearing age may be caused by toxic multinodular goitre or toxic adenoma, or it may be caused by subacute thyroiditis, acute thyroiditis, iodine, amiodarone, or lithium therapy[22]

EFFECT OF PREGNANCY ON THYROTOXICOSIS

During pregnancy, thyrotoxicosis often improves, especially in the second and third trimesters. As with other autoimmune conditions, pregnancy causes a state of relative immunosuppression, and levels of TSH receptor-stimulating antibodies may fall, resulting in improved Graves' disease and a lower need for anti-thyroid treatment. Exacerbations may occur in the first trimester, possibly due to hCG production, and in the puerperium, possibly due to a reversal of the fall in antibody levels seen during pregnancy (especially if there has been improvement during pregnancy).[21] Graves' ophthalmopathy is unaffected by pregnancy.

EFFECT OF THYROTOXICOSIS IN PREGNANCY

If thyrotoxicosis is severe and untreated, it is linked to ovulation inhibition and infertility. Those who do become pregnant and do not seek treatment have a higher risk of miscarriage, foetal growth restriction (FGR), preterm labour, and perinatal mortality. Sinus tachycardia, supraventricular tachycardia, and atrial fibrillation can all result from thyrotoxicosis. If not properly managed, the mother may develop a thyroid crisis (storm) and heart failure, especially during delivery. The maternal and foetal outcome is usually good and unaffected by thyrotoxicosis in those who have good control on anti-thyroid drugs or who have previously treated Graves' disease in remission. In rare cases, goitre retrosternal extension can cause tracheal obstruction or dysphagia. This is especially problematic if the patient needs to be intubated.

FETAL AND NEONATAL THYROID DYSFUNCTION

Improvement in Graves' hyperthyroidism during pregnancy is frequently associated with a decrease in the titer of maternal serum TRAb concentrations and a shift from stimulatory to blocking antibodies. If antibodies do not decrease, they will cross the placenta and stimulate the foetal thyroid, resulting in foetal hyperthyroidism, as evidenced by tachycardia, intrauterine growth retardation, cardiac failure, and the development of foetal goitre.[22]

As a result of the transplacental passage of maternal TRAb concentrations, one to five percent of neonates born to Graves' disease mothers have hyperthyroidism. Because antithyroid drugs administered to the mother are cleared from the foetal circulation more quickly than maternal stimulating antibodies, the onset of neonatal hyperthyroidism may be delayed. Maternal euthyroidism is especially important in the later stages of pregnancy, because poorly controlled hyperthyroidism can cause suppression of the foetal pituitary thyroid axis due to thyroxin transfer through the placenta. The illness can last up to six months. There are no known adverse pregnancy outcomes associated with subclinical hyperthyroidism**.**

DIAGNOSIS

Serum TSH may decrease in the first trimester of normal pregnancy as a physiological response to the stimulating effect of hCG upon the TSH receptor. A peak hCG level typically occurs between 7- and 11-weeks gestation. In particular, a serum TSH below 0.1 mU/L (in some cases even undetectable may be present in approximately 5% of women by week 11 of pregnancy.[22,23]

Any subnormal serum TSH value should be evaluated in conjunction with serum TT4 (or FT4) and T3 values.8 The biochemical diagnosis of overt hyperthyroidism is confirmed in the presence of a suppressed or undetectable serum TSH and inappropriately elevated serum TT4/FT4, or T3.

6) ASHTMA AND PREGNANCY

PATHOPHYSIOLOGY

•Asthma is a chronic inflammatory disorder of the airways characterized by increased responsiveness of tracheobronchial tree to multiplicity of stimuli with a major hereditary component

•This increased airway responsiveness and persistent sub- acute inflammation have been associated with genes on chromosomes 5, 11, and 12 that include cytokine gene clusters, β-adrenergic and glucocorticoid receptor gene, and the T-cell antigen receptor gene (McFadden, 2005)

•Around 30-40% of asthma patients report perimenstrual symptoms worsening. The possibility of female hormones influencing asthma appears obvious, though the exact mechanism is unknown. There is substantial evidence that female sex hormones have effects on several cells and cytokines involved in inflammation that are specifically attributed to oestrogens. B cell differentiation increases, T cell suppression activity and number decreases, and antibody production increases. Evidence suggests that progestrone can act as a glucocorticoid agonist and suppress basophil histamine release. Both oestrogen and progesterone are involved in eosinophillic infiltration in a variety of organs, and both can reduce the oxidative burst following phagocytic stimulation. Estradiol enhances eosinophillic adhesion to human mucus. Microvascular endothelial cells, the combined effect with the progesterone induces eosinophillic degrannulation. There appears to be a cyclic variation in lymphocyte β2 adrenoreceptor density in healthy women with higher levels during luteal phase. This upregulation is as a result of **progesterone rather than estrogen.**[15,16]

•In asthmatic women, in fact there is downregulation of β2adrenoreceptors. As pregnancy progresses and progesterone levels increases, similar effects may be seen causing worsening in control of asthma in some pregnant asthmatic women. Maternal plasma cortisol levels increase with pregnancy. Cortisol's effect on asthma during pregnancy are more variable. Several prostaglandins play a major role in asthma as bronchodilators and bronchoconstrictors, amniotic fluid contain large amounts of these PGs. There is a 10–30-fold increase in PGF2-alfa during pregnancy. And its levels have been found to correlate with estrogen levels

•In susceptible individuals, there is inevitably an environ- mental allergic stimulant such as influenza or cigarette smoke.

•There is also a possible influence of fetal sex and maternal asthma during pregnancy. Reports have suggested that asthma attacks or worsening asthma during pregnancy who are associated with female fetus. The mechanisms leading to changes require further investigation, one possible cause there may be abnormal levels of placental enzymes that may lead to reduced fetal growth in female infants of pregnant asthmatic women [16]

•Inflammation is caused by response of mast cell, lymphocytes, eosinophils, and bronchial epithelium. A number of inflammatory mediators by these and other cells include histamine, leukotrienes, prostaglandins, cytokines including IgE (Strunk and Bloomberg,2006)

•As F series prostaglandins and ergonovine exacerbate asthma, hence should be avoided if possible.

ANATOMICAL CHANGES IN SOFT TISSUES OF RESPIRATORY TRACT DURING PREGNANCY

•Reversible airway obstruction from bronchial smooth muscle contraction, vascular congestion, tenacious mucus, and mucosal edema. Hyperemia, friability, mucosal edema, and

hyper secretion of the airway mucosa are most pronounced in the upper airways, especially during the third trimester

•Nasal obstruction, epistaxis, sneezing episodes, and vocal changes may occur, and these may worsen when the individual lies down

•Nasal and sinusoidal polyposis is often seen and tends to recur in women with each pregnancy.

Caution- nasal decongestant spray should be used with because of their long-term effect on the mucosa.

PHYSIOLOGIC CHANGES DURING PREGNANCY

•Both hormonal and mechanical changes can influence the respiratory functions and can lead to an exacerbation of asthma

•A progesterone mediated first trimester causes an increase in tidal volume leading to secondary increase in minute ventilation volume

•Pregnancy induced hyperventilation leads to compensatory respiratory alkalosis, increase in PH may lead to more severe respiratory compromise than similar ABG in nongravid

•Mechanical changes include elevation of uterus, secondary elevation of diaphragm, decreased diameter of chest, and increased intra-abdominal pressure.[8]

CRITERIA FOR DIAGNOSIS

•A history of variable respiratory symptoms

•Typical symptoms are wheeze, shortness of breath, chest tightness, cough

•Usually have more than one of these symptoms

•The symptoms occur variably over time and vary in intensity

•The symptoms often occur or are worse at night or on waking

•The symptoms often occur with or worsen with viral infections

•Measurement of FEV1 and FVC by spirometry: FEV1/FVC ratios <0.7 and > 20% diurnal variation in PFFR for 3 or more days per week during a two week diary is diagnostic.[16]

Effects of pregnancy on asthma: Conventional wisdom is that asthma in pregnancy follows the "one-third rule"

•One-third will improve

•One-third will deteriorate

•One-third will remain unchanged.

Asthma during pregnancy has been associated with considerable maternal morbidity. Effects are variable.

EFFECT OF ASTHMA ON PREGNANCY

Compared with women without a history of asthma, women with asthma have been reported to have higher risks for complications of pregnancy even after adjustments for potential confounders.[16,17]

Risks are:

- Preeclampsia
- Gestational diabetes
- Placental abruption
- Placenta praevia
- Preterm birth

- Preterm premature rupture of the membranes
- Breech presentation
- Hyperemesis
- Pulmonary embolism
- Maternal intensive care admission
- Increased risk of congenital malformations associated with exacerbations in first trimester
- Increased incidence of cesarean section
- Status asthmatics—muscle fatigue with respiratory arrest, pnemothorax, pnuemomediastinum, acute cor pulmonale, and cardiac arrhythmias.

FETAL EFFECTS:

- With reasonable control of asthma, perinatal outcomes are generally good
- The fetal response to maternal hypoxemia is decreased umbilical blood flow, increased systemic and pulmonary vascular resistance, and decreased cardiac output. More severe maternal asthma, more is the fetal growth restriction
- Increased low birth weight
- Increased premature delivery
- Increased risk of fetal death Neonatal effects
- Increased neonatal hypoxemia
- Low newborn assessment scores

- Increased perinatal mortality

7) INFECTIOUS DISEASE IN PREGNANCY

Infection may occur at any time during gestation and their severity will vary depending on the virulence of the agent, the susceptibility and gestational age of the fetus, and the route of the infection. Route of transmission include The Routes of Transmission to the Fetus, Transplacental transmission (haematogenous), Transcervical transmission (relatively uncommon), Direct contact at birth.[25]

Secondary infections are usually not dangerous, due to production IgG antibioties produced by mother during the second time exposure will cross placenta and provide passive immunity for the fetus. During the first infection, the immune response of the mother is slow and it is characterized by the production of IgM that cannot cross the placenta, while the production of IgG occurs later during the course of infection. In this scenario, the fetus is more susceptible to damage if it acquires the infection because its own immune system is not completely developed.

Factors Affecting Effects of Infection

- Infecting dose
- Type and virulence of the organism
- Maternal response
- Route of infection
- Time (in gestation) of infection

EFFECTS OF INFECTION

- Teratogenic–Malformations such as congenital heart disease, microcephaly.
- Disruption – Destructive brain damage, coagulation failure, antepartum and post partum bleeding
- Growth restriction – Reduced cell numbers, placental damage, Preterm birth ,Low-birth weight, fetal distress, intra uterine death.
- Missed miscarriage and stillbirth.

9) DENGUE AND PREGNANCY

dengue fever was first reported in 1902 in Penang, malaysia (Skae, 1902). It has since become a major public health problem. Dengue is a mosquito-borne virus, belongs to Flaviviridae family and transmitted via the Aedes mosquito, which include Ae.aegypti and Ae.albopictus. there are four serotypes of DENV (DENV 1, DENV 2DENV 3, DENV4).[25,26]

CLINICAL FEATURES

Dengue infection can present four different clinical syndromes: undifferentiated fever, classical dengue fever, dengue hemorrhagic fever, or dengue shock syndrome (DSS). Classical dengue fever is defined as an acute febrile illness with two or more other clinical manifestations involving headache, retro-orbital pain, myalgia, arthralgia, rash, hemorrhagic manifestation, or leukopenia. Dengue hemorrhagic fever is characterized by fever, hemorrhagic tendencies, thrombocytopenia, and evidence of plasma leakage, as well as possible association with hepatomegaly and circulatory disturbances. Dengue shock syndrome is manifested when symptoms include rapid and weak pulse, narrow pulse pressure of less than 20 mmHg, and hypotension.

EFFECT ON PREGNANCY

Maternal death can be fatal outcome of dengue shock syndrome. DIC and acute kidney injury adverse outcome of pregnant women with DSS and needs critical care. Vertical transmission

10) TORCH AND PREGNANCY

A)CYTOMEGALOVIRUS (CMV)

Cytomegalovirus is a double-stranded DNA virus member of the family of herpes virus.

Infection can potentially occur from close contact with different body fluids such as saliva, blood, semen, urine and cervical secretion .[27]

PATHOLOGY

CMV enters the cell through fusion of the outer membrane of the cell and glycoproteins on the lipid envelope of virions. The DNA-containing protein capsid and the tegument proteins are released into the cell after the event of fusion. CMV infection recognizes two different stages: lytic and latent.

In lytic phase- DNA replication, structural components of the virion are assembled thus allowing the viruses to leave the infected cell.

In latent phase- minimization of viral gene expression, inhibition of the assembly and egress of new viral progeny. Latent phase can activate lyatic phase upon certain environmental, stimuli.

EPIDEMIOLOGY

CMV is the most common cause of fetal infection occurring in 0.5–2% of all live births

EFFECT ON FETUS

- CNS (ventriculomegaly, intra-ventricular haemorrhage, intra-ventricular adhesions, periventricular echogenicities, sub-ependymal cysts, periventricular leukomalacia, microcephaly, lissencephaly, porecephaly, cerebellar agenesis, hypogenesis, hypoplasia and haemorrhage, microphthalmia).
- Fetal growth restriction (FGR).
- Placental enlargement.
- Gastrointestinal tract (Hepatomegaly, splenomegaly, echogenic bowel, intrabdominal and liver calcification, ascites)
- Heart (cardiomegaly, pericardial effusions and calcifications)
- Non-immunehydrops.

B) TOXOPLASMOSIS

Toxoplasmosis gondi is a protozoan infection. Mother aquires infection by ingestion of uncooked or raw meat containing toxoplasma cysts. Water or food contaminated by oocysts excreted in the faeces of infected cats represents another source of infection. Transmission from the mother to the fetus occurs almost exclusively during a primary maternal infection, although in rare cases it may be due to reactivation of toxoplasma in immunocompromised patients.

EFFECT ON FETUS

Frequency of vertical transmission as high as 70% in 3rd trimester and during first trimester it is as low a 5-6% but the damage to the fetus is higher in the earlier stages of pregnancy.[27]

Overall risk of a symptomatic infection lesser than 5–8%.

Features of congenital toxoplasmosis

- CNS abnormalities (ventriculomegaly, calcifications in the brain parenchyma, periventricular zone and caudothalamic zone, periventricular echogenicity or cysts.
- Ocular abnormalities (cataracts).
- GI abnormalities (hepatomegaly, liver calcifications, ascites).
- Placental enlargement/thickening.

