AN OVERVIEW; SCREENING FOR PREECLAMPSIA IN PREGNANCY AND RISK FOR GROWTH RESTRICTION, ROLE OF NURSING AND PHARMACIST IN MANAGEMENT APPROACH

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Abstract: It is a hypertension condition that manifests itself during pregnancy and is known as preeclampsia. The early identification and quick management of preeclampsia are necessary in order to reduce morbidity and death associated with the condition. The involvement of nurses and pharmacists in approaching care and drug adherence is also important. When it comes to making decisions about the use of medicine during pregnancy, a community pharmacist is typically the first healthcare practitioner that is contacted for help. A woman frequently finds out she is pregnant when she is already taking a drug, and she goes to a pharmacy that is conveniently accessible in order to inquire about whether or not she has caused harm to her unborn child by taking the prescription. This is because fifty percent of pregnancies are unplanned. It may be concluded that beginning low-dose aspirin treatment during the early stages of pregnancy is an effective technique for lowering the risk of developing preeclampsia and intrauterine growth restriction (IUGR).

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Introduction:

Hypertensive disorders of pregnancy are defined by the International Society for the Study of Hypertension in Pregnancy (ISSHP) as new onset hypertension (≥140 mmHg systolic or ≥90 mmHg diastolic) after 20 weeks of gestation [1]. These illnesses impact ten percent of all pregnancies. Chronic hypertension, gestational hypertension, and preeclampsia (either de novo or superimposed on chronic hypertension) are all included in this umbrella definition of hypertension during pregnancy. Both of these disorders have the potential to have major effects, both in the short term and over the long term, on the health of the mother and the foetus. For the mother, this includes an elevated risk of long-term hypertension that is two to four times higher, a risk of cardiovascular mortality and severe adverse cardiovascular events that is twice as high, and a risk of stroke that is 1.5 times higher than before [2]. For the foetus, this includes the prenatal risks of intrauterine growth restriction (IUGR), premature delivery (which is most usually caused by medical intervention), oligohydramnios, placental abruption, fetal discomfort, and foetal mortality in utero [3]. Additionally, there is a growing body of research suggesting that in utero exposure to hypertensive diseases of pregnancy can result in severe long-term cardiovascular sequelae in the children. These sequelae include early onset hypertension, as well as an increased risk of ischemic heart disease and stroke. These sequelae have been linked to hypertensive pregnancies, and this association has been shown independently of any other pregnancy difficulties that may be present [4].

Initial manifestations of preeclampsia often manifest themselves in pregnancies that are nearing their full term. Other significant findings that may or may not be a part of the clinical presentation include proteinuria, signs of end-organ damage, such as thrombocytopenia, impaired liver function, severe persistent right upper quadrant or epigastric pain, excluding all other alternative diagnoses, new-onset headache unresponsive to all forms of management, pulmonary edema, or renal insufficiency with abnormal lab values. There are more subcategories of preeclampsia that differentiate themselves from one another. These subcategories include categorization into moderate or severe preeclampsia, which is determined by presentations and clinical criteria, which will be discussed later [5].

The underlying etiology of preeclampsia is not well known, despite the fact that there is a substantial understanding of the clinical presentation, diagnostic criteria, and therapy of preeclampsia that is being applied frequently. Preeclampsia is thought to be caused by aberrant placentation, which can lead to substantial maternal physiologic dysfunction. This notion is widely acknowledged as a possible explanation for the condition. The etiologic origin of preeclampsia has been found to originate from defective placentation, which results in improper spiral artery remodeling, placental ischemia, hypoxia, and oxidative stress [6]. This is despite the fact that there are hurdles that need to be overcome.

Review:

According to the guidelines published by the National Institute for Health and Care Excellence (NICE) in 2019, a woman is considered to be at a high risk of developing preeclampsia if she has a history of hypertensive disease during a previous pregnancy or if she has a maternal disease such as chronic kidney disease, autoimmune diseases, diabetes, or chronic hypertension. All women who are nulliparous, who are at least 40 years old, who have a body mass index (BMI) of at least 35 kg/m, who have a family history of preeclampsia, who have had a pregnancy with multiple foetuses, or who have had a pregnancy interval of more than ten years are considered to be at a moderate risk [6]. The greatest meta-analysis of clinical risk factors that has ever been undertaken, which included the examination of over 25 million pregnancies from 92 different studies, found that these risk variables are consistent with one another. Aspirin prophylaxis, which is beneficial in lowering the risk of preeclampsia if provided before 16 weeks of pregnancy, has to be guided by the existence of one high risk factor or two or more intermediate risk factors. This is done in order to assist guide the administration of the medication [7].

Other clinical factors, such as elevated mean arterial blood pressure prior to 15 weeks of gestation, polycystic ovarian syndrome, sleep disordered breathing, and a variety of infections, such as periodontal disease, urinary tract infections, and helicobacter pylori, are also known to significantly increase the likelihood of developing preeclampsia. As far as the obstetric history is concerned, the presence of vaginal bleeding for a period of at least five days during pregnancy is associated with an increased risk of preeclampsia. Additionally, the utilization of oocyte donation is associated with a greater risk of preeclampsia in comparison to in vitro fertilization (IVF) without oocyte donation or spontaneous conception [7].

