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Determine the Connection Between Endometriosis and Hypertensive Disorders During Pregnancy: A Systematic Review

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ABSTRACT

This study is designed to explore the correlation between endometriosis and hypertensive disorders during pregnancy. We looked through the Cochrane Library, PubMed and Scopus, for pertinent papers to the end of 2023. Included were full-text qualitative research studies that were published in English and provided a definitive diagnosis of endometriosis. While pregnant women without a prior endometriosis diagnosis made up the control group, pregnant women having an endometriosis diagnosis at any stage were included in the case group. The data was separately extracted and examined by two authors. A third author reviewed the entire manuscript to resolve disagreements. Data extraction and screening were done using Endnote X9. Review Manager 5.3's fixed and random effects models were employed to examine the combined data. The Downs and Black checklist were used to evaluate the included studies' quality. This analysis found that pregnancy-related hypertension disorder in 3116 endometriosis-affected women. The study confirmed that endometriosis may raise the risk of pregnancy-induced hypertension and conditions related to hypertension. Raising knowledge of hypertension diseases during pregnancy will help create screening and early diagnosis strategies that are effective.

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INTRODUCTION

Specifically on the ovaries, fallopian tubes, pelvic peritoneum, and uterosacral ligaments, endometriosis is a persistent gynecological illness marked by the presence and proliferation of estrogen-dependent endometrial structures outside the uterine cavity [1]. According to ESHER recommendations, the existence of clinical symptoms is necessary for the diagnosis of endometriosis. Infertility, lower abdomen pain, intestinal dysfunction, dyspareunia, irregular bowel motions, and severe dysmenorrhea are all clinical manifestations of endometriosis [2].

Pre-eclampsia, gestational hypertension, and chronic hypertension are all extremely common pregnancy-related hypertensive illnesses that can have detrimental effects on the mother and the fetus [3]. Pregnancy obesity, twin or multiple pregnancies, rising age, primigravida, and some chronic conditions such polycystic ovary syndrome (PCOs), overt diabetes, chronic kidney disease (CKD), and autoimmune illness are existing causes for hypertensive disorders [4].

It is recognized that endometriosis is a chronic inflammatory and immunological condition [5]. Numerous immune cells and mediators have been linked to preeclampsia onset. Blood pressure problems during pregnancy may result from improper remodeling of the uterine spiral arteries or errors in placental invasion [6]. Nonetheless, there appears to be in dispute information about the association underlying endometriosis and pregnancy-related hypertensive concerns. Although some research has indicated a strong correlation between the two [7]. Other investigations have proposed the contrary [8].

Clarifying the function of endometriosis as a predictor of ensuing hypertensive problems in endometriosis patients who became pregnant naturally is crucial. The present systematic study set out to look at any potential associations regarding endometriosis and hypertensive disorders during pregnancy.

METHODS

Procedure for the study

The Preferred Reporting Items for Systematic Reviews criteria [9] were followed in the course of this systematic review of observational studies.

Methodology for searching

We included papers from databases that were created up until December 2023 in this review. MeSH keywords and terms were used to conduct systematic searches on PubMed, Scopus, and Cochrane Library, Among the keywords were "Endometriosis," "Preeclampsia," and "Pregnancy-related hypertension."

Criteria for exclusion and inclusion

Using the following inclusion criteria, pertinent studies were chosen: observational research published in

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English, including case-control, cross-sectional, and cohort studies. Studies using qualitative, review, and interventional designs, case report studies, congress presentations, or study protocols were not included in this analysis, nor were studies written in local languages. Whether through imaging, the presence of lesions after surgery (with or without histological confirmation), or International Classification of Disease (ICD)-coded medical records in women who conceived naturally, all of the included studies had a confirmed diagnosis of endometriosis. Because pregnancies created by ART are more likely to result in obstetric problems such pregnancy-induced hypertension and preeclampsia [10]. The International Classification of Diseases (ICD) 8, 9, 10 codes for gestational hypertensive disorders, or a systolic blood pressure of 140 mmHg or a diastolic blood pressure of 90 mmHg after 20 weeks of gestation, were used to diagnose gestational hypertension.

Participants in the study

Pregnant women with endometriosis at any stage or severity were included in the case group of this study, whereas pregnant women without a prior endometriosis diagnosis made up the control group.