C)VERICECELLA AND PREGNANCY

Varicella zoster virus (VZV) is a highly contagious human alpha-herpes virus which causes varicella (chickenpox) and herpes zoster. Chickenpox is the consequence of a primary infection with VZV, herpes zoster is caused by the reactivation of the virus from its latency. Primary infection provides life long immunity, the virus persist in a latent form in the nucleus of the paraspinal cells and can potentially reactivate spreads through contact between the virus and the host is usually through the conjunctivae and the mucous membranes of the nasopharynx.

Epidemiology

incidence varies according to the latitude and climate, with a peak during late winter and early spring in temperate climes.

The host can potentially transmit the infection from 2 days before to 5 days after the onset of the rash, until the vesicles crust over (7–10 days). Pneumonia is serious complication occurs in 5-10% and mortality rate of < 1%.[28]

EFFECT ON FETUS

The rate of vertical transmission during the first and the second trimester has been reported to be at around 8–9% and congenital varicella syndrome occurs in about 10% of the fetuses developing infection (0.4–2% of all infected mothers), especially if maternal infection is

acquired before 20 weeks of gestation. If delivery occurs between 5 days before and two days after the onset of the rash. In this scenario, the lack of an adequate immune response from the mother results in low levels of IgG in fetal blood, thus predisposing the fetus to neonatal varicella that occurs in up to 30% of the cases.[28]

Features of Congenital Varicella Syndrome

- CNS abnormalities (mental retardation due to microcephaly and cortical atrophy)
- Limb hypoplasia
- Skin scarring
- Ocular abnormalities (cataracts, chorioretinitis)

8) HIV AND PREGNANCY

HIV infection remains a major global public health issue. Humans acquire it via the exchange of bodily fluids, mainly through unprotected intercourse, and women pass it on via mother-to-child transmission during pregnancy, childbirth, and breastfeeding. Other known means of transmission include the use of infected syringes by drug abusers and blood transfusions.

The human immunodeficiency virus (HIV) is the cause of the acquired immune deficiency syndrome (AIDS).There are five known human retroviruses (HIV-1, HIV2, HIV-I, HIV-II and HIV-IV) and three of them are associated with human disease. HIV-1, the most common cause of AIDS.[16,30]

EPIDEMIOLOGY

World Health Organization (WHO) in 2019, approximately 38 million people were living with HIV globally.2 In 2016, the American Foundation for Aids Research census showed that 51% of all adults living with HIV were women. In the absence of any intervention, mother to child trasmission ranges from 15%–45%. And Preventative strategies have reduced mother to child

trasmission to < 5%, with antiretroviral therapy (ART), there has been a 50% reduction in new HIV cases.

PATHOGENESIS

The virus only infects susceptible cells that express in their surface a glycoprotein called CD4, which is recognized by the glycoprotein gp120 that is present in the viral envelope. The best known susceptible cell in humans is the CD4 or T4 helper-inducer T lymphocyte. Invasion of these cells by the HIV-1 virus, by reverse transcriptase enzyme trascripts RNA into DNA. And viral DNA in into host cell DNA And transcription of viral DNA into RNAs and translation of viral RNA into viral components and virus replicates by destroying lymphocytes which alters the immunity and that is characteristic of AIDS.[30]

Fetal infection

The outstanding maternal factor is the severity of the disease that can be assessed immunologically by the number of CD4 cells or virologically by measuring the number of RNA

Copies.

risk of vertical transmission

- 0–10% if the viral load -1000 copies/ml
- 17% with viral loads - 1000–10,000 copies/ml
- 33% if the viral load - > 10,000 copies/ml.
- Rate of vertical transmission among all women with HIV infection on HAART
- 1% -1000 RNA copies/ml
- 6%-1000–10,000 RNA copies/ml
- 13% -10,000 RNA copies/ml

All infants of HIV-infected mothers have positive HIV serology as a consequence of the passive transfer of maternal antibodies. Levels of these antibodies decline gradually and by 6 months of age most non-infected newborns will be seronegative.

11)PREGNANCY AND JAUNDICE

The incidence of jaundice in pregnancy in India varies from 0.4 to 0.9/1000 deliveries. Maternal mortality is around 18%. Main causes of maternal mortality are coagulation failure, hemorrhage, hepatic coma, renal failure and septicemia. Incidence of preterm labor is increased and the perinatal mortality is around 23%.[1]

Jaundice is yellow discoloration of skin, conjunctiva, sclera and mucosa associated with rise in serum bilirubin above 2 mg/dL (normal 0.2–01 mg/dL) Latent jaundice: 1–2 mg/dL. It occurs due to increased production of bilirubin or impaired hepatocyte transport or conjugation or impaired excretion of bilirubin into intestine .[4]

The occurrence of hepatobiliary disease with or without jaundice during pregnancy presents obstetricians and hepatologists with an intriguing and urgent diagnostic challenge. Advances in understanding and management of pregnancy-specific liver disorders, as well as hepatobiliary disease in general, have resulted in significant improvements in maternal and foetal outcomes..[3]

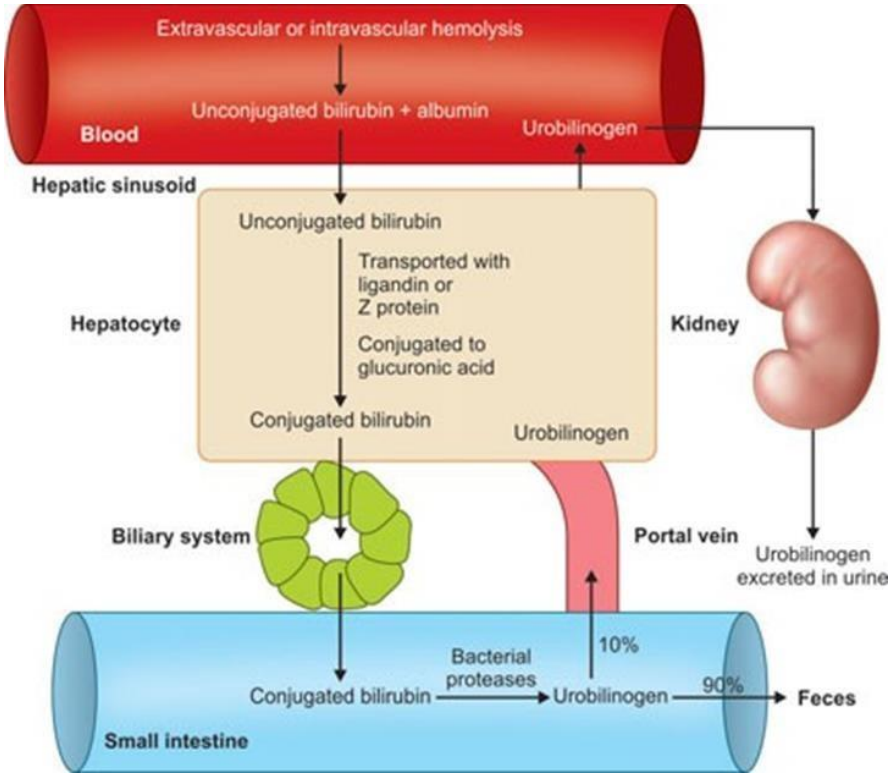


Figure 6 Mechanism of conjugation of bilirubin in liver

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LIVER IN NORMAL PREGNANCY

In pregnancy plasma volume increases by 50%, but with disproportionate increase in red cell mass by 20%, there is resultant hemodilution. This phenomenon should be kept in mind during interpretation of all serum concentrations used in evaluation of hepatic function during pregnancy. Serum albumin decreases, serum cholesterol, triglyceride and fibrinogen increases. Alanine aminotransferase (ALT), Aspartate aminotransferase (AST), prothrombin (PT), bile acid levels are not affected. Serum alkaline phosphatase level almost doubles due to its placental isozyme bilirubin, gamma- glutamyltranspeptidase slightly decreases .

Jaundice is a clinical manifestation of liver disorders or hematological disorders or some conditions unique to pregnancy.

Liver disorders that occur in pregnancy can be divided into three groups:

1 Liver diseases unique to pregnancy

- Hyperemesis gravidarum
- Intrahepatic cholestasis of pregnancy
- In pre eclampsia and eclampsia, HELLP syndrome
- Acute fatty liver of pregnancy

2 Liver diseases coincidental to pregnancy

- Viral hepatitis A, B, C, D, E herpes simplex
- Malaria, sickle cell crisis, leptospirosis
- Gallstones, Budd-Chiari syndrome
- Drugs

3 Pregnancy in preexisting liver disease

- Chronic viral hepatitis, hepatitis B virus (HBV), hepatitis C virus (HCV), nonalcoholic fatty liver disease
- Portal hypertension, autoimmune hepatitis, Wilson's disease
- Primary biliary cirrhosis, primary sclerosing cholangitis
- Liver tumors

A careful clinical history, physical examination, appropriate laboratory tests and radiological investigations should allow a diagnosis within short time. Liver biopsy rarely required.

<u>Important points in history</u>:

- Duration of jaundice, interval between symptoms and jaundice
- Exposure to contaminated food or water

• Exposure to medication over-the-counter (OTC), prescribed by physician, complementary or alternative, herbal or vitamin preparations, anabolic steroids, parenteral exposure, transfusions, intravenous abuse, tattoos, sexual activity, use of alcohol.

• Past history of jaundice may suggest chronic hepatitis, cirrhosis, intrahepatic cholestasis or genetic nonhemolytic hyperbilirubinemia

• Family history of hemolytic anemia , sickle cell disease, congenital hyperbilirubinemia. [4]

Symptoms

Yellow colouring of skin and eyes, pruritus, nausea, vomiting, weakness, fever, headache dyspepsia, anorexia, loss of appetite, fat intolerance, changes in color of urine (dark yellow) and stool (light colored), right upper quadrant abdominal pain, biliary colic, arthralgia, myalgia, rash, etc.

a) Pregnancy and Jaundice

Appearance of jaundice within 2 weeks of constitutional symptoms like nausea, vomiting, anorexia may suggest hepatitis or calculus biliary obstruction. If such symptoms appear more than 2 weeks prior to jaundice, it may suggest chronic hepatitis or alcoholism or exposure to toxins.

Signs and symptoms of liver disease in pregnancy are not precise, but the underlying disorder can have substantial effects on maternal and fetal outcome. Early recognition can be lifesaving."

In addition to routine clinical examination, systemic examination and obstetric evaluation, palpation of liver for enlargement, surface consistency, tenderness along with splenic enlargement and examination for ascites is helpful.

Skin may show scratch marks due to pruritus and bruising due to disturbed coagulation. Spider telangiectasia on trunk, arms, and hands may be normal in pregnancy but its presence ay suggest chronic hepatocellular jaundice. [4]

b) Intrahepatic Cholestasis of Pregnancy

Recurrent jaundice of pregnancy/cholestasis hepatosis/icterus gravidarum.

It is the second common cause of jaundice in pregnancy next to viral hepatitis.

Incidence 0.6%—variations due to genetic influence. Cause is unknown. High estrogen concentrations in susceptible or defects in secretion of sulfated progesterone metabolites may play a role. Some cases are related to many gene mutations that control hepatocellular transport systems (mutation of MDR 3 gene in progressive familial intrahepatic cholestasis). Drug like azathioprine impaired canalicular transport of bile acids and aggravate the disorder.

Main symptom is pruritus in late 2nd trimester, increases as pregnancy advances. Constitutional symptoms like anorexia, malaise are rare. Jaundice in 10% of cases. USG is helpful to exclude cholelithiasis and biliary obstruction. Pruritus usually precedes 3 weeks of abnormal biochemical tests and resolves 48 hours postpartum.

Fetal Complications

MSL due to increased colonic motility by bile acids, fetal distress and meconium passage, preterm labor, CTG abnormalities, RDS, IUD.

Fetal monitoring by CTG on alternate day and weekly assessment of amniotic fluid followed by elective delivery at 38 weeks of pregnancy.

Figure 7: Comparison of different causes of jaundice in pregnancy

Disorders	*Gestational periodat presentation*	*Prevalence*	*Symptoms*	*Specific laboratory tests*	*Outcome*	*Treatment*
Hyperemesis gravidarum	First trimester; resolves after 20 wk	<2% (primigravid)	Nausea and vomiting	AST, ALT <500 IU/L;ALT >AST; low TSH , bilirubin normal /mild rise	Electrolyte imbalance, complications of retching. Thiamine and vitaminK deficiency	IV fluids; thiamine pyridoxine; promethazine ondansetron
Intrahepatic cholestasis of pregnancy	Second trimester	<10% multifetal gestations	Pruritus is main symptom resolves in postpartum period	AST, ALT <1000 IU/L; GGT normal; bile acid levels high (10–14 umol /L; PT normal; bilirubin <6 mg/dL, clay stool, steatorrhea	Increased gallstones and risk for fetal distress, MSL increases. Reoccurs in subsequent pregnancy	UDCA, delivery if fetal distress is imminent or at 38 weeks
Eclampsia, preeclampsia	Beyond 20 weeks; recurs	5% multiparous, multifetal gestations	High blood pressure, proteinuria, edema, seizures, renal failure, pulmonary edema	Uric acid level elevated	Maternal mortality, 1%; prematurity and fetal death, 5–30%	Labetalol, nifedipine, methyldopa, magnesium sulfate; early delivery
HELLP syndrome	Beyond 22 weeks and after delivery; 20% progress from severe eclampsia	0.5%	Abdominal pain, seizures, renal failure, pulmonary edema, liver hematoma and rupture	Platelets <100,000/ mm3; hemolysis; high LDH level; AST, ALT 70–600 IU/L; Uric acid normal / elevated. Bilirubin up to 5–6 mg% in terminal stage	Hepatic rupture, with 60% maternal mortality; DIC 20–40%; fetal death, 1–30%	Prompt delivery, correction of coagulopathy, magnesium sulfate, antihypertensive drugs
Acute fatty liver of pregnancy	Third trimester; 50% have eclampsia	1/13,000 primiparous, multifetal gestations	Progress quickly to FHF, diabetes insipidus, hypoglycemia	TC elevated. Platelets <100,000/ mm3; AST, ALT >300 IU/L; PT elevated; fibrinogen level low; bilirubin level increased <10 mg%;. Hypoglycemia common. Uric acid elevated. CT scan may show fatty liver	DIC 75%, maternal mortality <20%; fetal mortality up to 45%	Prompt delivery; correction of coagulopathy, renal dysfunction, electrolyte imbalance. Liver transplantation controversial
Acute viral hepatitis	Any stage of gestation	No specific predilection but more common in women with risk factors like contaminated food and water or parenteral transmission or high risk sexual behavior	Nausea, vomiting, anorexia, headache. malaise, fever, epigastric pain may precede jaundice 1 to 2 weeks	ALT >1000 IU/ Bilirubin 5–20 mg% TC normal , uric acid and CT scan normal. DIC rare	Usually complete clinical cure except cases of chronic hepatitis B, HEV and HSV	Early delivery is not recommended

c) Acute Viral Hepatitis

Most common cause of jaundice in pregnancy. No increased risk of fetal malformation but perinatal mortality is increased due to higher rate of prematurity and stillbirth.[4]

Early Delivery is not Required

hepatitis D (B associated delta virus), hepatitis E. Immune response to virus causes hepatocellular necrosis.

