INTRODUCTION

The placenta is a unique organ, short lived by design. Its existence is essential for the survival of human embryo/foetus in the intra uterine environment. The placenta performs diversity of functions, ranging from anchoring the fertilized ovum, preventing its rejection by the maternal immune system to enabling the transport of nutrients and wastes between the mother and the embryo/foetus.

Human placenta is a discoid, circular, membranous vascular and haemo-chorio-deciduate organ, which connects the foetus with the uterine wall of the mother. It is a structure where maternal and foetal tissues come in direct contact without rejection, suggesting immunological acceptance of the foetal graft by the mother.

The placenta was first recognized by an early Egyptian named Realdus Columbus in 1559. The word placenta comes from the Latin word Plakos means “cake” or from Greek Plakoenta meaning “flat, slab-like”, referring to its round and flat appearance in humans.

The placenta is the most accurate record of infant’s prenatal experiences. Generally physicians are uncomfortable with the task of examining the placenta, they should willingly undertake it because submitting this organ to a knowledgeable look and touch can provide much insight in to prenatal life.

Structural and functional derangement of placenta evokes a considerable interest, as this may be the only yardsticks to measure adequacy of the foetal environment.

As the placenta is the direct link between mother and foetus, the examination of placenta gives a clear idea of what had happened with it, when it was in the mother’s womb and what is going to happen with the foetus in future.

Now a days, hypertensive disorders complicating pregnancy (Toxaemia of pregnancy) are common and forming a deadly triad along with haemorrhage and infection. Pre-eclampsia (PE) is considered severe if one or more of the following criteria are present:
Blood pressure 140 mm Hg or higher systolic or 90 mm Hg or higher diastolic after 20 weeks of gestation in a woman with previously normal blood pressure

Proteinuria: 0.3g or more of protein in a 24-hour urine collection (usually correspond with 1+ or greater on a urine dipstick test) known as mild preeclampsia.

When systolic blood pressure of 160 mmHg or higher or 110mmHg or higher diastolic on two occasions at least six hours apart in a woman on bed rest ,the condition is known as severe preeclampsia it is associated with proteinuria and oliguria, Cerebral or visual disturbances, Pulmonary edema of cyanosis, Epigastric pain or right upper quadrant pain, Impaired liver function, Thrombocytopenia and Foetal growth restriction. Conflicting findings have been reported regarding hypertension in pregnancies 6.

PIH is a cause of large number of maternal deaths and there of foetal deaths. Maternal hypertension (toxaemia of pregnancy) is diagnosed in 6-10% of all deliveries; is associated with 22% of all perinatal foetal deaths and 30% of all maternal death 7.

In some mysterious way, in certain women, the presence of chorionic villi with a foetus incites vasospasm and hypertension 8. As a consequence of this vasospasm; villi in these placentas are subjected to a reduced maternal utero-placental blood flow 9.

A number of microscopic abnormalities in the villi like Decreased villous vascularity, Basement membrane thickening, Stromal fibrosis, Cytotrophoblastic cell proliferation, Syncytial knot formation and villous fibrinoid necrosis are thought to represent a response, often a compensatory in nature to the disturbances in blood flow 10.

It has been emphasized that the most striking changes are cytotrophoblastic cell proliferation and thickening of basement membrane 11.

Women who have or develop high blood pressure are all increased risk of complications antenatally, intrapartum and in the puerperium, lead to increased risk to the mother as well to the foetus 12.
Pregnant women with hypertension can be divided into two groups: normotensive women who develop the preeclamptic syndrome, which is characterized by hypertension, proteinuria, and edema; and women with chronic hypertension who become pregnant and are at higher risk of developing superimposed preeclampsia

The impact of preeclampsia affects both mother and fetus, but it is important to differentiate between the complications of the disease from those inevitably associated to the drugs used for its treatment

Preeclampsia is the most serious form of hypertensive pregnancy complication, but it is not primarily a hypertensive disease; it is a disorder induced by factors based on the presence of abnormal placenta

preeclampsia is initiated by abnormal placentation and therefore, a low prefunded placenta, release of cytokines and other toxins, and vasoconstriction and platelet activation; So, it is a syndrome of generalized endothelial dysfunction, and the complication are associated with the vascular system. Fundamentally, these complications are intravascular coagulation, bleeding and multiple Organ failure (hepatic and renal) following poor perfusion

The process is completely reversed by the delivery of the foetus and placenta, but intrauterine growth retardation and premature delivery pose major threats to the foetus and may require much care in a tertiary care centres

Treatment of preexisting or pregnancy-induced hypertension does not prevent or reverse the process, but is justified to prevent maternal cardiovascular complications, especially during labor and delivery. Foetus is at increased risk due to growth retardation and hypoxia following placental damage

Perinatal outcome strongly influenced by gestational age and the severity of hypertension as expressed by the need for antihypertensive treatment, irrespective if the underlying syndrome preeclampsia is associated with degree of fetal injury. The main impact on the fetus is under nutrition as a result of utero-placental vascular insufficiency, which leads to
growth retardation. Long term follow up studies have demonstrate that babies who suffered intra uterine growth retardation are more likely to develop diabetes mellitus, hypertension, coronary artery disease adult life due to catecholamine released from the mother at the time gestational period\textsuperscript{13,14}.

The pathogenesis of pre-eclampsia remains obscure but it has been considered to be a multifactorial and multisystemic disorder especially with a genetic predisposition\textsuperscript{15}. Several feature of the renin-angiotensin aldosterone system (RASS) in pre-eclampsia differ from that in normal pregnant state. RAAS could be the foundation for the genetics of preeclampsia and the various gene polymorphisms of RAAS seem most likely related to the development of pre-eclampsia disease\textsuperscript{15,16,17}.

Angiotensin-converting enzyme (ACE) is a monomeric, membrane-bound, zinc and chloride dependent peptidyl dipeptidase that catalyses the conversion of decapetide angiotensin I to the octapeptide angiotensin II, by removing a carboxy terminal dipeptide. ACE has long been known to be a key part of renin-angiotensin system (RAS) that regulates blood pressure\textsuperscript{18}.

ACE plays a vital role in the RAS which regulates blood pressure by converting angiotensin I into a powerful vasoconstrictor angiotensin II. High ACE activity can contribute to hypertension because of its vasoconstriction effect\textsuperscript{19,20}.

An insertion, deletion (I/D) polymorphism in the ACE gene occurs due to the insertion or deletion of the Alu 280 base pairs (bp) sequence located in intron 16\textsuperscript{21}. A deletion polymorphism (D allele) has been reported to be associated with elevated ACE activity. Some investigators have reported in women from various geographical origins an association between the ACE D and I allele, DD genotype is associated with higher serum ACE levels, whereas the II genotype is associated with lower levels, the ID genotype is associated with intermediate levels. Moreover it has been assumed that the I allele has a sequence similar to a silencer sequence, which might explain why the D allele is associated with increased risk of preeclampsia or PIH\textsuperscript{21}.