As potential additional indicators of preeclampsia, biochemical and ultrasonography markers are now being pursued for further research. The likelihood of a woman developing preeclampsia can be affected by fetal characteristics such as her genotype and the presence of foetal cell-free DNA in her mother's blood [8]. A mutation in the foetal genome that is located close to the locus of fms-like tyrosine kinase-1 (Flt-1) was shown to be associated with the development of preeclampsia, according to a genome-wide association research that was conducted not too long ago [8]. The study included 4380 cases of preeclampsia and 310,233 controls. An other possible indication is an increase in the amount of cell-free fetal DNA found in the blood of the mother, which can be detected prior to the beginning of symptoms. Placental growth factor (PlGF) and soluble Flt-1 (sFlt-1) are the foetal and placental biomarkers that carry the greatest potential for detecting preeclampsia. These biomarkers will be described in more detail in the following paragraphs. A number of meta-analyses have shown a possible correlation between preeclampsia and high levels of blood triglycerides, cholesterol, and inflammatory markers such as C-reactive protein (CRP), interleukin-6 (IL-6), interleukin-8 (IL-8), and tumor necrosis factor-alpha (TNFα), some of which occur prior to the beginning of preeclampsia [9]. When it comes to predicting preeclampsia, the findings of uterine artery Doppler study are inconsistent. Utilization between 11 and 14 weeks can predict preeclampsia with an accuracy that is comparable to that of clinical risk variables, according to a meta-analysis that was conducted not too long ago [10]. The use of specialized tests into clinical risk prediction models, such as the uterine artery pulsatility index and pregnancy-associated plasma protein A (PAPP-A), has the potential to boost the positive predictive value for identifying women who are at risk of developing this disease [10].

Therefore, aspirin is the only treatment that has strong evidence to support its use in lowering the risk of preeclampsia in women who are at a high risk for developing the condition. Current recommendations propose taking a modest dose of aspirin (75–150 mg) as a preventative measure beginning 12 weeks during pregnancy and continuing until delivery [10]. It is predicted that taking low doses of aspirin before to 16 weeks of gestation has a minor but consistent impact, which is to lower the incidence of preeclampsia by around 10% [9]. A tiny but consistent effect. Other approaches, including as nutritional supplements, pharmaceutical medications, and dietary and lifestyle interventions, have been explored for their potential to possess protective effects against preeclampsia, with the results differing in terms of their effectiveness. Studies have shown that a lack of vitamin D might raise the chance of developing preeclampsia [11], and that taking vitamin D supplements may be beneficial in lowering the risk of developing preeclampsia. However, despite the fact that supplementation is frequently advised in clinical practice, there is still a need for substantial data from randomised controlled trials (RCTs) to demonstrate its usefulness [12]. A comprehensive randomised controlled trial (RCT) was carried out by the World Health Organisation to investigate the effect of calcium. The results of the study showed that supplementation did not reduce the incidence of preeclampsia in a population that was deficient in calcium. However, the severity and consequences of preeclampsia were much lower in the group that received supplementation [12]. A decrease in preeclampsia was shown in a 2018 Cochrane review of high dosage (>1 g/day) calcium supplementation beginning at 20 weeks of gestation; however, this conclusion was based on a limited number of studies and is likely an overestimate [13]. According to the most recent guidelines, this is evidence that pregnant women who are lacking in calcium should take calcium supplements [13]. There is no evidence that taking antioxidant vitamins C and E supplements will help prevent preeclampsia [13], despite the fact that these supplements first showed promising outcomes. For the same reason, it does not appear that large doses of folic acid have any prophylactic benefits. However, there is some data that shows that supplementation with 5-methyl-tetrahydrofolate, which is a more accessible form of folic acid, may be useful in avoiding recurrent preeclampsia [14].

Conclusion:

Based on the findings of this analysis, it appears that the effectiveness of aspirin in preventing preeclampsia, severe preeclampsia, and fetal growth restriction (FGR) in high-risk women is dose-dependent and is at its peak when it occurs 16 weeks into pregnancy. In an ideal scenario, the roles of the physician and the pharmacist in terms of medication information would be reversed. The physician would ask the pharmacist for information about pharmaceuticals associated with pregnancy-related issues, rather than the pharmacist immediately sending the lady to her physician. The correct administration and management of drugs during pregnancy is a vital component of prenatal care. Community pharmacists are regularly sought

out by pregnant women and their health care providers for information and guidance about the appropriate use and management of medications during pregnancy. According to the findings of the most extensive study that investigated the perception of risk associated with drugs during pregnancy, the three sources of information that were accessed the most frequently were the primary care physician, the product information leaflet, and the pharmacist. There are currently only a few therapies available to lower the risk of early fetal problems associated with preeclampsia. These procedures include the administration of prenatal corticosteroids and magnesium sulphate infusions. The primary objective of these interventions is to avoid bad outcomes that are linked with preterm or premature birth. For the purpose of better understanding the potential advantages of dietary, lifestyle, and home-monitoring therapies for the pre- and post-delivery management of preeclampsia, further study in this subject is required. Other possible benefits include those for the mother and her kids.

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