Many infections are subclinical

- Symptoms like nausea, vomiting, headache, malaise may precede jaundice by 2 weeks
- Serum transaminase levels ranging from 400-4000 u/L and its peak may not correspond to disease severity
- S bilirubin levels are higher (5–20 mg/dL) may continuously rise.

Viral markers help in diagnosis.

- Coagulopathy can occur in fulminating hepatic necrosis”

Figure 8: Important features of different types of viral hepatitis

	Hepatitis A	*Hepatitis B*	*Hepatitis C*
Virus	• 27 nm RNA picornavirus	• DNA Hepadnavirus	• Single-stranded RNA flaviviridae virus
Mode of transmission	• Fecal-oral route • Ingestion of contaminatedfood, water or blood	• Parenteral route, IV drug abuse, homosexuals, blood and blood products, vertical transmission	• Same like hepatitis B, more prevalent in IV drug users, hemophilics and high risk sexual behavior, vertical transmission
Incubation period	• 4 weeks	• 6 weeks to 6 months	• 6–10 weeks
Antigens	• Hepatitis A antigen	• HBcAg core antigen • HBsAg surface antigen appear first, HBeAg-antigen suggest presence of viral particles and chronic infection • Sero+ve cases are at higher risk of hepatocellular carcinoma	• HCV core antigen
Antibodies	• IgM may appear as early as 5 days before symptoms and persists for several months	• Anti-HBc (IgM) appear within 4 weeksand persists up to 22 weeks • Anti-Hbc (IgG) appear after 6 weeks and persists longer. • Anti-HBs appear after at 22 weeks and persists for years. • Anti-HBe appear after 16 weeks and persists longer	• Anti-HCV antibodies may be detected after 15 weeks or may not be detectable. It usually does not prohibit transmission. So seropositivity and screening program is not useful in pregnancy
Chronic infection (hepatitis lasts longer than 6 months)	• Not seen	• 5–10% adults • 70–90% infants	• 86% of sero +ve cases have chronic infection
Fulminating hepatic necrosis and long-term complications	• Very rare	• Higher rate of fulminating hepatic necrosis, cirrhosis and hepatocellular carcinoma	• Very slow progression to cirrhosis (20–30 years)
Maternal mortality	• Can occur in under-privileged population. Incidence very low	• Higher incidence relatively	• Does not affect course of pregnancy, no increase in maternal mortality
Perinatal outcome	• Increased rate of preterm birth	• Increased rate of preterm birth, stillbirth with high viral load	• Does not affect course of pregnancy, no effect on perinatal outcome even incases of high viral load
Vertical transmission	• No transplacental transmission but it can occur in NICU in postpartum period	• Transplacental can occur. In postpartum period also through breast milk. Higher rate 85%	• 5–6%
Prenatal screening	• Not useful	• Helpful to diagnose chronic hepatitis andin prevention of neonatal transmission	• Not recommended
Co-infection with HIV	• No effect	• Relatively more common with increased liverrelated morbidity	• Does not worsen prognosisbut risk of vertical transmission is increased
Immunization	• *Active:* Formalin inactivated vaccine to susceptible persons • *Passive:* 0.02 mL/kg immunoglobulin for recent exposure during pregnancy	• High risk susceptible seronegative mother—Hepatitis B vaccine can be given during pregnancy • For baby at birth • Hepatitis B vaccine and immunoglobulin to neonate of hepatitis B seropositive mother. Complete vaccination lowers down the risk of transmission due to breastfeeding	• No vaccine because antibodiesdo not prevent transmission

Hepatitis D (Delta hepatitis)—Defective RNA virus (Hybrid particle with HBsAg coat and a delta core. Virus must co-infect with hepatitis B virus. Transmission is similar to hepatitis B. Chronic infection with B and D hepatitis is more severe and up to 75% of co-infected patients develop cirrhosis. Neonatal transmission is unusual in cases having vaccination of hepatitis B.

Hepatitis E—Waterborne RNA virus, enteric Transmission with epidemic outbreaks resembling hepatitis A. It is more severe during pregnancy with higher incidence of transplacental vertical transmission.

Herpes simplex virus: Many subclinical cases. Severe hepatitis in pregnancy and immunocompromised patients. Jaundice usually not present. Orogenital eruptions help in diagnosis. Confirmation by serology and inclusion bodies in liver biopsy. Mortality high up to 43%. Acyclovir is effective in treatment.

d) Other Causes of Jaundice in Pregnancy

• Leptospirosis, malaria, sickle cell crisis and hemolytic jaundice are treated as in nonpregnant woman

• Gall-stones: Pregnancy increases cholelithiasis. It may present as biliary colic, acute cholecystitis or acute pancreatitis. USG is helpful in diagnosis

• ERCP with minimal fluoroscopy can be done

• Cholecystectomy may be required, open or laparoscopic depending up on stage of gestation.

PREGNANCY IN PRE-EXISTING LIVER DISEASE

Chronic Hepatitis

Chronic hepatic necrosis, inflammation, and fibrosis leading to cirrhosis caused by HBV , HCV viruses, or autoimmune chronic hepatitis

The severity of the disease and the presence of portal hypertension influence pregnancy outcome. Because the long-term prognosis is poor, the woman should be counselled about the possibility of a liver transplant. Pregnancy termination and sterilisation.

Autoimmune Hepatitis

Autoimmune hepatitis is a progressive liver disease that predominantly affects women of all ages and can manifest at any time during gestation and the postpartum period.[4]

The disease activity is usually attenuated during pregnancy, and dosages of medication can be decreased because of the state of immune tolerance induced by the pregnancy.

Flares occur in 11% of patients during gestation and up to 25% in the postpartum period.[7]

There is an increased risk of prematurity, low-birth-weight infants, and foetal loss.

Pregnancy does not contraindicate immunosuppressive therapy. Both prednisone and azathioprine (FDA category D at dosages <100 mg/day) are considered safe during pregnancy and lactation.

Primary Biliary Cirrhosis and Primary Sclerosing Cholangitis

Primary biliary cirrhosis and primary sclerosing cholangitis are autoimmune diseases that can overlap with autoimmune hepatitis.

Pregnancy is rare in these conditions and carries a high risk of prematurity, stillbirths, and liver failure.

In patients with primary biliary cirrhosis, pregnancy can induce a new-onset pruritus or worsen a pre-existing pruritus."

Diagnosis is not different from that in the nonpregnant woman. Ursodeoxycholic acid is considered FDA category B and can be continued safely in pregnancy."

Primary sclerosing cholangitis is rarely described in pregnancy; pruritus and abdominal pain seem to be the major symptoms. Alkaline phosphatase and alfa-glutamyl transferase levels are elevated. Diagnosis relies on clinical and ultrasound findings. No specific treatment exists for primary sclerosing cholangitis, but ursodeoxycholic acid and stabilization of cirrhosis, when present, have been associated with good outcome.

Wilson's Disease

Wilson's disease is an inherited autosomal recessive defect of copper transport.

Fertility in Wilson's disease is decreased but can improve with therapy.[7] Treatment should be initiated before conception and should not be interrupted during pregnancy, because of the risk of fulminant liver failure. The treatment of choice in pregnancy is zinc sulphate 50 mg three times daily (FDA category C), because of its efficacy and safety for the foetus.

Patients who are treated with d-penicillamine (FDA category D) or trientine (FDA category C) before pregnancy require a dose reduction by 25—50% of that in the pre- pregnancy state

especially during the last trimester, to promote better wound healing if a caesarean section is to be performed.[3]

Cirrhosis and Pregnancy

Usually infertile but women with symptomatic cirrhosis and pregnancy have poor outcomes. Hepatic failure, variceal haemorrhage, preterm delivery, FGR as well as maternal death can occur.

Portal Hypertension and Oesophageal Varices

Intrahepatic or extrahepatic flow resistance may cause portal vein pressure to rise. Bleeding from oesophageal varices can be severe and fatal, especially if caused by cirrhosis. Controlling bleeding can be accomplished through endoscopic, band ligation or sclerotherapy, balloon tamponade, or trans jugular intrahepatic portosystemic stent shunting.Pregnancy after Liver Transplantation.

Close monitoring is required for hypertension, graft rejection, pre-eclampsia, and renal dysfunction. Perinatal mortality has also increased.

A coordinated team of senior obstetricians, hepatologists, haematologists, intensivists, neonatologists, and physicians should manage jaundice in pregnancy.

Early detection, timely obstetric intervention, improved foetal surveillance with anticipation, recognition, and proper management of complications such as haemorrhage, liver failure, renal dysfunction, coagulopathy, encephalopathy, acidosis, and cardiovascular stroke, as well as advanced neonatal services, have all improved maternal and neonatal outcomes..

Good antenatal care, early detection and treatment of preeclampsia, and screening and prophylaxis against viral hepatitis will reduce the incidence of jaundice during pregnancy.

AIMS AND OBJECTIVES

1. To study the Clinical profile of pregnant women with medical disorders.
2. To study the feto-maternal outcomes

METHODOLOGY

The study was conducted in DEPARTMENT OF OBSTETRICS AND GYNECOLOGY OF SHRI B.M PATIL MEDICAL COLLEG AND RESEARCH CENTRE (BLDE)DEEMED TO BE UNIVERSITY, VIJAYPUR, from January 2021 TO 31ST April 2022. This was a prospective observational study, including pregnant women with medical disorders according to inclusion criteria.

TYPE OF STUDY

A prospective observational study.

SOURCE OF DATA

All pregnant women with medical disorder visiting the department of obstetrics and gynaecology, willing to participate will be included as per inclusion and exclusion criteria as mentioned below.

INCLUSION CRITERIA

All pregnant women with the medical disorder such as

1. Cardiac disorders
2. Thyroid disorders
3. Epilepsy
4. Asthma
5. Chronic hypertension
6. Type 1 and Type 2 diabetes mellitus
7. Autoimmune disorders
8. Infection disease like HIV, HBsAg, CHICKENPOX

EXCLUSION CRITERIA

- Pregnancy-induced medical complications like (pregnancy-induced hypertension and HELLP syndrome, cholestasis of pregnancy, acute fatty liver of pregnancy, gestational diabetes mellitus)
- Postpartum cardiomyopathy

SAMPLE SIZE CALCULATION

- With 20%[2], anticipated Proportion of anaemia and Hypothyroidism among medical disorder in pregnancy, the study would require a sample size of **246** patients with 95% level of confidence and 5% absolute precision.

  Formula used

  - $n=\frac{z^2\, p*q}{d^2}$

  Where Z= Z statistic at α level of significance

  d2= Absolute error

  P= Proportion rate

  q= 100-p

STATISTICAL ANALYSIS

- The data obtained was entered in a Microsoft Excel sheet, and statistical analysis will be performed using statistical package for the social sciences (Version 20).
- Results were presented as Mean (Median) ±SD, counts and percentages and diagrams.
- Categorical variables were compared using the Chi-square test.
- Association between medical disorder in pregnancy and Outcome was compared using the Chi-square test.
- P<0.05 will be considered statistically significant.

METHOD OF COLLECTION OF DATA

In this study 246 pregnant women with medical disorders either diagnosed preconceptionally or diagnosed during routine antenatal screening were explained about the nature of the study and written and informed consent were taken.

Patients' sociodemographic datas was collected and chief complaints, past medical history, any surgical correction done for medical disease and obstetric history, menstrual history and family history were taken. The general and systemic examination was done.

Baseline investigations like Complete Blood Count, Peripheral Blood Smear, Liver Function Test, Renal Function Test, Random Blood Sugar, HIV test, HBsAg test, Routine urine and Obstetric USG done in all patients and necessary investigations depending upon suspected underlying medical conditions was done.

All pregnant women with medical disorder receiving standard medical line of management as per diagnosis reached, observed from the time of hospitalisation either to wards or to intensive care unit and the mode of delivery, intrapartum and post-partum events were studied. Pregnant women and neonates were followed up till the discharge or death. maternal and fetal outcomes were noted.

WHO definitions will be used to define patients with premature birth, stillbirth, abortion, primigravida, multipara, maternal mortality and low birth weight. Statistical analysis will be done by standard methods. Values will be expressed as mean ± standard deviation, counts and percentages and diagrams.

INVESTIGATIONS :

- HB%
- PT/INR
- HbA1c
- Random blood sugar
- Thyroid Profile
- LFT
- RFT
- HIV AND HBsAg
- OBSTETRIC USG
- 2D ECHO, CT SCAN, MRI

REVIEW OF LITERATURE

1) **Dang Arbinder et al[31] (2010**) concluded that obstetric cholestasis is a progressive condition, and an increase in liver function test results may indicate that the foetus is in danger of dying and must be delivered immediately. When it comes to acceptable upper limits of liver function test results, obstetricians are at a loss. If expectant management is continued for an exceedingly long period of time and an infant dies of asphyxia, the obstetrician is chastised for inaction. If the obstetrician decides to avoid asphyxia by immediately inducing labour and performing a caesarean delivery, the criticism may be viewed as unnecessary interference. A genetic, metabolic predisposition may also play a role in pathogenesis, influencing disease severity and outcome. A hereditary pattern of pregnancy cholestasis has been described, and autosomal dominant transmission has been proposed.

2) **Wiwanitkit V et al[32] (2010)** Chicken pox is a common viral infection that causes fever and discrete vesicular lesions. This infection is widespread in developing countries, particularly in tropical countries. Chicken pox can affect pregnant women, making it a serious obstetrical concern. The author elaborates and discusses chicken pox in pregnancy in this paper. The clinical presentation, diagnosis, treatment, and prevention are summarised briefly. Furthermore, the effects of chicken pox on pregnancy and vertical transmission are documented.

