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A Review on Facts about Preeclampsia.

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ABSTRACT

Preeclampsia is a pregnancy complication characterized by high blood pressure post toweek twentieth of pregnancy, along with, proteinuria in urine samples and edema of the body. High blood pressure is one of the most common pregnancy crisis. In addition, how pregnancy causes severe high blood pressure or even how it is triggered, are considered to be the unsolved glitches in medicine. In most cases this ailment's onset is in pursuit of week 37 of gestational age, although, it may be seen at any time from the second half of pregnancy, during labor, and or after delivery (usually it becomes discrete in the first 24 to 48 hours after delivery). The occurrence of this phenomenon before week 20 of pregnancy is possible in rare cases of molar pregnancy. Most women with preeclampsia never experience or show signs other than mild to elevated blood pressures, and small excretions of protein in the urine. Maternal and neonatal consequences in patients with preeclampsia depends on the following factors : Mother's age at the time of delivery, disease severity, quality of care and treatment and other illness history, further more disseminated intravascular coagulation, intracranial bleeding, renal failure, retinal detachment, pulmonary edema, liver rupture, placental detachment, preterm labor, fetal distress and death might pursue preeclampsia. By average elevated blood pressures about more than a few weeks or months is usually not destructive. Harmful risks such as brain stroke, and heart attack are not usually common in chronic hypertension. Urinary protein loss due to preeclampsia is a sign of kidney injury. In women experiencing mild preeclampsia, the baby's overall health is generally good.

Keywords: Preeclampsia, eclampsia, Pregnancy, Complications, Etiology, Review article

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INTRODUCTION

Preeclampsia is a pregnancy complication characterized by high blood pressure post toweek twentieth of pregnancy, along with, proteinuria in urine samples and edema of the body.

High blood pressure is one of the most common pregnancy crisis. In addition, how pregnancy causes severe high blood pressure or even how it is triggered, are considered to be the unsolved glitches in medicine [1-3].

Four types of hypertension are definable in pregnancy, as far as the severity of symptoms, and their incidence of complications varies [4-6].

1. Pregnancy hypertension: is the increase in blood pressure in pregnancy.
2. preeclampsia
3. Seizures (eclampsia)
4. Preeclampsia in an individual who already has had chronic hypertension.

In most cases this ailment's onset is in pursuit of week 37 of gestational age, although, it may be seen at any time from the second half of pregnancy, during labor, and or after delivery (usually it becomes discrete in the first 24 to 48 hours after delivery). The occurrence of this phenomenon before week 20 of pregnancy is possible in rare cases of molar pregnancy. Preeclampsia could range from mild to severe, and its progress could be slow or rapid. The mere cure for patient recovery, is delivery. However, if such fore mentioned situation is combined with seizures in a pregnant mother, then it will be termed eclampsia [7-9].

High blood pressure is detected only if the blood pressure is above 140/90. Gestational hypertension or pregnancy hypertension, is increasing blood pressure over 140/90, which disappears up to 12 weeks after termination of pregnancy, without proteinuria symptoms, or other complications [10].

Preeclampsia

The onset is subsequent to week 20, gestational age, which, in turn is marked by weight gain of over one Kgs per week and protein excretion of over 300 mgs in 24 hours. Upper limb and face edema exacerbates. It has moderate to severe forms. Different resonant modes have various treatments. If neurological signs and seizures are seen along with pre-eclampsia symptoms, then, eclampsia diagnosis could be relevant [11, 12].
If raised blood pressure without symptoms begins before pregnancy, it is classified as chronic hypertension.

Signs and symptoms of preeclampsia:

Signs and symptoms of preeclampsia, is due to increased pressure within the small arteries, which in turn reduce blood flow to major organs such as the kidney, placenta, brain, and liver.