Kinds of outcome metrics

The hypertensive diseases of pregnancy, such as gestational hypertension and pre-eclampsia, were the study's outcomes.

Gathering of data and selection of studies

Researchers independently retrieved information from whole texts that qualified. A third author was consulted in order to settle any disagreements or conflicts. Data extraction and screening were done using Endnote X9. The following details were taken out of a table that was made for data gathering: The study's author, location, kind, age of participants, control and case group sample sizes, definitions of PIH and endometriosis, and results

Evaluation of research quality

There were twenty-seven questions on the checklist that assessed different topics. There were ten questions to evaluate reporting bias, three to evaluate external validity, seven to evaluate internal validity, six to evaluate selection bias, and one to evaluate the study's power [11]. The overall quality score was divided into three categories: poor, fair, and good [12]. A score of less than 14 was deemed poor, while a score of 15 to 19 was deemed fair.

RESULTS

From the start of the electronic search strategy until December 2023, we were able to gather 119 papers (PubMed: 91; Scopus: 17; Cochrane Library: 11). 119 of these papers underwent title and abstract screening after 98 duplicates were eliminated. 5 of the twenty-one that were chosen for full-text review were qualified to be part of this evaluation and 16 articles excluded due to insufficient outcomes data. However, total 5 articles eligible and included of this systematic review The follow chart represented in figure 1.

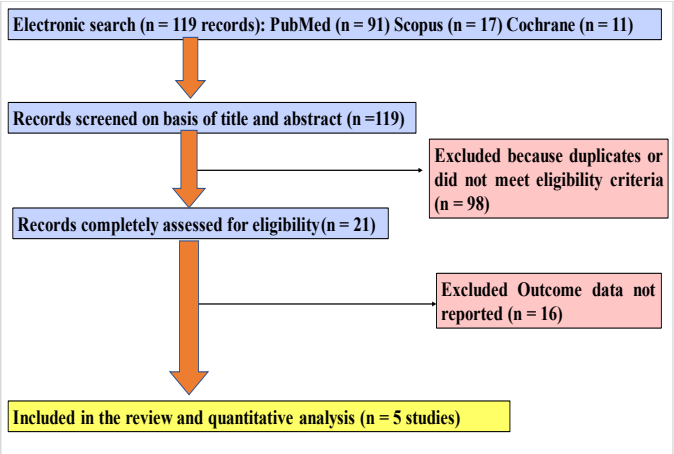

Fig. 1: Flow chart for selection study among systematic review.

Characteristics of the study

The studies' findings are displayed in Table 1. Population-based cohort study (2 publications), case-control studies (1 paper), Prospective cohort study (1 paper) and longitudinal design (1 paper) were among the examined observational studies. There was one study conducted in Italy [13], one in China [14], one in Australia [15], one in France [16] and one in Canada [17]. The trials had somewhere between 10 and 4083732 people. The outcomes of laparoscopy, surgery, the International Classification of Diseases' ICD 9–ICD 10 diagnosis code, or imaging were used to diagnose endometriosis in the included studies. This analysis examined the prevalence of pregnancy-related hypertension problems in 3116 endometriosis-affected women and 15,2206 healthy women that all data represented in figure 2.

In order to determine the relationship between pregnancy disorders, a comprehensive analysis of five endometriosis studies is shown in Table 1.

DISCUSSION

For many years, endometriosis has been the subject of much-needed research attention due to its chronic and incapacitating nature, its mysterious and complex etiology, and its often-ineffective therapeutic options. There is now evidence of endometriosis's adverse impacts over a woman's whole reproductive life. Although pregnant, poor pregnancy results might affect the mother, the newborn, and possibly the offspring's health for the rest of their lives; the latter may be explained by the concept of the developmental beginnings of health and disease.

The purpose of this systematic study was to assess the relationship between endometriosis and hypertensive problems during pregnancy. Five observational studies with an average quality score of moderates were considered. One of the main causes of infertility is endometriosis. From a pathophysiological perspective, it should influence the course of pregnancy [17]. Pregnancy-related hormonal and inflammatory changes are necessary for appropriate decidualization and positioning. Furthermore, these adjustments are required to sustain pregnancy and induce active labor at term. Pregnancy processes may be disrupted in endometriosis due to similar hormonal and inflammatory alterations that can coexist with pregnancy changes [18]. Decreased trophoblast invasion and implantation may result from altered inflammatory pathways controlled by decidua cells in endometriosis [19].