3) **Vatti RR et al[33] (2011)** Asthma is the most common serious medical condition that can complicate pregnancy, according to research. A third of pregnant women with asthma will have their symptoms worsen, a third will have their symptoms improve, and a third will have no change. The primary goal is to keep asthma under control for the sake of maternal health and well-being, as well as foetal maturation. Important patient education should cover the use of controller medication, avoiding asthma triggers, and treating asthma exacerbations as soon as possible. Asthma management should ideally begin during the preconception period. Pregnant women should avoid both active and passive smoking because it is the most modifiable risk factor for asthma. An increased risk of congenital malformations is associated with acute asthma exacerbation during the first trimester. Asthma that is poorly controlled is linked to low birth weight, preeclampsia, and premature birth. With a few exceptions, medications used to control asthma in the non-pregnant population are generally the same in pregnancy. The preferred controller therapy is inhaled corticosteroids (ICS). The preferred ICS is budesonide. Long-acting B-agonists (LABA) are the preferred ICS add-on therapy.

Viral infections and non-adherence to ICS are major triggers for asthma exacerbations during pregnancy.

4) **Navabakhsh B et al[34] (2011**) Hepatitis B virus (HBV) infection has been identified as a global public health issue. In endemic areas, HBV infection occurs primarily during infancy and early childhood, with mother-to-child transmission (MTCT) accounting for roughly half of chronic HBV infection transmission routes. MTCT prevention is a critical step in reducing the global burden of chronic HBV. Natal transmission accounts for the majority of MTCT, and giving newborns immunoprophylaxis is an excellent way to prevent natal transmission. Prenatal transmission accounts for the majority of MTCT that is not preventable through immunoprophylaxis**.** Because of the link between prenatal transmission and maternal viremia, some authors believe it is reasonable to prescribe lamivudine to women with a high viral load (more than 8 to 9 log 10 copies/mL). In addition to concerns about HBV transmission to the child, the combination of HBV infection and pregnancy raises a number of unique management issues. Chronic HBV infection during pregnancy is usually mild, but it can flare up after delivery or when therapy is stopped. Antiviral medications are indicated in a small subset of HBV-infected women with rapidly progressive chronic liver disease.

5) **Borgia G et al[35] (2012)** revealed that chronic hepatitis B virus (HBV) infection affects approximately 350 million people worldwide. Because of several peculiar and somewhat contentious aspects, managing HBV infection during pregnancy is difficult. The goal of this review is to provide a tool that will assist physicians in managing HBV infection during pregnancy. This review focuses on (1) the effect of HBV infection on pregnancy and the effect of HBV infection on pregnancy; (2) the potential viral transmission from mother to newborn despite at-birth prophylaxis with immunoglobulin and vaccine; (3) possible prevention of mother-to-child transmission

through antiviral drugs, the type of antiviral drug to use considering efficacy and potential teratogenic effect, as well as the timing of administration and discontinuation; and (4) the evidence for the use of elective lscs Vs vaginal delivery and breast feeding.

6) **Nanda S et al[36] (2012)** observedIn the United Kingdom, cardiac disease is the leading cause of maternal mortality. Cardiomyopathy, myocardial infarction, ischaemic heart disease, and thoracic aortic dissection are the leading causes of cardiac death in pregnancy. Rheumatic heart disease in pregnancy has resurfaced as the number of migrant women in the UK has increased. Women who have uncorrected congenital heart disease or who have had corrective or palliative surgery may have difficult pregnancies. Women who have metal prosthetic valves must make difficult decisions about anticoagulation during pregnancy, and they are at an increased risk of haemorrhage. Not all women with significant heart disease are able to meet pregnancy's increased physiological demands. Pregnant women with heart disease require a multidisciplinary approach that includes obstetricians, cardiologists, and anaesthetists. This allows for appropriate monitoring of maternal and foetal well-being, as well as planning and documentation of elective and emergency delivery management. This article discusses the most common cardiac conditions encountered during pregnancy, as well as their antenatal and intrapartum management.

7) **Ramprasad M et al[37] (2012)** Thyroid disorders are common in pregnancy, with subclinical hypothyroidism being the most common. Because of the complex hormonal changes that occur during pregnancy, it is important to remember that thyroxine requirements are higher. The recommended reference ranges for TSH in the first trimester are 0.1 to 2.5 mIU/L, 0.2 to 3.0 mIU/L in the second trimester, and 0.3 to 3.0

mIU/L in the third trimester, according to recent American Thyroid Association (ATA) guidelines. Maternal hypothyroidism is a treatable condition linked to an increased risk of low birth weight, foetal distress, and delayed neuropsychological development. Because conception is difficult, hyperthyroidism in pregnancy is uncommon. The majority of them are caused by Graves' disease, though gestational hyperthyroidism is a possibility**.**

8) **Stagnaro-Green A et al[38] (2012)** demonstrated that the thyroid gland is significantly stressed during pregnancy. Total T(3) and T(4) levels rise by 50% during pregnancy as thyroxine-binding globulin levels rise by 50%. Serum TSH levels fall during the first trimester and rise during the second and third trimesters, but not to pre-pregnancy levels. Hypothyroidism affects up to 3% of pregnant women. Subclinical hypothyroidism during pregnancy is linked to an increased risk of miscarriage and preterm delivery, as well as a decrease in the child's IQ. Although overt hyperthyroidism affects less than 1% of pregnant women, it has been linked to an increased risk of miscarriage, preterm delivery, and maternal congestive heart failure. Thyroid autoantibodies are linked to an increased risk of breast cancer in euthyroid women. Postpartum thyroiditis affects 5.4% of all pregnant women; additionally, 50% of women who are euthyroid in the first trimester but test positive for thyroid autoantibodies will develop postpartum thyroiditis. The need for the essential nutrient iodine increases during pregnancy and in breastfeeding women, and the effect of mild iodine deficiency treatment on maternal and foetal outcomes is being evaluated in a prospective study. The pros and cons of universal screening for thyroid disease during pregnancy are still being debated.

9) **Giles W et al[39] (2013)** Asthma is one of the most common medical conditions among women of childbearing age, according to a study. There is now evidence that asthma is not a benign condition in terms of maternal and foetal health. Despite this, there are a number of issues that arise in the management of such women. Because pregnant women and/or their clinicians believe they pose a risk to the foetus, optimal asthma treatments are often discontinued or reduced. There is also a lack of clinician awareness of the pregnancy complications of asthma.

10) **Murphy VE et al[40] (2015)** Asthma is a common comorbidity during pregnancy, and its prevalence in the general population is rising. Exacerbations are a major clinical problem during pregnancy, requiring medical attention in up to 45% of women and resulting in poor outcomes for mothers and babies, such as low birth weight and preterm delivery. Effective asthma management in pregnancy aims to keep asthma under control while also preventing exacerbations. This is accomplished by attempting to avoid symptoms during the day and night while maintaining lung function and normal activity. Maintaining foetal oxygenation is also an important consideration during pregnancy. Guidelines recommend that asthma advice and reviews be provided prior to conception, as well as actively managing asthma during pregnancy with regular 4-weekly reviews and the provision of a written action plan. Improvements. Treatment adjustment using an eosinophilic lung inflammation marker, the exhaled nitric oxide fraction, has shown success in reducing pregnancy exacerbations. The use of an algorithm that adjusted inhaled corticosteroids based on the fraction of exhaled nitric oxide and added long-acting -agonists when symptoms remained uncontrolled resulted in fewer exacerbations, more women on inhaled corticosteroids but at lower mean doses, and improved infant

respiratory health at 12 months of age. More research is needed to determine whether this strategy can improve perinatal outcomes and be successfully implemented in clinical practise.

11) **Yalamanchi S et al[41] (2015)** revealed that recognising and managing thyroid disease during pregnancy is difficult, with contradictory recommendations from various professional organisations. They conduct a review of the literature on the diagnosis and treatment of gestational hypothyroidism and hyperthyroidism. They also go over thyroid nodules, postpartum thyroiditis, and thyroid cancer. The evidence clearly shows that overt hypothyroidism and hyperthyroidism should be treated, but there is disagreement about how to treat subclinical hypothyroidism and thyroid antibody positive euthyroidism, as well as whether pregnant women should be screened for thyroid disease. Appropriate thyroid disease management during pregnancy is critical for maternal and foetal health, particularly the recognition and treatment of hypothyroidism and thyrotoxicosis.

12) **Nazarpour S et al[42] (2015)** It was discovered that pregnancy has a significant impact on thyroid function in both healthy and thyroid dysfunction women. Thyroid dysfunction is relatively common among pregnant women. The goal of this review was to raise awareness and provide a review of the negative effects of thyroid dysfunction on pregnancy outcomes, including hyperthyroidism, hypothyroidism, and thyroid autoimmune positivity. For this review, appropriate keywords were used to search Medline, Embase, and the Cochrane Library for relevant English manuscripts. They used randomised clinical trials, cohort studies (both prospective and retrospective), case-control studies, and case reports. Thyroid disorders in non-pregnant women studies and

articles of poor quality were excluded. Overt hyperthyroidism and hypothyroidism both have a negative impact on pregnancy outcomes. Abortion, anaemia, pregnancy-induced hypertension, preeclampsia, placental abruption, postpartum haemorrhage, premature birth, low birth weight, intrauterine foetal death, increased neonatal respiratory distress, and infant neurodevelopmental dysfunction were all linked to overt hypothyroidism . The effect of subclinical hypothyroidism and thyroid antibody positivity on pregnancy outcomes, on the other hand, was unclear. While some studies found that pregnant women with subclinical hypothyroidism or thyroid autoimmunity had a higher risk of placental abruption, preterm birth, miscarriage, gestational hypertension, foetal distress, severe preeclampsia, and neonatal distress, as well as diabetes, others did not. While the effects of overt thyroid dysfunction on feto-maternal morbidity and its long-term impact on childhood development have been clearly identified, data on the early and late complications of subclinical thyroid dysfunction during pregnancy or thyroid autoimmunity are lacking.

13) **Voinescu PE et al[43] (2015)** Over a million women with epilepsy in the United States are of childbearing age, necessitating careful consideration of not only the type of antiepileptic drug, but also the dosage, in the event of a planned or unplanned pregnancy. Careful antiepileptic drug selection can reduce the potential adverse effects of antiepileptics drugs while maintaining seizure control for the health of not only the patient, but also the mother and unborn foetus. In the last 20 years, the number of treatment options has increased significantly, and remarkable progress has been made in characterizing the risks that antiepileptic drug pose to pregnant women and fetuses. Teratogenesis data are now robust, and there is a growing body of data on

neonatal/obstetrical outcomes and neurodevelopmental problems associated with each anti-epileptic drug.

14) **Elkayam U et al[44] (2016)** showed that the incidence of pregnancy in women with cardiovascular disease is increasing, owing primarily to an increase in the number of women with congenital heart disease reaching childbearing age and changing demographics associated with maternal ageing. Although most cardiac conditions are well tolerated during pregnancy and women can give birth safely and with good outcomes, there are some cardiac conditions that cause significant maternal and foetal morbidity and mortality. The goal of this paper is to review the available published reports and make recommendations for the management of pregnant women with high-risk cardiovascular conditions.

15) **Alemu A et al[45] (2016)** Thyroid dysfunctions such as hypothyroidism, thyrotoxicosis, and thyroid nodules have been discovered to develop during pregnancy, resulting in abortion, placental abruptions, preeclampsia, preterm delivery, and reduced intellectual function in the offspring . Maternal thyroid hormone plays an important role in foetal neurologic development and maternal health , according to epidemiological data. It has been proposed that the harmful effects of thyroid dysfunction can extend beyond pregnancy and delivery to affect neuro-intellectual development in the child's early life. The maternal thyroid gland faces a significant challenge during pregnancy, as hormone requirements increase due to an increase in thyroid-binding globulin, the stimulatory effect of HCG on TSH receptors, and increased peripheral thyroid hormone requirements. Early abortion, preterm delivery, neonatal morbidity, and other obstetrical

complications are all associated with maternal thyroid dysfunction. Early detection of thyroid dysfunction in pregnant women, as well as treatment of thyroid dysfunction during pregnancy, is critical for avoiding both foetal and maternal complications caused by thyroid dysfunction. The goal of this review was to evaluate the thyroid function changes that occur during pregnancy , the various disorders and their maternal and foetal implications, laboratory diagnosis, and the best ways to manage these conditions.

16) **Borgelt LM et al[46] (2016)** In the United States, more than one million women with epilepsy are of childbearing age, and over 20,000 babies are born each year. Patients with epilepsy who become pregnant face risks such as changes in seizure frequency, maternal morbidity and mortality, and congenital anomalies caused by antiepileptic drug exposure. Appropriate epilepsy management during pregnancy may include frequent monitoring of antiepileptic drug serum concentrations, potential preconception switching of antiepileptic medications, dose adjustments, minimising peak drug concentration with more frequent dosing, and avoidance of potentially teratogenic medications. Preconception planning should ideally be done to reduce risks to both the mother and the foetus during pregnancy. Recognizing the benefits and risks of current and emerging therapies is critical, especially with revised pregnancy labelling in prescription drug product information. This review will outline the risks of epilepsy during pregnancy, examine various recommendations from leading organisations, and provide an evidence-based approach to managing epileptic patients before, during, and after pregnancy.

17) **Patel SI et al[47] (2016)** demonstrated that the clinical management of pregnant women with epilepsy on antiepileptic drugs presents unique challenges. The goal of treatment is to achieve optimal seizure control while exposing the foetus to as few antiepileptic

drugs as possible in order to reduce the risk of structural and neurodevelopmental teratogenic effects. This paper examines the following key issues concerning pregnant women with epilepsy: antiepileptic drug pharmacokinetics, clinical management of antiepileptic drugs ,seizure frequency, major congenital malformations, neurodevelopmental outcomes, perinatal complications, and breast feeding are all topics covered.

18) **Sarladevi et al[48] (2016)** This study found a significant frequency of thyroid disorders (11.6%), particularly hypothyroidism in pregnant women, as well as subclinical and overt hypothyroidism (6.4% and 2.8%, respectively). Although pregnancy-related hyperthyroidism is rare, the effects on the mother and foetus are serious. Early detection of thyroid abnormalities and rapid treatment initiation are crucial due to the significant influence that maternal thyroid disorders have on mother and foetal outcomes. Therefore, it should be thought of universally screening expectant women for thyroid disorders, especially in a nation like India where there is a high prevalence of undetected thyroid disorders.