1. It is more common in young first time moms
2. In women over 35 years old. (Especially if pregnancy is the outcome of reproductive technology).
3. Individuals who have chronic vascular disease.
4. Patients who are genetically susceptible to preeclampsia during pregnancy.
5. In multiple simultaneous births or existence of hydatidiform moles, preeclampsia may occur even before week 20 of gestational age.
6. Incompatible blood Rh Factor
7. Obesity is an important risk factor.
8. Insulin Resistance
9. Maternal infection
10. Low socioeconomical status
11. African-American race

12. Polyhydramnios

Symptoms

1. Systolic blood pressure above 140 mmHg or diastolic blood pressure above 90 mmHg/kg
2. Unexpected and sudden weight gain for more than 5 weeks
3. proteinuria
4. Headaches and visual impairments
5. Heartburn
6. swollen limbs
7. dyspnea
8. Nausea and vomiting
9. Change in level of conscious
10. Oliguria

Symptoms in the mother

Most women with preeclampsia never experience or show signs other than mild to elevated blood pressures, and small excretions of protein in the urine. These changes often have no symptoms, therefore, before the baby is born, routine blood pressure and urine protein tracings should be frequently performed in the second half of pregnancy.

Swelling of the body (edema) should be considered as a sign of pre-eclampsia, especially when it occurs in the hands and face. However, since edema is not visible in the majority of women with pre-eclampsia, therefore edema cannot be considered a consistent and reliable sign of pre-eclampsia.

Signs of severe preeclampsia

Mild preeclampsia could exacerbate and worsen. This circumstance often occurs within a few days to few weeks, however, it may occur more rapidly. Severe preeclampsia may be associated with one or more of the below symptoms. In spite that, the distinction among mild and severe pre-eclampsia might be a challenge. It is to note that any doubt about affected patients and their disease symptoms, whom had no prior visit to the proper physician forestalls the appropriate and essential diagnoses and treatment.

- Blood pressures above 160/110 mm Hg in women with hypertension, increases the risk of brain stroke.
- Severe long lasting headaches
- Visual Complications (blurred or double vision, blind spots, seeing flashing lights or moving, twisting and turning lines, loss of vision)
- Abnormal kidney tests or oliguria (less than 500 mL of urine in 24 hours)
- Accumulation of fluid in the lungs, and shortness of breath
- Low number of platelets, and clotting problems, which may cause bruises or bleeding
- Liver impairment (detected via laboratory blood tests); Symptoms are nausea, vomiting, or pain in the middle or in the upper right area of the abdomen (similar to heartburn)
- Destruction of red blood cells (red blood cell diminution, diagnosed via blood work).
- Full or partial separation of the placenta from the uterus (placental detachment); symptoms include vaginal bleeding, uterine pain or decreased fetal activity

Complications (Adverse effects)

Maternal and neonatal consequences in patients with preeclampsia depends on the following factors : Mother's age at the time of delivery, disease severity, quality of care and treatment and other illness history, further more disseminated intravascular coagulation, intracranial bleeding, renal failure, retinal detachment, pulmonary edema, liver rupture, placental detachment, preterm labor, fetal distress and death might pursue preeclampsia.

Prevention

No known resolution exists to prevent preeclampsia, although research in this field is ongoing. Until a tactic is found to prevent this problem, the best caution is to pay regular visits for pregnancy-time support and care.

Hypertension which is due to pregnancy, in other words, hypertension that is the result of physiopathological disruptions during pregnancy is termed "Pre-eclampsia."

Treatment (The Cure)

Early detection is the most important factor in pregnancy hypertension and its group category, depends on early diagnosis as well.

Basically, prenatal checkups are every month until week 28, then every two weeks up until week 36, then after, weekly checkups are until delivery. These follow ups help us keep track of the patient's health and to give the proper diagnosis of hypertension at the first sight of disease.

One of the key interventions for treatment is bed rest. Absolute bed rest is not necessarily required. Tranquilizers and sedatives are not recommended. Calories, enough protein, fluid, and controlled salt intake (without discontinuance) have major impact. Fortunately, most cases have mild hypertension or demonstrate symptoms near the end of pregnancy. So, in addition with the best treatment being pregnancy termination, thus the timing of the appearance of the symptoms becomes vital.