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Table 1. Criteria of studies included systematic review

Study (reference)	Study types	Country	No of participants		Main outcome	
			Case	Control	Case	Control
Ibiebele et al. 2022 [13]	Population-based cohort study	Australia	13 406	55692	Pregnancy hypertension 1378	50231
Velez etal (2022) [14]	Population-based cohort study	Canada	19099	768350	Hypertensive disorder 1042	37660
Xie etal 2023[15]	Case control study	China	188	188	Hypertensive disorder in pregnancy 10	11
Porpora etal 2020 [16]	Prospective cohort study	Italy	145	280	Pregnancy induced hypertension 7	16
Epelboin et al. 2021 [17]	Longitudinal study	France	31,101	4083732	Preeclampsia 679	64,288

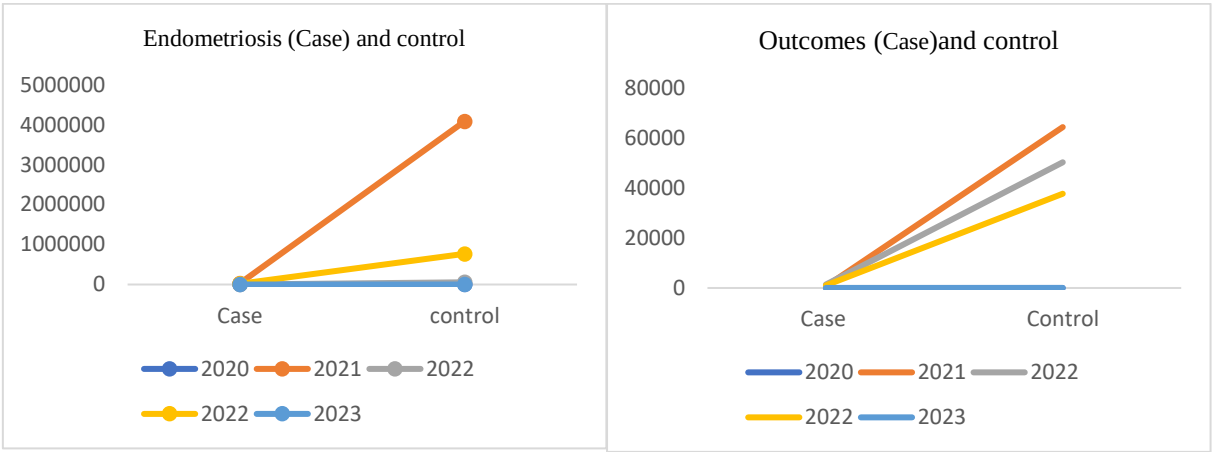

Figure 2. Analyze the case of endometriosis and compare it to the control.

Women with endometriosis are more likely to develop preeclampsia than women without the condition, according to large population-based cohort research [20]. Because publication bias was eliminated, data accuracy increased. Also, laparoscopy and surgery were typically used to confirm the diagnosis of endometriosis. A comprehensive study demonstrated that endometriosis brought on by placental malfunction is linked to a higher risk of unfavorable pregnancy outcomes, such as gestational hypertension and preeclampsia, which is consistent with our findings [21].

It had an extremely large sample size, and the findings indicate a strong correlation between endometriosis and a higher risk of preeclampsia as well as additional consequences like placenta previa and preterm birth. Nonetheless, endometriosis was found to be unrelated to either preeclampsia or gestational hypertension in a systematic evaluation involving over a million women [22]. This is most likely because to the study's shortcomings, which included diagnosis and treatment of pregnancy complications that may vary between studies and inconsistently adjusted confounding factors that applied across the various data sets. Nevertheless, our research merely consists of a systematic review based on limited data. Consequently, we require additional review research that includes numerous cases of preeclampsia and gestational hypertension linked to endometriosis.

CONCLUSION

It was confirmed by this study that endometriosis may increase the incidence of pregnancy induced hypertension and hypertension disorder circumstances. The development of effective screening and early diagnosis methods for hypertensive disorders during pregnancy will be aided by increased awareness of this disorder.

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