19) **Dadhwal V et al[49] (2017)** There is conflicting data on the effect of HIV infection and antiretroviral therapy (ART) on pregnancy outcome. The study's goals were to compare pregnancy outcomes in women with and without HIV infection, as well as to assess the effect of HAART on pregnancy in HIV-infected women. This is a prospective case record analysis of 212 HIV-infected women who gave birth in an Indian tertiary health care centre between 2002 and 2015. The pregnancy outcomes of HIV-infected women were compared to the outcomes of 238 HIV-uninfected controls. Women were given

ART to prevent mother-to-child transmission according to a protocol that changed throughout the study period. The impact of ART use on preterm birth and foetal growth restriction (FGR) was investigated. Preterm birth, FGR, and anaemia were more common in HIV-infected women (9.4%, 9.9%, 5.2%) than in uninfected women (7.6%, 5%, 3.8%), but this did not reach statistical significance (P-value >0.05). The prevalence of PIH, diabetes mellitus, and pregnancy intrahepatic cholestasis was comparable in both groups. The mean birth weight of HIV-infected women's neonates (2593.60499g) was significantly lower than that of HIV-uninfected women's neonates (2919459g) [P-0.001]. Admissions to neonatal intensive care units were also considerably higher in infants born to HIV-infected mothers (P-value=0.002). Preterm labour and FGR were less common in HIV-infected women on ART. Pregnancy outcomes in HIV-infected women can be gotten better with good antenatal care and a multidisciplinary team approach.

20) **Adam K et al[50] (2017)** found that patients with cardiovascular disease represent a significant cohort at risk for complications during pregnancy. The normal physiologic changes of pregnancy could further compromise the hemodynamics of various cardiovascular conditions, resulting in clinical deterioration and even death. The fetus of a gravida with cardiovascular disease also has an increased risk of morbidity, including an increased risk of inherited cardiac genetic disorders, fetal growth restriction, and premature delivery. These complications also increase the risk for antenatal and perinatal mortality. Ideally, the management of a patient with cardiac disease who is considering pregnancy should start with pre-conception counselling that outlines the maternal and fetal complications associated with her particular cardiac disorder. The pregnancy is best managed by a dedicated team of specialists in maternal-

fetal medicine, cardiology, cardiovascular surgery, anaesthesiology, and neonatology, preferably in a tertiary care centre.

21) **Baral G et al[51] (2017)** studied that the most frequent medical condition in pregnancy is hypertension, which is followed by kidney and urinary tract infections. Acute illnesses and Endocrine issues can impact pregnancy as well. The third common category of medical illnesses includes viral infections and endocrine problems. Therefore, for better results, pregnancy management calls for interdisciplinary intervention.

22) **Bhaskar Narayan et al [52] (2017)** concluded that despite a significant decline in maternal death overall, treatable medical conditions-related maternal mortality and morbidity have not declined in recent years. The training of doctors in the treatment of pregnant patients, particularly pre-conception counselling, needs to be improved as part of the answer. Early diagnosis of acute sickness and effective management of chronic illnesses are clearly beneficial, and most medications and many radiological tests can be utilised during pregnancy.

23) **Khuda I et al[53] (2018)** showed that in the context of local culture and misconceptions regarding epilepsy, Saudi practitioners need a careful management plan for women with epilepsy that satisfies all the patients' needs and ensures their spouses' understanding. Such a management strategy needs to incorporate careful selection and monitoring of anti-epileptic drugs and regular counselling of patients. Female epileptic patients in the reproductive age group, no matter whether they are pregnant or not, should be managed

by safest drugs from the earliest with folic acid supplementation along with adequate pre-marriage/conception counselling. All antiepileptic drugs are potentially teratogenic. However, valproic acid, phenytoin, phenobarbitone, and topiramate are least favoured for use. Monotherapy is preferred over polytherapy, and the least possible dose should be used. During pregnancy, many epileptic women may need monthly drug level monitoring and dose readjustments. Normal vaginal delivery is safe in epileptic women. Post-partum follow-up with anti-epileptic drug titration may be required.

24) **Sushruta Shrivastava et al[2] (2018)** concluded that Pregnancy-related illnesses are complex and have a large potential to harm both the mother and the foetus. Early diagnosis allows for simple treatment with little negative consequences on the mother or foetus. Therefore, these illnesses require early discovery, timely treatment, and consistent follow-up. Most significantly, patients who receive enough information regarding danger sign awareness and timely access to medical facilities will enhance maternal and foetal outcomes**.**

25) **Bonham CA et al[54] (2018)** observed Asthma during pregnancy is a common and growing threat to the health of women and their children. The current article reviews recent findings in the epidemiology of asthma during pregnancy, demonstrating the numerous short- and long-term risks to mother and foetus from poorly controlled maternal asthma. They also discuss new evidence that active asthma management during pregnancy can improve, if not completely eliminate, these negative outcomes. Recent high-quality trials examining best asthma treatment methods are reviewed and synthesised to provide an evidence-based pathway for comprehensive asthma treatment

in the outpatient setting. Safe and effective medications for asthma during pregnancy, as well as nonpharmacologic interventions, are discussed, and treatment options for related pregnancy conditions, such as depression, rhinitis, and gastroesophageal reflux, are presented. Throughout, they emphasise the importance of a thorough patient evaluation, patient education, objective measurement of asthma control, and frequent and supportive follow-up. The cardiovascular and respiratory physiology of pregnancy is discussed, as well as its implications for the management of asthma patients, including those who require intubation and mechanical ventilation. An approach to the critically ill pregnant patient with status asthmaticus is detailed when outpatient asthma management has failed. Multidisciplinary teams of pulmonary specialists, obstetricians, primary care providers, nurses, pharmacists, and asthma educators enhance patient care.

26) **Wilkerson RG et al[55] (2019)** Chronic hypertension, gestational hypertension, preeclampsia-eclampsia, and chronic hypertension with superimposed preeclampsia were discovered to be the four categories of hypertensive disorders of pregnancy. These conditions are among the most common causes of maternal and foetal morbidity and mortality. Proper diagnosis in the emergency department is critical for initiating appropriate treatment and minimising potential harm to the mother and foetus. When blood pressure exceeds 160/110 mm Hg or there are other severe features such as acute kidney injury, elevated liver function tests, severe abdominal pain, pulmonary oedema, or central nervous system disturbances, prompt management should be initiated.

27) **Braunthal S et al[56] (2019)** Hypertensive disorders of pregnancy, which include preexisting and gestational hypertension, preeclampsia, and eclampsia, have been found to complicate up to 10% of pregnancies and to be a significant cause of maternal and

perinatal morbidity and mortality. Despite differences in guidelines, there appears to be agreement that severe and non-severe hypertension with evidence of end-organ damage must be controlled; however, ideal target ranges below 160/110 mmHg remain a source of debate. This review discusses the definition, pathophysiology, therapeutic goals, and treatment agents used in pregnancy hypertensive disorders.

28) **Sushila Chaudhary et al[58] (2019)** concluded that Hypertensive disorders in pregnancy were found to be the most common, followed by anaemia and liver disease. Medical disorders in pregnancy are considered high risk and must be managed through a team effort and intensive care setup.

29) **Somers EC et al[57] (2020)** Autoimmune diseases are more common in women than in men, and pregnancy-related factors such as hormonal modulation and foetal microchimerism may influence the risk of maternal AID in the future. Optimizing reproductive health in women with AIDS necessitates a continuum of multidisciplinary care that begins long before the desire for pregnancy is expressed. Family planning is essential in order to time pregnancy when the disease is stable and to allow for medication adjustments. When using contraception, the method chosen must take underlying disease and laboratory features into account. Options for preserving ovarian health and fertility should be considered for females undergoing gonadotoxic therapy, even if they are not planning a future pregnancy. Multispecialty care, as well as close monitoring during pregnancy and the postpartum period, improves both maternal and foetal outcomes when treatment regimens compatible with pregnancy are maintained to control underlying disease activity.

30) **Wang H et al[59] (2020)** Asthma in pregnancy is a serious health concern, according to the findings. Physiological changes and drug compliance during pregnancy can have varying effects on asthma control, and the level of asthma control and the side effects of asthma medications are closely related to the adverse perinatal outcomes of mother and foetus. This article provides an update on the available literature regarding the alleviating or aggravating mechanisms of asthma in pregnancy, as well as diagnosis, disease assessment, and systematic management, in order to provide new guidance for physicians, obstetric joint doctors, and health care practitioners.

31) **Couillard S et al[60] (2021)** It was discovered that to update obstetric care providers on asthma management. The most common comorbid chronic illness in pregnancy is asthma. Uncontrolled asthma increases the risk of maternal, foetal, and neonatal complications, according to convincing evidence. Unfortunately, one in every four pregnant women does not use an inhaler, and it is likely that decreased adherence, rather than pathological changes, explains uncontrolled maternal asthma. Surveys of patients reveal a desire for information and reassurance. Although some molecules are preferred during pregnancy, there is currently no reason to refrain from taking any asthma medication, old or new. Blood eosinophils and fractional exhaled nitric oxide are effective biomarkers for predicting asthma attacks and the likelihood of responding to inhaled steroids. In addition, practice-changing trials in mild asthma

32) **Sirilert S et al[61] (2021)** exclaimed that this review aimed to provide an update on the impact of pregnancy on the natural course of hepatitis B virus (HBV) infection and also on the impact of HBV infection on adverse pregnancy outcomes, including mother-to-

child transmission (MTCT). For the literature review, original research articles, review articles, and guidelines were narratively reviewed and comprehensively validated. The databases of PubMed, EMBASE, and CINAHL were carefully searched for articles in English on topics related to HBV infection, pregnancy, and vertical transmission from 1960 to May 2021. Immunological changes during pregnancy such as suppression of Th1 response and induction of Th2 immunity lead to an impaired immune reaction to HBV and stimulate viral activity along with the reduction of CD8 T cells to escape immune detection. The impact of pregnancy on the natural course of chronic HBV infection seems to be minimal, while pregnancy can increase morbidity and mortality in the case of advanced HBV hepatitis or cirrhosis. Importantly, hepatitis flare or alanine aminotransferase (ALT) flare can occur during pregnancy and is more common during the postpartum period due to the interaction between HBV and the immune response. Interestingly, the impact of HBV infection on adverse pregnancy outcomes is more serious than ever thought. Updated evidence indicates that pregnancies with chronic HBV infection increase the risk of preterm birth and gestational diabetes, especially in cases of positive hepatitis e antigen (HBeAg).

33) **Błaszczyk B et al[62] (2022)** showed that Epilepsy affects an estimated 60 million people worldwide, with women accounting for half of those affected. One-third of epileptic women are of childbearing age. Childbirth rates in women with epilepsy are approximately 20-40% lower than in the general population, which may be due in part to a lower number of these women being in relationships. Lower fertility in women with epilepsy may be related to the disease, but it is primarily due to the treatment. Valproate, an antiepileptic drug that inhibits histone deacetylases, may influence the expression of

genes involved in cell cycle control and differentiation. Clearly, this drug is linked to the risk of malformations, though other antiepileptic drugs may also cause birth defects, albeit to a lesser extent.The main mechanism responsible for all negative effects of prenatal exposure to valproate seems inhibition of histone deacetylases. Animal studies show a reduction in the expression of genes involved in social behaviour and an increase in hippocampal cytokines. Valproate-induced oxidative stress may also contribute to neural tube defects. Interestingly, paternal exposure to this antiepiptic drugs in mice may trigger neurodevelopmental disorders as well although a population-based cohort study does not confirm this effect. To lower the risk of congenital malformations and neurodevelopmental disorders, a single Antieptic drugs at the optimal dose and supplementation with folic acid is recommended. VPA should be avoided in women of childbearing age and especially during pregnancy.