Treatment of preeclampsia in pregnant women, is removing the fetus and placenta out of the mother's body (delivery). Although, mother's sufficient rest and medication intake can lower elevated blood pressures and regulate it, in addition it can reduce the risk of brain stroke. However, this kind of therapy has no positive impact in the treatment of vascular (blood vessel) disorders.

Before the full development of the infant

If severe preeclampsia, in premature infant's mother (pre-mature infant: when the fetus can survive outside the womb with medical aid) occurs, it is necessary to prevent complications in the infant and mother. If mild preeclampsia occurs before fetal maturity, delivery may be postponed until a later time to allow more time for the development of the growing fetus. Of course, meanwhile close monitoring of the mother and fetus takes place, until the fetus reaches maturity.

The type of delivery (natural or cesarean) depends on some factors such as the position of the baby in the uterine, dilation or narrowing of the opening of the cervix, and the baby's condition. In most cases, vaginal delivery is possible.

Medications

Several studies have shown that the use of permissible antihypertensive drugs in pregnancy, despite lowering blood pressure, have no effect on the duration of pregnancy, blood pressure, and birth weight. On top of

that, even a research indicates that fetal growth is reduced double in people who are taking antihypertensive medications compared to those who do not. The only exception in this case is chronic hypertension.

Steroidal medication consumption

Premature infants are at risk for lung and respiratory problems, therefore, women whom are required to do premature labor (on or before week 34 of gestation), are given two steroidal injections to accelerate fetal lung growth (e.g., medications such as Betamethasone). Steroids also, subside the risk of other prematurity complications in infants, such as brain hemorrhage. Two separate injections: 24 hours after the first injection, along with follow up of the treatment signs in fetal laboratory results. The second injection is 48 hours after the first injection.

Hospitalizing and monitoring mothers

When a mother's delivery is delayed, mother and infant should be monitored closely. Mother might be hospitalized, or may have the permission to stay home. However, continuous monitoring of the patient's condition should be evaluated repeatedly by the doctor. Caring physicians should immediately order laboratory works including blood pressure holtering, blood and urine tests for hepatic and kidney functional evaluation, and complete blood cell count for women who are cared at home, but have demonstrated severe signs of pre-eclampsia like edema or blurred vision.

Fetal monitoring

Fetal monitoring includes a combination of non-invasive fetal blood tests and ultrasound.

No stress testing is necessary to monitor the infant. Ultrasound measures infant's heart rate through a small probe on mother's abdomen. This device utilizes sound waves (ultrasound) to measure the baby's heart rate for 15 to 30 minutes. Typically, an infant's heart rate should be between 120 and 160 beats per minute. In general, heart rate escalation strikes intermittently. The pulse upsurge count is expected to be at least 15 beats per minute more than the basal pulse count and it has to last for 15 seconds, until a proper trust worthy test is taken. In the time plot of 20 minutes, heart rate rise is expected to occur twice or more in a healthy fetus. If initial test results are not sufficiently satisfactory, further testing might be essential. Ultrasound is used to monitor infant's growth, and it is also utilized to further assess fetus health, and umbilical cord blood flow, through umbilical cord (with Doppler test). To further assess physical and biological characteristics of the embryo (Biophysical profile), ultrasound assessment of the embryo is applied to evaluate the fetus's movements, respiration, movement of arms and legs, and intrauterine fluid volume.

Premature delivery

If maternal and infant testing results are undesirable, the physician might recommend prompt delivery. The most common reasons for the need for hasty delivery in women with preeclampsia are as explained below:

If the cervix opening is still diagnosed closed, certain drugs will be prescribed to directly contribute to the thinning and opening of the cervix. In many women, to stimulate the uterus, intravenous drug such as oxytocin are employed. This treatment tactic causes contractions of the uterus. If despite all these treatment tactics, natural delivery does not ensue or some complications develop, cesarean delivery will be scheduled to give the baby speedy birth.