RESULTS

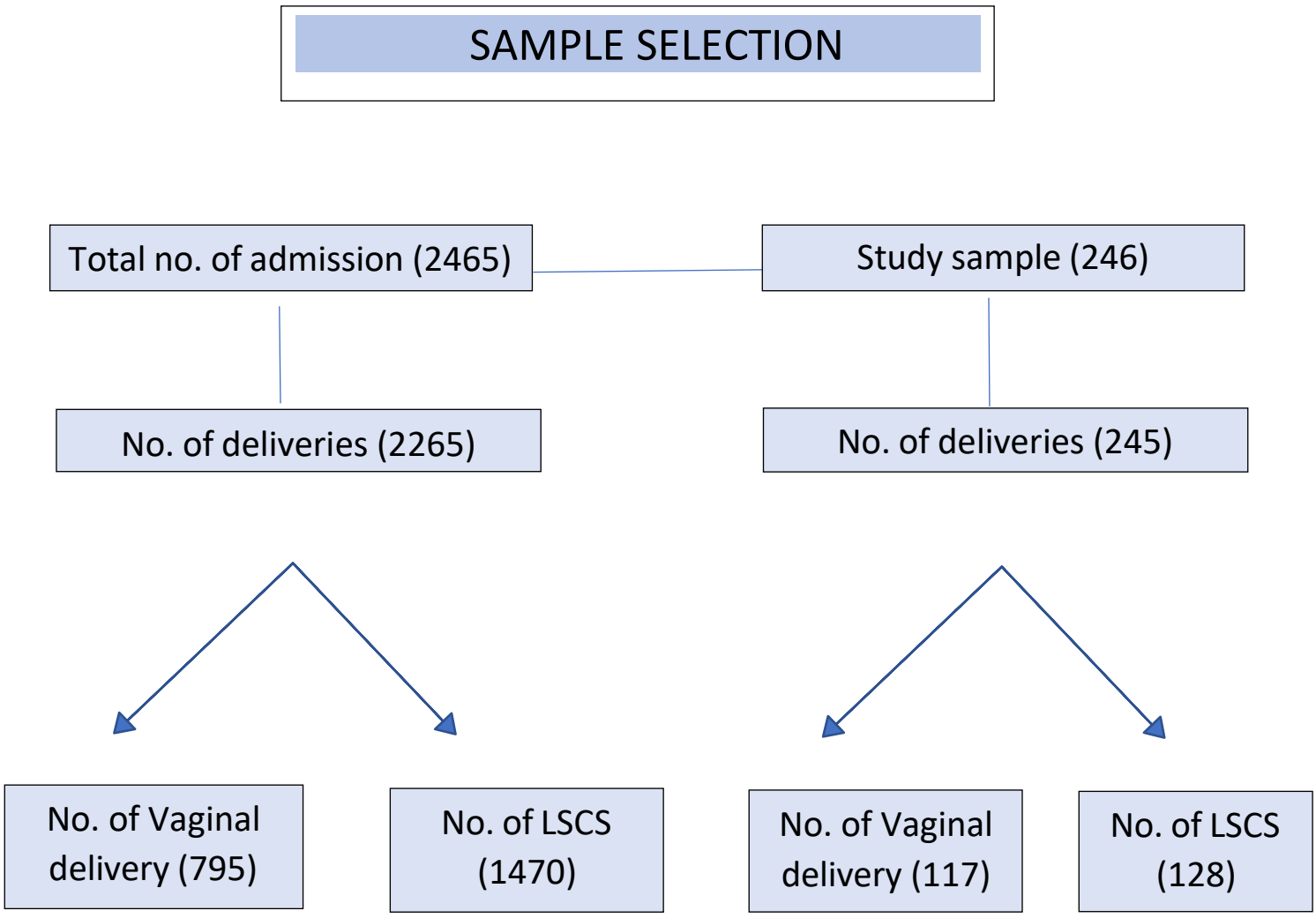


Table 1: Socio-demographic data

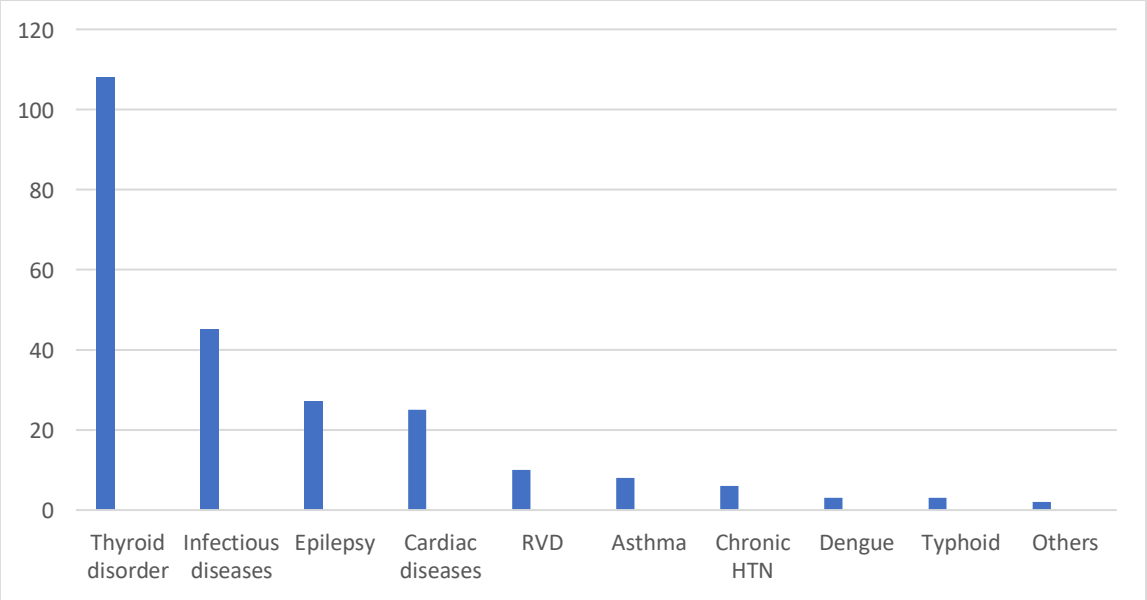
Age Group		
Age group	**Frequency (N=246)**	**Percentage (%)**
18-25 years	120	48.8%
26-30 years	84	34.1%
31-35 years	34	13.8%
>35 years	8	3.3%
The mean age of the study population was 26 ± 4.58 years with minimum age of 18 years and maximum age of 38 years.		
Distribution of the locality		
Locality	**Frequency (N=246)**	**Percentage (%)**
Rural	162	65.9%
Urban	84	34.1%
Distribution of the Obstetric history		
Gravida	**Frequency (N=246)**	**Percentage (%)**
Primigravida	87	35.4%
Multigravida	159	64.6%
Distribution of Study Population according to POG		
Period of Gestation (POG)	**Frequency (N=246)**	**Percentage (%)**
28-32 weeks	7	3.6%
33-36 weeks	35	13.4%
>37 weeks	203	82.5%
The mean gestational age of the study population was 37±4.5 weeks		

In this study, majority of women were in the age group 18-25 years (48.8%) and mean age group was 26 ± 4.58 years. The mean gestation age was 37 ± 4.5 weeks and 65.9% belonging to rural area and 34.1% belonging to urban area. Most cases were multigravida - 64.6% and the primigravidae were 35.4%.(Table 1)

Table 2: Distribution of the medical conditions

Medical Conditions	Frequency	Percentage (%)
Thyroid abnormality	108	43.8%
Infectious diseases	45	18.2%
Epilepsy	27	10.97%
Total Cardiac diseases	25	10.16%
RVD Positive	10	4.0%
Diabetes mellitus	9	3.65%
Asthma	8	3.25%
Hypertension	6	2.43%
Dengue fever	3	1.2%
Typhoid	3	1.2%
Others (Renal disease and hyperbilirubinemia)	2	0.8%

Figure 9: Distribution of Medical Condition

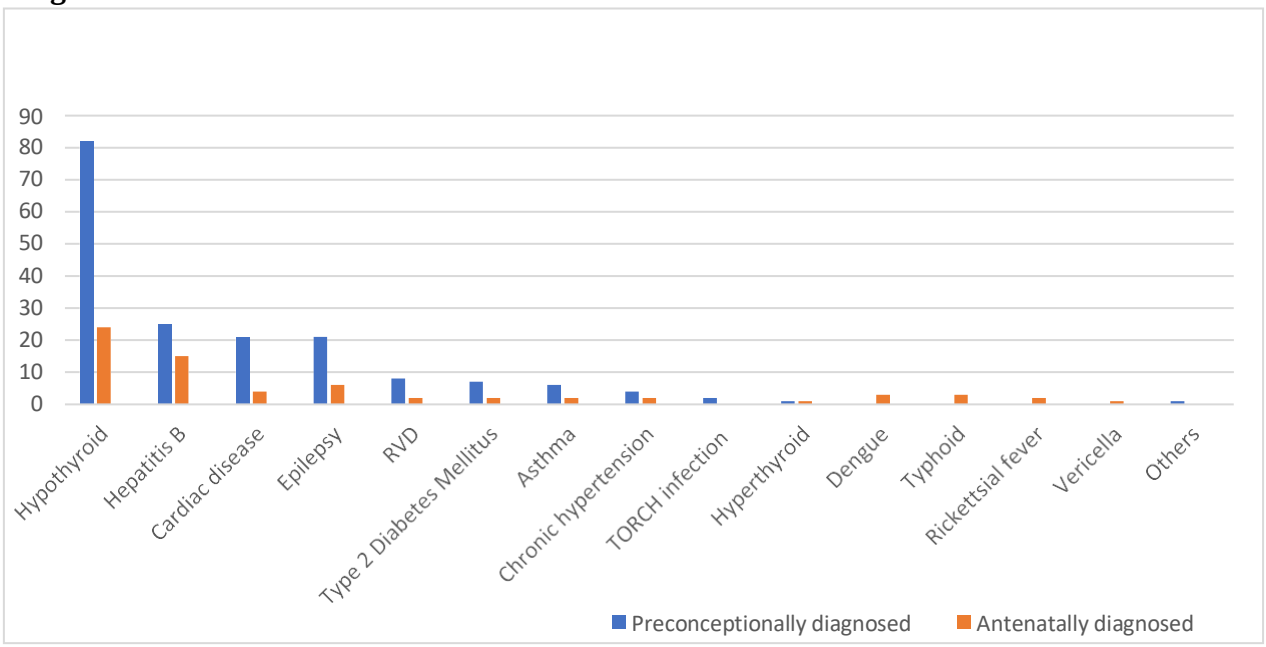


In our study the number of cases of thyroid disorders in pregnancy were 108 (43.9%), which includes hypothyroidism 106 (43.0%) and hyperthyroidism (0.8%), infectious diseases were 45 (18.2%) in which hepatitis B 40(16.2%), three (1.2%) rickettsial fever, two(0.8%) torch group of infection, one (0.4%)varicella and epilepsy were 27(10.97%), total cardiac diseases were 25 (10.16%), RVD positive were 10(4.0%), diabetes mellitus 9 (3.65%), asthma were 8 (3.25%), chronic hypertension were 6 (2.43%), dengue fever were three (1.2%), typhoid were three (1.2%) and other diseases were two (0.8%) which included renal disease(1) and hyperbilirubinemia(1). (Table 2)

Table 3: Distribution of Medical conditions among Preconceptionally diagnosed vs Diagnosed in Antenatal period

Medical conditions	**Diagnosed pre-conceptional (N=177)**		**Diagnosed in Antenatal Period (N= 69)**		**Total (N=246)**
	Frequency	Percentage	Frequency	Percentage	
Hypothyroidism	82	33.33%	24	9.7%	106
Hepatitis B	25	10.16%	15	6.09%	40
Cardiac Disease	21	8.5%	4	1.6%	25
Epilepsy	21	8.5%	6	2.4%	27
RVD	8	3.3%	2	0.8%	10
Type 2 diabetes mellitus	7	2.8%	2	0.8%	9
Bronchial Asthma	6	2.4%	2	0.8%	8
Hypertension	4	1.6%	2	0.8%	6
TORCH Infection	2	0.8%	0	0	2
Hyperthyroidism	1	0.4%	1	0.4%	2
others	1	0.4%	1	0.4%	2
Dengue	0	0	3	1.21%	3
Typhoid fever	0	0	3	1.21%	3
Varicella Zoster	0	0	1	0.4%	1
Rickettsial fever	0	0	3	1.21%	2

Figure 10: Distribution of medical condition among Preconceptionally diagnosed vs Diagnosed



In Preconceptionally diagnosed, 82 (33.33%) patients had hypothyroidism, 25 (10.16%) patients had hepatitis B, 21 (8.5%) patients had cardiac Disease, 21 (8.5%) patients had epilepsy, 8 (3.3%) patients had RVD, 7 (2.8%) patients had Type 2 diabetes mellitus, 6 (2.4%) patients had bronchial Asthma, 4 (1.6%) patients had chronic hypertension, 2 (0.8%) patients had TORCH Infection, 1 (0.4%) patient had hyperthyroidism and 1 (0.4%) patients had renal disease

Patients diagnosed with medical condition during Antenatal Period, 24 (9.7%) patients were diagnosed with hypothyroidism, 15 (6.09%) patients were diagnosed with hepatitis B, 4 (8.5%) patients were diagnosed with cardiac disease, 6 (2.4%) patients were diagnosed with epilepsy, 2 (0.8%) patients were diagnosed with RVD, 2 (0.8%) patients were diagnosed with Type 2 diabetes mellitus, 2 (0.8%) patients were diagnosed with bronchial Asthma, 2 (0.8%) patients were dengue was diagnosed in three patients (1.2%). Three (1.21%) patients were diagnosed with typhoid fever, two (0.8%) with rickettsial fever, one (0.4%) with varicella Zoster, and one (0.4%) with hyperbilirubinemia.

Association of medical condition with preconceptionally diagnosed and diagnosed during antenatal period was statistically significant (p=0.002). (Table 3)

Table 3A - Distribution of Cardiac diseases

Cardiac disease	Total no. (N=25)	Percentage (%)
Rheumatic heart disease	9	36%
ASD	5	20%
RHD with Mitral Valve Prolapse	4	16%
RHD with Mitral Valve Stenosis	2	8%
VSD	2	8%
Ebstein Anomaly	2	8%
Aortic Regurgitation	1	4%

Among the cardiac disorders 9 (36%) were rheumatic heart disease, RHD with valve involvement were six (24%), in which mitral valve prolapse were four (16%) and mitral valve stenosis were two (8%), congenital anomaly were nine (36%) in which atrial septal defect were five (20%), ventricular septal defect were two (8%) & ebstein Anomaly were two (8%) and one with aortic regurgitation (4%). (Table 3A)

Figure 11: Distribution of Cardiac Diseases

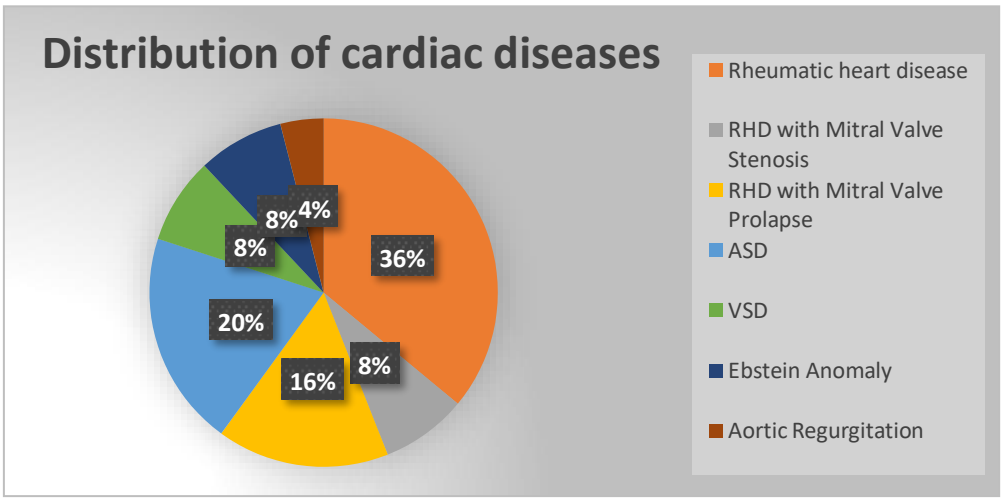
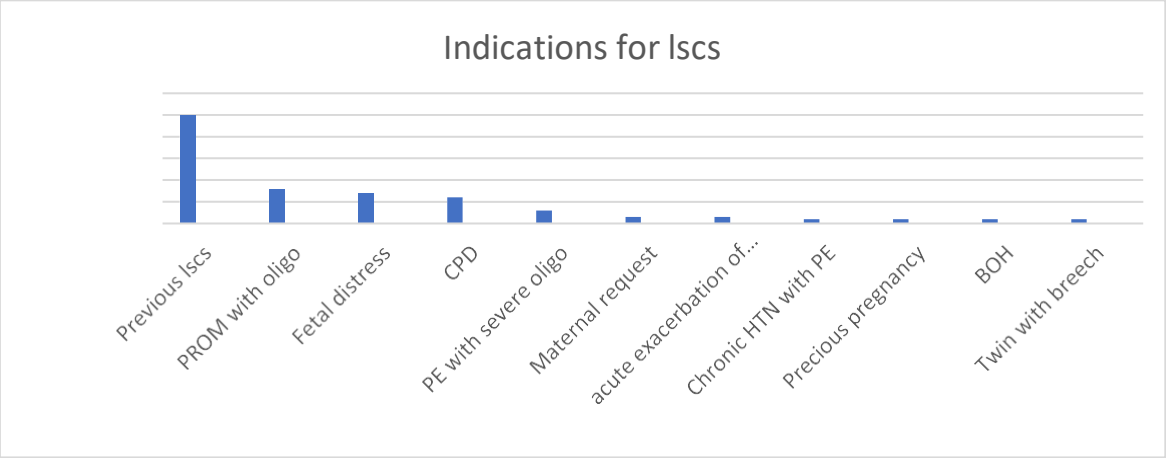