Seizure prevention

Since pregnancy in women with preeclampsia may turn to seizures (convulsions), most patients get treated with antiepileptic drugs. The most commonly used drug to prevent seizures is intravenous magnesium sulfate in pregnant women. Dietary supplements containing Magnesium are also recommended to prevent seizures. Oral Magnesium is safe for the fetus, Even though, mothers and babies are closely monitored during

treatment, nonetheless, elevated Magnesium blood levels could be detrimental. Magnesium is given to women during labor as well, and its effects usually last for 24 hours after delivery. In circumstances of severe hypertension, one or multiple intravenous medications are prescribed to the mother to lower blood pressure, and also to diminish the risk of brain stroke.

Postpartum Care

Elevated blood pressures and proteinuria vanish within a few days after birth. Extremely high blood pressures should be treated seriously. Some women are required to persist treating their escalated blood pressures, even after when they are discharged from the hospital, this procedure can usually subordinate blood pressure to normal levels within 6 weeks.

If elevated blood pressure continues to persist for more than 12 weeks after delivery, then it is no longer related to preeclampsia, and demands long-term attention.
Women whom had experienced severe preeclampsia before the end of their pregnancy period, or experience recurrent preeclampsia, and/or gestational hypertension, are fairly highly susceptible to cardiovascular diseases later in life, including menopausal life stage.

Disease complications

By average elevated blood pressures about more than a few weeks or months is usually not destructive. Harmful risks such as brain stroke, and heart attack are not usually common in chronic hypertension. Urinary protein loss due to preeclampsia is a sign of kidney injury. In women experiencing mild preeclampsia, the baby's overall health is generally good.

Severe preeclampsia may be associated with transient abnormalities in liver and kidneys, and low platelet count (thrombocytopenia, which can be linked to bleeding).In women with severe preeclampsia, especially when effected early there are increased risks of complications from premature birth, to low birth weight.

The risk of preeclampsia in future pregnancies

Most women who have experienced preeclampsia, will not experience it again in later pregnancies. The risk of recurrent preeclampsia is between 5 to 70%.

•Women enduring severe preeclampsia before week 30 in a prior pregnancy have a greater risk of preeclampsia in subsequent pregnancies as well.
•Women with mild preeclampsia near delivery, are only 5% likely to develop preeclampsia again.

Here we quote the abstracts of literature

"Preeclampsia is a devastating cardiovascular disorder of late pregnancy, affecting 5-7% of all pregnancies and claiming the lives of 76,000 mothers and 500,000 children each year. Various lines of evidence support a "tissue rejection" type reaction toward the placenta as the primary initiating event in the development of preeclampsia, followed by a complex interplay among immune, vascular, renal, and angiogenic mechanisms that have been implicated in the pathogenesis of preeclampsia beginning around the end of the first trimester. Critically, it remains unclear what mechanism links the initiating event and these pathogenic mechanisms. We and others have now demonstrated an early and sustained increase in maternal plasma concentrations of copeptin, a protein byproduct of arginine vasopressin (AVP) synthesis and release, during preeclampsia. Further, chronic infusion of AVP during pregnancy is sufficient to phenocopy essentially all maternal and fetal symptoms of preeclampsia in mice. As various groups have demonstrated interactions between AVP and immune, renal and vascular systems in the non-pregnant state, elevations of this hormone are therefore positioned both in time (early pregnancy) and function to contribute to preeclampsia. We therefore posit that AVP represents a missing

mechanistic link between initiating events and established mid-pregnancy dysfunctions that cause preeclampsia." [13]

"Balanced immune responses are essential for the maintenance of successful pregnancy. Aberrant responses of immune system during pregnancy increase the risk of preeclampsia. Toll-like receptor 4 (TLR4) plays a crucial role in the activation of immune system at the maternal-fetal interface. This study aimed to generate a rat model of preeclampsia by lipopolysaccharide (LPS, a TLR4 agonist) administration on gestational day (GD) 5 as rats are subjected to placentation immediately after implantation between GDs 4 and 5, and to assess the contribution of TLR4 signaling to the development of preeclampsia. Single administration of 0.5 mug/kg LPS significantly increased blood pressure of pregnant rats since GD 6 (systolic blood pressure, 124.89 +/- 1.79 mmHg versus 119.02 +/- 1.80 mmHg, $P < 0.05$) and urinary protein level since GD 9 (2.02 +/- 0.29 mg versus 1.11 +/- 0.18 mg, $P < 0.01$), but barely affected blood pressure or proteinuria of virgin rats compared with those of saline-treated pregnant rats. This was accompanied with adverse pregnancy outcomes including fetal growth restriction. The expression of TLR4 and NF-kappaB p65 were both increased in the placenta but not the kidney from LPS-treated pregnant rats, with deficient trophoblast invasion and spiral artery remodeling. Furthermore, the levels of inflammatory cytokines were elevated systemically and locally in the placenta from pregnant rats treated with LPS. TLR4 signaling in the placenta was activated, to which that in the placenta of humans with preeclampsia changed similarly. In conclusion, LPS administration to pregnant rats in early pregnancy could elicit TLR4-mediated immune response at the maternal-fetal interface contributing to poor early placentation that may culminate in the preeclampsia-like syndrome." [8]

"Pregnancy in chronic kidney disease (CKD) patients is often associated with hypertension and/or the worsening of renal function and neonatal death. The present study explored the clinical characteristics of predictive factors for hypertension in biopsy-proven IgA nephropathy patients with superimposed preeclampsia (SPE). PATIENTS AND METHODS: The subjects were 34 Japanese women with IgA nephropathy whose renal specimen for histological tests was obtained before pregnancy. We retrospectively investigated the relevant clinical factors to explain a rise in blood pressure (BP). The histological findings were evaluated with respect to the quantitative measurements of both global glomerulosclerosis and interstitial damage. RESULTS: Renal biopsies before pregnancies showed that the global glomerular sclerosing index and interstitial damage in the SPE group were significantly higher than in the normal group. The prevalence of SPE was 38.2 % (normal pregnancy 21, SPE 13 cases). The neonatal death rate was 3.0 % (1/34)overall. Just before conception, systolic blood pressure (SBP), serum creatinine (Cr)and blood urea nitrogen (BUN) concentration in the SPE were significantly higher than in normal pregnancies. In contrast, CCr and eGFR were lower in the SPE group than in the normal group. At delivery, serum Cr, BUN and uric acid (UA) concentration in the SPE group were significantly higher than in the normal group. In contrast, CCr and eGFR were lower in the SPE than in the normal group. At delivery, correlation analysis revealed a significant correlation between SBP or diastolic BP (DBP) and the histological severity, between SBP or DBP and daily protein excretion, and between SBP or DBP and serum Cr concentration. With respect to the birth weight of newborns, there was a significant negative correlation between the birth weight and the global glomerular sclerosing rate, and between the birth weight and serum Cr concentration or BUN. A stepwise multiple regression analysis showed that predictive factors for a rise in SBP during pregnancy were the degree of interstitial damage and daily urinary protein excretion. These results suggest that renal function, the magnitude of urinary protein excretion, serum Cr, BUN, UA concentrations, and the severity of histological abnormalities are all associated with SPE occurrence. The predictors of a rise in BP were interstitial damage and urinary protein excretion at pregnancy. In addition, Receiver Operating Characteristic (ROC) analysis showed that both glomerular sclerosis and interstitial damage could be potential predictors for SPE. CONCLUSION: Histological severity in renal biopsy, urinary protein excretion and renal function are associated with SPE in patients with IgA nephropathy. Among these associations, the histological findings and urinary protein excretion may serve as useful predictors for a rise in BP." [14]