Table 4: Distribution of the mode of delivery

Mode of delivery	Term	Preterm	TOTAL (percentage)
Vaginal delivery	100	17	117 (48.0%)
LSCS	103	25	128 (52.0%)
TOTAL	204	42	245

Out of 245 deliveries 204 deliveries were term and 42 were preterm in which 117 (48%) patients delivered vaginally and 128 (52%) patients delivered through LSCS. Among the vaginal deliveries, 100 were term deliveries and 17 were preterm deliveries and among the LSCS, 103 were term and 25 were preterm. (Table 4)

Figure 12: Indication for LSCS



Among the 128 LSCS cases, 56 (43.7%) were indicated due to previous LSCS, , 18 (14.0%) due to fetal distress, 16(12.5%) due to PROM with severe oligohydraminos, 12 (9.3%) due to CPD, 6 (4.6%)due to severe oligo, 6 (4.6%) due to PE with severe oligohydraminos, 3 (2.3%) due to maternal request, 3 due to acute axacerbation of asthma 3 (2.3%), 2(1.5%) due to chronic hypertension with superimposed PE, 2(1.5%) due to previous pregnancy, 2(1.5%) due to Bad obstetric history with incontrolled diabetes and 2(1.5%) due to twin gestation with breech first twin.(Figure 12)

Table 5: Distribution of the Medical Conditions and the Maternal Outcome

Medical conditions	**Total (N=246)**	**ICU Admission**	**Improved & Discharged (N=245)**	**Death (N= 1)** (Due to pulmonary embolism)	**Intrapartum Complication** (Peripartum hysterectomy) **(N=2)**
Hypothyroidism	106	2	106	0	0
Infectious diseases	45	0	45	0	1
Epilepsy	27	0	27	0	0
Cardiac Disease	25	5	25	0	0
RVD positive	10	0	10	0	0
Type 2 diabetes mellitus	9	0	9	0	0
Bronchial Asthma	8	3	7	1	0
Hypertension	6	1	6	0	0
Dengue	3	1	3	0	1
Typhoid	3	0	3	0	0
Others	2	0	2	0	0
Hyperthyroidism	2	0	2	0	0

Among 246 cases, 12 were admitted in ICU. Out of 12 cases, 5(41.6%) had cardiac diseases, 3(25%) with bronchial asthma, 2 (16.6%) with hypothyroidism, one each with chronic hypertension(8.3%) and dengue fever(8.3%). And 2 patients had intrapartum complications and ended up in peripartum hysterectomy.There was one maternal mortality of patient with bronchial asthma.(Table 5)

Table 5A: Medical Conditions and Mother ICU Admissions

Medical conditions	Total (N=246)	Yes (N=12)	Indication
Hypothyroidism	106	2	Severe anaemia and antepartum eclampsia
Cardiac Disease	25	5	Moderate Pulmonary artery hypertension with pulmonary edema. And Postpartum monitoring
Bronchial Asthma	8	3	Acute exacerbation of asthma
Hypertension	6	1	Chronic hypertension with superimposed PE With pulmonary edema
Dengue	3	1	Dengue fever with thrombocytopenia, with hypovolemic shock with peri partum hysterectomy due to atonic PPH

Out of 246 subjects 12 (4.8%) patient had ICU admission, with ICU stay of average duration 5 to 6 days. Cause for ICU care was Is explained in the table above (Table 5A) and out of 246 patients enrolled in the study the associated risk factors were severe anemia, antepartum eclampsia and PPH(Table 5A)

Table 5B - Maternal mortality	
Total no. maternal death during study period	**18**
Maternal death associated with maternal condition	**01**

During study period total number of meternal deaths were18, among one (5.5%) was in the study cases which was known case of asthma. And death was due to cardiopulmonary arrest secondary to pulmonary embolism.(Table 5B)

Table 6 -Distribution of Medical Condition and Neonatal Outcome

Medical conditions	Total (N=246)	Live (N=239)	IUD (N=9)	NICU admission (N=57)	Perinatal death (N=3)	Improved
Hypothyroidism	106	107(twin1)	1	18	1(septic shock)	106
Hepatitis B	40	38	1	3	1(pulmonary hemorrhage)	38
Epilepsy	27	28(twin-1)	0	12(1-twin)	0	28
Cardiac Disease	25	24	1	6	0	24
RVD	10	10	0	3	0	10
Type 2 diabetes mellitus	9	6	3	3	1(severe RDS)	5
Others	9	9	0	4	0	9
Bronchial Asthma	8	5	3	2	0	5
Hypertension	6	6	0	3	0	6
Dengue	3	3	0	2	0	3
Hyperthyroidism	2	2	0	1	0	2

Total number of IUD in our study cases were 9. They were notice in cases with bronchial asthma, type 2 DM, cardiac diseases, hepatitis B, hypothyroidism.Total number of nicu admissions were among study cases were 57 and among them there were 3 perinatal death and the underlying cause were septic shock, pulmonary hemoarrhage and severe RDS.(Table 6)

Table 7 A: Distribution of the Fetal Outcome

Fetal outcome	Frequency (N=247)	Percentage (%)
IUD	9	3.65%
Alive	239 (2 twins)	95.1%
Preterm	42	17.0%
Term	203	82.5%
NICU Admission	57	22.8%
Perinatal death	3	1.2%

Among the 247 neonates, 238 (95.1%) were live birth including two twins in which 203(82.5%) were term deliveries and 42 (17.0%) were preterm deliveries and 57 (22.8%) neonates had NICU admission. There were 9 (3.65%) IUDs and 3(1.2%) perinatal deaths.(Table 7)

Figure 13: Fetal Outcome

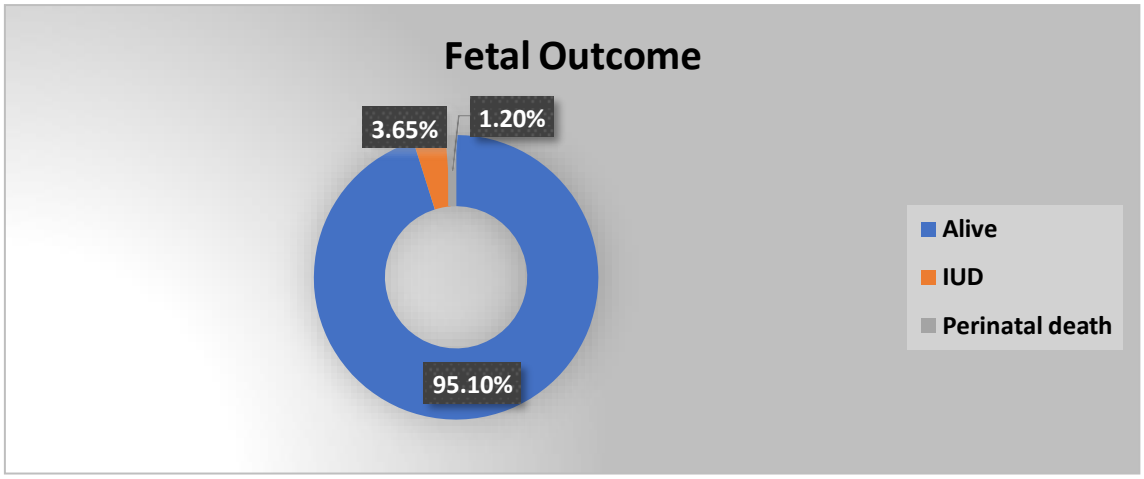


Table 7B- Medical condition and perinatal death

Maternal medical condition and Perinatal death	
Total no. of perinatal death during study period	**10**
No. of perinatal death with maternal medical condition	**03**

Among the 3 (30%) perinatal deaths with maternal medical conditions, with the maternal Hepatitis B the cause of death was pulmonary haemorrhage with 900gms birth weight and preterm delivery being the associated risk factor with POG at the time of delivery being 29 weeks, with maternal hypothyroidism the cause of death was severe RDS with 1100gms birth weight and preterm delivery and severe oligohydraminous being the associated risk factors with POG at the time of delivery being 32 weeks and with Type 2 maternal diabetes mellitus the cause of death was septic shock with 900gms birth weight and preterm delivery being the associated risk factor with POG at the time of delivery being 28 weeks. (Table 7B)

Table 8 : Medical condition complicating pregnancy

Medical Condition (total number)	Medical condition complicating pregnancy	Associated maternal complication (no. of cases)	Foetal complication (no. of cases)
Bronchial Asthma (8)	5(62.5%)	severe anemia (1) PIH (2)	preterm delivery (2) IUD (3) Low birth weight baby (1)
Epilepsy (27)	2(7.4%)	-	preterm deliveries (2)
Chronic Hypertension (6)	4(66.6%)	2 super imposed PE	preterm deliveries with FGR (3) IUD (1)
Cardiac diseases (25)	8 (32.2%)	-	preterm deliveries (5) LBW (3) IUD (1)
Hypothyroidism (106)	25(23.1%)	3 Severe anemia 12 PIH	Preterm deliveries (18) IUD (1) Perinatal death (1) (Septic shock)
Type 2 diabetes mellitus (9)	6(66.6%)	2 bad obstertrics 3 PIH	preterm deliveries (3) IUD (3) perinatal death (1) (severe RDS)
RVD (10)	2(20%)	-	preterm deliveries (2)
Dengue (3)	2(66.6%)	2 dengue fever with thrombocytopenia and 1peripartum hysterectomy (atonic PPH)	preterm delivery (2)
Infectious disease (46) Hepatitis B (40) Toxoplasma (1)	6(13.0%)	 1peripartum hysterectomy (atonic PPH)	preterm deliveries (4) peri partum death (1) (pulmonary hemorrhage) Preterm delivery with previous history of mental retarted baby (1)

Medical disorder complicating pregnancy have been explained above.(Table 8)

Table 9: Pregnancy complicating Medical Disorders

Medical Condition (Total number)	Pregnancy complicating medical disease no.	Complications (no. of cases)		No. of ICU admission	improved
		Exacerbation of existing medical condition(no.)	Unmasking the medical condition(no.)		
Bronchial Asthma (8)	5(52.5%)	Acute exacerbation of asthma		3	4
		Preconceptionally diagnosed of asthma with pulmonary oedema (3)	Antenatally first time with asthma (2)		
Cardiac Disease (25)	08(32.0%)	preconceptionally diagnosed presented with breathlessness (NYHA class 3) or palpitation (4)	first time presented with murmurs antenatally (4)	5	10
Epilepsy (27)	9(33.3%)	Convulsion Episode		0	9
		preconceptionally diagnosed (3)	1st time in 1st trimester (6)		
Hypertension (6)	4(66.66%)	Uncontrolled hypertension		1	4
		Preconceptionally diagnosed with (2)	Newly diagnosed antenatally (2)		
Hypothyroidism (108)	29(26.8%)	preconceptionally diagnosed with TSH > 10 (5)	New cases with TSH > 10 (24)	2	2
Type 2 diabetes (9) mellitus	7(77.77%)	Uncontrolled diabetes hba1c >6.5 (5)		0	7
		Preconceptionally diagnosed (5)	New cases (2)		

pregnancy complicating medical disorder have been above. (Table 9)

DISCUSSION

The present study was a prospective observational study. This Study was conducted from January 2021 to 31st April 2022 in the Department of B.L.D.E (DEEMED TO BE UNIVERSITY) SHRI B.M. PATIL Medical College Hospital and Research Centre. Total 246 patients were included in this study which was 10% of total admission during study period.

Study conducted on medical disorder in pregnancy conducted by **Sushila Chaudhary et al[58] and Sushruta Shrivastava et al[2]**, majority of the mothers were in the mean age group 25.08±2. and more than 50% women presented at 37 weeks or above and study cases were belonging to maximum rural area by 53%.

Similarly in our study of the pregnancy with medical diseases, the mean age group was 26 ± 4.58 years and more than 50% women presented at 37 weeks or above. Mostly Belongs to rural area (65.9%). But in case of type 2 diabetes out of 9 cases 5 cases were from urban which was about 55.5%, due to urbanisation, sedentary life style, unhealthy diet and late marriages (>30 years), this was Supported by another study conducted by **Lt gen SR mehta et al[81]**.

In our study showed that, most common medical condition was hypothyroidism [106(43.9%)] which was statistically significant (p< .00001) (Z=11.1817). complications associated with hypothyroidism in our study is compared with various study as shown in the table below (Table 10)

Table 10-Feto maternal outcome in women with hypothyroidism

Complication	PIH	Preterm delivery	IUD
In this study	11.3%	16.9%	0.9%
Alemu A et al[45]	-	20%	-
Sarladevi et al[48]	9.3%	7.8%	1.56%
Sahu MT et al[66]	9.8%	10.3%	2.5%
Ajmani et al[67]	22.3%	5.8%	1.7%

It is found that thyroid dysfunctions such as hypothyroidism, thyrotoxicosis and thyroid nodules may develop during pregnancy leading to abortion, placental abruptions, preeclampsia, preterm delivery and reduced intellectual function in the offspring.

Table 11-Seroprevalence of HBsAg positivity among antenatal female in different studies

Study	Year	Location	Sample size	Prevalence rate
In our study	2021	Bijapur	246	16.2%
Bakthavachalu et al[68]	2012	Bangalore	500	7.8%
Paranjothi et al[69]	2009	Krishnagiri	762	5.1%

Prevalence of hepatitis varies across India. In our study prevalence rate is significant due to increased screening of pregnant woman during antenatal period.

Hepatitis B infection has no increased risk of fetal malformation but perinatal mortality is increased due to higher rate of prematurity and stillbirth. In our study preterm delivery among HBsAg positive were 10% in comparison the with study conducted by **Reddikh et al[86]** where preterm delivery was 21% among 850 cases. and another study by **Ka yu Tse et al[70]** all, preterm deliveries were 4.7% which was significant as compared with HBsAg negative control cases.