"Preeclampsia is increasingly being recognised as more than an isolated disease of pregnancy. In particular, preeclampsia has emerged as an independent risk factor for maternal cardiovascular disease and has recently been recognised as a risk factor for cardiovascular disease in children exposed in utero. Preeclampsia and cardiovascular disease may share important pathophysiological and molecular mechanisms and further

investigation into these is likely to offer insight into the origins of both conditions. This paper considers the links between cardiovascular disease and preeclampsia and the implication of these findings for refinement of the management of patients whose care is complicated by preeclampsia." [15]

To evaluate the parameters of oxidative stress and anti oxidant defense in preeclampsia and thereby find any etiological correlation. methods: Study was carried out on pregnant and non pregnant women attending or admitted in the Obstetrics and Gynecology Department of SSG Hospital, Baroda between 1st June 2007 to 31st May 2008. Each serum sample from different groups was evaluated for malondialdehyde (MDA), a product of lipid peroxidation process as a marker for oxidative stress and reduced Glutathione, Superoxide Dismutase, and Catalase for antioxidant enzyme activity and a comparison drawn and analyzed using t-test and chi(2) test. The levels of MDA (a lipid peroxidation product) increased significantly in pregnancy compared to non-pregnant females and further significantly increased in preeclampsia compared to normal pregnant females. The superoxide dismutase levels, catalase levels and vit-E levels were found to be increased in preeclamptic females as compared to normal pregnant females. Preeclampsia is found to be a condition with markedly increased oxidative stress as is evidenced by highly significantly increased levels of MDA, a marker of lipid peroxidation. Levels of antioxidant enzymes, viz. reduced glutathione, superoxide dismutase, catalase and vitamin E have been found to be increased in preeclampsia as compared to normal pregnant females. This may be a compensatory mechanism for handling the increased oxidative stress." [16]

"The aim of our study was to investigate a possible correlation between the expression of the placenta-secreted hormones, beta-subunit of human chorionic gonadotrophin (betahCG) and pregnancy-associated plasma protein A (PAPP-A), during the first trimester screening and the development of preeclampsia. METHODS: A total of 155 patients between 11 + 0 and 13 + 6 weeks of gestation were enrolled in this study. PAPP-A and betahCG levels were measured using the KRYPTOR(R) system. RESULTS: The serum levels of betahCG were significantly higher in pregnancies which subsequently developed preeclampsia. The PAPP-A concentration did not differ significantly in pregnancies complicated by preeclampsia than in uncomplicated pregnancies. CONCLUSION: These results might contribute to developing new tests in the prediction of preeclampsia." [17]

"The aim of this study was to investigate whether the nitric oxide (NO) pathway is altered in pregnancies that develop preeclampsia (PE). This was a nested case-control study of screening for PE, in which plasma asymmetric dimethylarginine (ADMA), L-arginine and L-homoarginine were measured at 11(+0)-13(+6) weeks. In all, 75 pregnancies that developed PE, including 25 requiring delivery before 34 weeks (early PE), and 300 unaffected controls were included. L-arginine and L-homoarginine were measured by gas chromatography-mass spectrometry, whereas ADMA was measured by gas chromatography-tandem mass spectrometry. Multiple regression analysis was used to determine if any maternal characteristics or gestation were significant predictors. In the early-PE group, both L-arginine and L-homoarginine expected medians (MoMs) were significantly reduced (median, IQR: 0.85, 0.76-1.04 vs 0.98, 0.88-1.16, P=0.021 and 0.78, 0.65-0.96 vs 0.99, 0.77-1.31, P=0.006, respectively) but ADMA MoMs were not significantly different (P=0.599). In early PE, compared with controls, the ratios of ADMA to L-arginine MoMs and ADMA to L-homoarginine MoMs were increased (median, IQR: 1.19, 0.94-1.33 vs 1.01, 0.75-1.31, P=0.003 and 1.21, 0.93-1.61 vs 0.99, 0.87-1.16, P=0.012, respectively). There were no significant differences between late PE and controls in ADMA, L-arginine, L-homoarginine or their ratios. In conclusion, development of early PE is associated with altered NO metabolism and/or synthesis apparent from the first trimester." [18]