Epilepsy in pregnancy, study conducted by **Roopa malik et al[64]** included 55 patient with epilepsy in which 8 were newly diagnosed and among eight Antiepileptic cases, three in second

and five in third trimester medically managed and continued with pregnancy had no maternal and foetal complications. similarly in our study six out 27 cases were diagnosed epilepsy antenatally four were second trimester and three in third trimester and were managed medically. Pregnancy was continued with no maternal or foetal adverse effect. And among known cases of 21, 2 cases had episode of convulsion in 3rd trimester and had preterm delivery and 1 patient had convulsion in postpartum period managed medically required antiepileptic dose was escalated to remain seizure free.

Another study conducted by **Raji C et al[63]** included 110 epilepsy cases and they have observed that there was no significant increase in the risk of pregnancy or delivery complications. In most cases, pregnancy and childbirth pose no undue risks. similar observations were seen in our study. In the same study out of 110 cases 12 cases had preterm delivery which was 11.4%, where as in our study two patients out of 27 had preterm delivery which accounts for 7.4 %.

Out of 25 pregnant women with cardiac diseases, RHD (60%) was the commonest cardiac diseases and followed by ASD (20%) in congenital heart disease. Increased trend in congenital diseases in comparison with other studies, primarily due to the increased number of women with congenital heart disease reaching childbearing age by early diagnosis and prompt treatment at early age.

Table 12 -Incidences of cardiac disorders in pregnancy in various in comparison our study

Studies	Total no.	RHD(%)	Congenital heart diseases
In our study	25	15 (60%)	10 (40%)
Murali subbaiah et al[87]	100	64 (64%)	36 (36%)
Saima salam et al[88]	90	51(56.6 %)	13.3 (12)
Tanvi Kumar et al[89]	42	24 (57.14%)	12 (28.57%)

Table 13- Fetal outcome in cardiac diseases in comparison with other studies

Studies	Total no.	Preterm delivery	Low birth weight	IUD
In our study	25	5(20.0%)	3 (12%)	1(4.0%)
Verena Stangl et al[90]	93	22 (22.0%)	14 (16.7%)	1(1.1%)
Murali subbaiah et al[87]	100	26 (26%)	42(42%)	2 (2%)

Complications of cardiac diseases during pregnancy study conducted by **Murali subbaiah et al[87]**, 25 out of 100 developed functional deterioration which was 25%, 4 cases developed pulmonary edema which is 4%. In our study 6 patients developed functional deterioration (24%) and 4 patient developed pulmonary edema (16%).

Cardiac diseases in our study had significant maternal and fetal morbidity with comparison to other studies. Due to increased morbidity and mortality rate in cardiac diseases, the pregnancy should start with pre-conception counseling that outlines the maternal and fetal complications associated with her particular cardiac disorder.

Table 14- Feto-maternal complications in bronchial asthmatics in comparison with other studies

Study	Acute exacerbation of asthma	Associated PIH	Preterm term	LBW
In our study	66%	25%	25%	12.5%
by Ram Hari et all[73]	48.17%	10.18%	-	-
Schaz M et al[74]	46%	-	-	-
Babu Lal Meena[75]	-	20%	13%	7.7%

Asthma was associated with high maternal and fetal morbidity and mortality rate which is also supported by review study conducted by **Z Ali et al[62]**.

Study conducted by **Jenny E Gunton[76]** where Pregnant women with type 2 diabetes were 12, 36% developed PIH and preterm deliveries were 27.3% and IUD were 5.3% and in our study 33.3% associated PIH and 33.3% were preterm deliveries, 33.3% were associated with IUD. In our diabetic pregnant women had increased fetal morbidity and mortality and perinatal mortality.

Study conducted by **S Banarjee et al[77]** where perinatal death was 4.16%, where as in our study perinatal death in type 2 diabetic women were 10%.

Anil Kapur et al[65] states that previously unknown type 2 diabetes mellitus (DM), is a common medical condition during pregnancy, necessitating universal screening for all pregnant women, including first trimester screening.

Pregnancy-induced metabolic changes in women with type 2 diabetes necessitate closer treatment titration to ensure glycemic control is optimised early in pregnancy to reduce the risk of foetal hyperinsulinemia.

Women with type 2 diabetes have the same rates of major congenital malformations, stillbirth, and neonatal mortality as women with type 1 diabetes, but they are at a higher risk of perinatal mortality.

Study conducted by **Chaitra S, et al**[79] showed 2.7 were chronic hypertension cases, 0.34 % were preeclampsia superimposed on chronic hypertension, where as another study by **Roberts et al**[80], showed 0.6 % were chronic HTN and 0.3% women had preeclampsia superimposed on chronic hypertension. In our study 2.7% were chronic hypertension 0.8% were preeclampsia superimposed on chronic hypertension.

Study conducted **Baha M. Sibai,et al**[81] preterm deliveries by 33% in our study preterm deliveries were 50% which Was also supported by study conducted by **Chun ye et al**[82] where 52% were preterm delivery. In our study pregnant women with chronic hypertension also showed 50% FGR and 12.5% IUD.

Medical condition complicating pragnancies, most commonly due to hypertensive disorders by 66.6%, type 2 diabetes mellitus by 66.6%, dengue by 66.6%, asthma by 62.1%, thyroid disorders by 23.1% and infectious diseases by 13.0%. in this study more than 50% of hypertensive disorders and type 2 diabetes, asthma and dengue fever have maternal and fetal adverse outcome. (Table 8)

Studies of medical disorder in pregnancy conducted by **Sushila Chaudhary et al**[58] and **Baral G et al**[51] concluded that hypertensive disorder were commonest medical disorder during pregnancy increasing maternal moratlity and morbidity.

Study conducted by **Neelakandan Ramya**[83] dengue in pregnancy, out 16 cases 56% had preterm delivery and 31% had thrombocytopenia and in our study 66.6 % had preterm delivery with thrombocytopenia and intra partum complication.

Study conducted by **Milind Chandurkar** showed that, Among various infective diseases, Malaria, Viral Fever and Dengue fever were most common diseases causing maternal morbidity.

Pregnancy complicating medical disorder by unmasking the medical condition or exacerbating the exist medical condition. Pregnancy complicating diabetes by 77.7%, chronic hypertension by 66.6%, asthma by 52.5%, cardiac condition by 32% and epilepsy by 33.3%. (Table 9)

Pregnancy complicating medical disorder is statistically significant than medical condition complicating pregnancy. Hence pregnancy is avoided in some medical disorders. And preconception diagnosis and prompt treatment of medical disorder is important in improving maternal and fetal outcome.

SUMMARY

- In our study, most of the patients were 18-25 years of age which was statistically significant.
- Our study showed that, higher number of patients had Multigravida which was statistically significant.
- We showed that, most of the patients were >37 weeks of Gestation which was statistically significant.
- Our study showed that, most of the patients had Thyroid abnormality which was statistically significant. Followed by infectious disease.
- Medical conditions were associated with increased maternal and fetal mortality and morbidity with increased incidence of maternal associated complications such as preeclampsia and eclampsia, severe anemia, pulmonary edema and also by exacerbation of existing medical disorders. And adverse fetal outcome were preterm deliveries, low birth weight, FGR, neonatal sepsis, sudden intra uterine death and perinatal death.
- Pregnancy complicating diseases were more significant than disease complicating pregnancy.

CONCLUSION

Medical disorders in pregnancy are multifactorial and present with great potential of adversity affecting the maternal and foetal outcome. The maternal mortality and morbidity resulting from treatable medical conditions has not decreased in spite of decrease in overall mortality. These conditions need early detection, prompt initiation of treatment and regular follow up to decrease the effect on mother and the fetus. Management of these patients including pre-conceptional counselling, prompt recognition of acute illness and optimal treatment of chronic condition is of clear benefit and most of the drugs and even radiological investigations in this modern era can be used during pregnancy.

In our study even though the pregnancy complicating medical conditions were more significant than medical conditions complicating the pregnancy, the effect of medical conditions whether diagnosed pre-conceptionally or antenatally did not have much impact on feto-maternal outcome unless they were well controlled. The commonest medical conditions were hypothyroidism and other endocrine disorders.

Education of the patients regarding the awareness of the danger signs and their seeking for help from the medical facilities available in time will help in improving the feto-maternal outcome. Therefore, management of pregnancy requires multidisciplinary approach and interventions as and when needed for better outcome.

LIMITATIONS OF THE STUDY

In spite of every sincere effort my study has lacunae.

The notable short comings of this study are:

1. The sample size was small. Only 246 cases are not sufficient for this kind of study.
2. The study has been done in a single centre.
3. The study was carried out in a tertiary care hospital, so hospital bias cannot be ruled out

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IEC/00-09/2021
Date: 22/01/2021

B.L.D.E. (DEEMED TO BE UNIVERSITY)

(Declared vide notification No. F.9-37/2007-U.3 (A) Dated. 29-2-2008 of the MHRD, Government of India under Section 3 of the UGC Act, 1956)

The Constituent College

SHRI. B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The Institutional ethical committee of this college met on 11-01-2021 at 11-00 am to scrutinize the synopsis of Postgraduate students of this college from Ethical Clearance point of view. After scrutiny the following original/corrected and revised version synopsis of the Thesis has been accorded Ethical Clearance

Title: Pregnancy with medical disorders: A prospective clinical study at a tertiary care hospital

Name of PG student: DrMonika Kanni, Department of Obst/Gynaec

Name of Guide/Co-investigator: Dr Aruna.M.Biradar, Associate Professor of Obst/Gynaec

DR .S.V.PATIL
CHAIRMAN, IEC

Institutional Ethical Committee
B L D E (Deemed to be University)
Shri B.M. Patil Medical College,
VIJAYAPUR-586103 (Karnataka)

Following documents were placed before Ethical Committee for Scrutinization:

1. Copy of Synopsis / Research project
2. Copy of informed consent form
3. Any other relevant documents.

12

CONSENT FORM

B.L.D.E. (DEEMED TO BE UNIVERSITY) SHRI B.M.PATIL MEDICAL COLLEGE

HOSPITAL AND RESEARCH CENTER, VIJAYAPURA-586103

INFORMED CONSENT FOR PARTICIPATION IN DISSERTATION/RESEARCH

I, the undersigned, _____ D/O W/O _____, aged ____years, ordinarily resident of _____ do hereby state/declare that Dr MONIKA KANNI of Shri. B. M. Patil Medical College Hospital and Research Centre has examined me thoroughly on _____ at _____ (place) and it has been explained to me in my own language that I am suffering from _____ disease (condition) and this disease/condition mimic following diseases. Further Dr MONIKA KANNI informed me that she is conducting dissertation/research titled "**Pregnancy With Medical Disorders: A Prospective Clinical Study At A Tertiary Care Hospital**" under the guidance of Dr ARUNA BIRADAR requesting my participation in the study. Apart from routine treatment procedure, the pre-operative, operative, post-operative and follow-up observations will be utilized for the study as reference data. The doctor has also informed me that during the conduct of this procedure like adverse results may be encountered. Among the above complications, most of them are treatable but are not anticipated hence there is chance of aggravation of my condition and in rare circumstances, it may prove fatal despite the anticipated diagnosis and best treatment made available. Further Doctor has informed me that my participation in this study would help in the evaluation of the results of the study which is a useful reference to the treatment of other similar cases in near future, and also I may be benefited in getting relieved of suffering or cure of the disease I am suffering.

The Doctor has also informed me that information given by me, observations made photographs video graphs taken upon me by the investigator will be kept secret and not assessed by the person other than me or my legal hirer except for academic purposes. The Doctor did inform me that though my participation is purely voluntary, based on information given by me, I can ask any clarification during treatment/study related to diagnosis, the procedure of treatment, result of treatment or prognosis. At the same time I have been informed that I can withdraw from my participation in this study at any time if I want or the investigator can terminate me from the study at any time from the study but not the procedure of treatment and follow-up unless I request to be discharged. After understanding the nature of dissertation or research, diagnosis made, mode of treatment, I the undersigned Smt _____ under my full conscious state of mind agree to participate in the said research/dissertation.

Signature of patient: Signature of doctor:

PROFORMa

Pregnancy with Medical Disorders

A Retrospective Clinical Study at a Tertiary Care Hospital

NAME:
AGE:
INPATIENT NUMBER (IP No.):
DATE OF ADMISSION:
ADDRESS AND PHONE NUMBER :

DEMOGRAPHY: RURAL URBAN

CHIEF COMPLAINTS:

HISTORY OF PRESENT ILLNESS:

HISTORY OF PRESENT PREGNANCY:

FIRST TRIMESTER:

SECOND TRIMESTER:

THIRD TRIMESTER:

MARITAL HISTORY:

OBSTETRIC HISTORY: G P L A D

LMP:

EDD:

POG:

MEDICAL HISTORY:

DIAGNOSIS: 1

2

PRENATAL ANTENATAL

TREATMENT HISTORY:

DURATION:

ANY PROCEDURE:

DISEASE COMPLICATING PREGNANCY:

PREGNANCY DETERIORATING MEDICAL DISORDER:

PERSONAL HISTORY:

GENERAL PHYSICAL EXAMINATION:

PULSE: BLOOD PRESSURE: RESPIRATORY RATE:

TEMPERATURE:

HEIGHT: WEIGHT:

PALLOR:

ICTERUS:

CYNOSIS:

SPINE:

CLUBBING:

RELAXT:

LYMPHADENOPATHY:

EDEMA:

CARDIOVASCULAR SYSTEM:

RESPIRATORY SYSTEM:

PER ABDOMEN:

PRESENTATION:

INVESTIGATIONS:

PT-INR:

LFT:

RFT:

HIV:

Thyroid Profile: T3: T4: TSH:

USG:

ECHO:

CT-SCAN:

MRI:

MODE OF DELIVERY:

VAGINAL DELIVERY - PRETERM FULL TERM

EMERGENCY PRETERM FULL TERM

ELECTIVE - PRETERM FULLTERM

INDICATION:

DATE OF DELIVERY:

FOETAL OUTCOME:

SEX:

BIRTH WEIGHT:

APGAR SCORE: 1min: 5min:

NICU ADMISSION: YES

NO

IF YES-

INDICATION

DURATION OF STAY –

DATE OF DISCHARGE

MATERNAL OUTCOME:

ICU ADMISSION: YES OR NO

IF YES -DURATION

VENTILATOR SUPPORT: YES OR NO

IF YES – DURATION

INOTROPIC SUPPORT: YES OR NO

IF YES- DRUGS USED – DURATION

DURATION OF HOSPITAL STAY –

DATE OF DISCHARGE –

REMARKS-

IMPROVED / DEATH / DISCHARGE AGAINST MEDICAL ADVICE

IF DEATH- CAUSE OF DEATH