"Preeclampsia (PE) is one of the main causes of maternal and fetal morbidity and mortality in the world, causing nearly 40% of births delivered before 35 weeks of gestation. PE begins with inadequate trophoblast invasion early in pregnancy, which produces an increase in oxidative stress contributing to the development of systemic endothelial dysfunction in the later phases of the disease, leading to the characteristic clinical manifestation of PE. Numerous methods have been used to predict the onset of PE with different degrees of efficiency. These methods have used fetal/placental and maternal markers in different stages of pregnancy. From an epidemiological point of view, many studies have shown that PE is a disease with a strong familiar predisposition, which also varies according to geographical, socioeconomic, and racial features, and this information can be used in the prediction process. Large amounts of research have shown a genetic association

with a multifactorial polygenic inheritance in the development of this disease. Many biological candidate genes and polymorphisms have been examined in their relation with PE. We will discuss the most important of them, grouped by the different pathogenic mechanisms involved in PE." [19]

"To determine whether there is a seasonal impact on the prevalence of preeclampsia in the tropical climate of Bangkok. MATERIAL AND METHOD: Medical records of all singleton pregnant women who delivered in the authors' institution between 2008 and 2009 were reviewed. The meteorological variables during the study period were obtained from database of the Thai Meteorological Department. The period of study was then divided into two main seasons: monsoon and dry seasons. The rates of preeclampsia occurring in the two seasons, based on the date of conception and date of delivery, were compared. RESULTS: Data of 7,013 gravidas were included for analysis. Of these, 327 (4.7%) developed preeclampsia. The monsoon season had lower mean maximum temperature (37.0 degrees C vs. 38.1 degrees C, $p = 0.114$), was more humid (77.0% vs. 68.7%, $p < 0.001$) and had higher daily rainfall (196.5 mm vs. 37.0 mm, $p < 0.001$) than dry season. Women who conceived in the dry season were at greater risk to develop preeclampsia than those who conceived in the monsoon season (5.3% vs. 3.7%, adjusted OR 1.51; 95% CI 1.18-1.93). The preeclampsia rates of women who delivered in both seasons were not significantly different: 5.0% in the dry season vs. 4.3% in the monsoon, $p = 0.178$. CONCLUSION: There is a seasonal impact on the prevalence of preeclampsia based on the time of conception, but not the time of delivery. The rate of preeclampsia is significantly higher when conception occurs in the dry season." [20]

"In this study, to search for novel preeclampsia (PE) biomarkers, we focused on microRNA expression and function in the human placenta complicated with PE. By comprehensive analyses of microRNA expression, we identified 22 microRNAs significantly upregulated in preeclamptic placentas, 5 of which were predicted in silico to commonly target the mRNA encoding hydroxysteroid (17-beta) dehydrogenase 1 (HSD17B1), a steroidogenetic enzyme expressed predominantly in the placenta. In vivo HSD17B1 expression, at both the mRNA and protein levels, was significantly decreased in preeclamptic placentas. Of these microRNAs, miR-210 and miR-518c were experimentally validated to target HSD17B1 by luciferase assay, real-time PCR, and ELISA. Furthermore, we found that plasma HSD17B1 protein levels in preeclamptic pregnant women reflected the decrease of its placental expression. Moreover, a prospective cohort study of plasma HSD17B1 revealed a significant reduction of plasma HSD17B1 levels in pregnant women at 20 to 23 and 27 to 30 weeks of gestation before PE onset compared with those with normal pregnancies. The sensitivities/specificities for predicting PE at 20 to 23 and 27 to 30 weeks of gestation were 0.75/0.67 (cutoff value=21.9 ng/mL) and 0.88/0.51 (cutoff value=30.5 ng/mL), and the odds ratios were 6.09 (95% CI: 2.35-15.77) and 7.83 (95% CI: 1.70-36.14), respectively. We conclude that HSD17B1 is dysregulated by miR-210 and miR-518c that are aberrantly expressed in preeclamptic placenta and that reducing plasma level of HSD17B1 precedes the onset of PE and is a potential prognostic factor for PE." [21]

"To correlate the severity of the disease, maternal and perinatal outcome with Lactic Dehydrogenase (LDH) levels in serum in patients of preeclampsia and eclampsia. METHODS: A prospective comparative study was conducted in the department of Obstetrics and Gynecology in the collaboration with department of Pathology, CSM Medical University, Lucknow. Out of 146 women studied, 39 were normal pregnant women, 35 were of mild preeclampsia, 36 of severe preeclampsia and 36 of eclampsia. The statistical analysis was done by Chi-square test (for proportional data) analysis of variance and sample "t" test (for parametric data). RESULTS: LDH levels were significantly elevated in women with preeclampsia and eclampsia (<0.001). Higher LDH levels had significant correlation with high blood pressure ($P < 0.10$) as well as poor maternal and perinatal outcome. CONCLUSION: High serum LDH levels correlate well with the severity of the disease and poor outcomes in patients of preeclampsia and eclampsia." [22]

"Previous studies have demonstrated a common variant of the obesity and fat mass-related FTO gene, rs9939609, to be associated with obesity, type 2 diabetes, and elevated blood pressure. We investigated whether the FTO SNP rs9939609 is associated with the risk of preeclampsia (PE) in a Finnish study population. 485 women with prior PE and 449 women who had given birth after a normotensive pregnancy were genotyped (TaqMan) for the SNP rs9939609. The prevalences of genotypes AA, AT, and TT were 15%, 53%, and 32%, respectively, among the PE cases, and 16%, 47%, and 37%, respectively, among the controls ($P = 0.199$). We found no evidence of an association between the FTO SNP rs9939609 and PE. However, our cases were dominated by severe, early-onset

PE. Thus, we are unable to exclude an association with the milder, later-onset form of the disease in which the role of maternal metabolic predisposition could be more significant." [23]

CONCLUSION

•Women bearing pre-eclampsia, endure high blood pressures, (greater than 140/90) and proteinuria. This condition can occur any time during pregnancy, but customarily occurs in the second half of pregnancy (subsequent to week 20 of pregnancy) or in the first few days after birth.

•Pre-eclampsia has been seen in 5 to 8 percent of pregnancies in the United States. It is not known yet why some women experience preeclampsia. Up to this date, no reliable test can predict or diagnose the occurrence of pre-eclampsia prior to existence, and there is no known way to prevent this disease.

•Most women with mild preeclampsia exhibit no symptoms, although mild preeclampsia can deteriorate, and become severe.

•In case of encountering warning signs, the mother should visit her doctor immediately to lessen symptoms. Symptoms like; decreased fetal activity, vaginal bleeding, frequent uterine contractions with pain can be alarming.

•The mere treatment for preeclampsia is solely delivery of the fetus, and removal of placenta . With sufficient bed rest and medication consumption high blood pressure levels, can descend to be normal, pre-eclampsia worsening can be prevented, and the risk of complications diminishes.

•The physician may recommend natural childbirth after appraising results.

•If women with pre-eclampsia are left untreated, will undergo convulsions, and should be treated with medications. Magnesium Sulfate, is the most common medication used to prevent seizures. This drug is safe for the mother and baby. Furthermore, this drug is administered intravenously during delivery to the mother, and its administration usually continues to persist up to 24 hours after delivery.

•Subsequent to delivery, high blood pressure and proteinuria, typically disappear within a few days. However, some hypertensive women need medical attention even after being discharged from the hospital.

•Most women enduring pre-eclampsia will not experience it in their future pregnancies.

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