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DEVELOPMENT OF ARRHYTHMIAS IN PREGNANT WOMEN AND THEIR IMPACT ON MATERNAL AND FETAL HEALTH

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Abstract: *This article analyzes the causes of arrhythmias in pregnant women, their clinical course, and the impact on maternal and fetal health. During pregnancy, heart rhythm disturbances may result from both physiological and pathological factors. Some arrhythmias are benign, while others pose significant risks to maternal life and fetal development. The primary aim of this study is to investigate the clinical features of arrhythmias during pregnancy and to highlight the challenges of diagnosis.*

Keywords: *pregnancy, arrhythmia, maternal health, fetal development, cardiac rhythm.*

INTRODUCTION

Pregnancy is associated with numerous physiological changes in the female body, particularly within the cardiovascular system. Heart rate increases, blood volume expands, and peripheral resistance decreases, creating an additional burden on the myocardium [1]. While these changes are essential for supporting pregnancy, in some cases, they lead to rhythm disturbances — arrhythmias — which may affect both maternal and fetal health [2].

Recent studies have reported an increasing frequency of arrhythmias in pregnant women. Although some arrhythmias can be considered benign, their potential complications — such as heart failure, thromboembolic events, and fetal hypoxia — must not be underestimated [3]. Accurate diagnosis is often challenging due to difficulties distinguishing between physiological tachycardia

and pathological arrhythmia [4]. Moreover, treatment is complicated by the limited choice of safe antiarrhythmic medications during pregnancy [5].

According to the European Society of Cardiology (ESC) guidelines, special diagnostic and therapeutic approaches are required to minimize risks for both mother and fetus [6]. Severe arrhythmias in pregnancy are associated with an increased risk of maternal morbidity, mortality, and perinatal complications [7].

Therefore, the study of arrhythmias in pregnancy is not only of clinical but also of public health importance.

Materials and Methods

This research was conducted at the clinical base of Alfraganus University between 2021 and 2024. A total of 72 pregnant women aged 19–38 years with suspected arrhythmias were observed.

Inclusion criteria:

- Pregnant women with complaints of palpitations or rhythm disturbances.

Exclusion criteria:

- Patients with severe extracardiac diseases (e.g., endocrine disorders, chronic kidney failure).

Methods:

- Clinical examination: heart rate, blood pressure, respiratory rate, and main complaints.
- Electrocardiography (ECG) and Holter monitoring for rhythm assessment [1,3].
- Echocardiography for structural and functional evaluation [2].
- Fetal well-being assessment: ultrasound and cardiotocography (CTG) [4].

Statistical analysis: Data were processed using SPSS 23.0. Mean values ± standard deviation were calculated. $P < 0.05$ was considered statistically significant [5].

Results

Among 72 pregnant patients, arrhythmias of different forms were identified.

- Sinus tachycardia: 47%
- Extrasystole: 28%
- Paroxysmal supraventricular tachycardia: 15%
- Bradycardia: 6%
- Complex arrhythmias (atrial fibrillation, flutter): 4%

Distribution by trimester:

- 1st trimester: 21%

- 2nd trimester: 33%
- 3rd trimester: 46%

Clinical manifestations:

- Palpitations and rapid heartbeat: 65%
- Dizziness and syncope: 30%
- Heart failure signs (dyspnea, edema): 18%

Impact on fetus:

- Fetal hypoxia: 14%
- Intrauterine growth restriction: 9%
- Perinatal loss: 3%

Statistical analysis confirmed that arrhythmia incidence significantly increased in later trimesters, with sinus tachycardia and extrasystole being the most common types ($P < 0.05$).

Discussion

The findings demonstrate that cardiac arrhythmias are common during pregnancy, particularly in the third trimester. Sinus tachycardia and extrasystole were the most frequent types, consistent with the physiological cardiovascular changes of pregnancy, such as increased cardiac workload and hormonal shifts.

Arrhythmias were associated with maternal symptoms such as palpitations, syncope, and in severe cases, signs of heart failure. These manifestations can lead to significant maternal discomfort and health risks.

Fetal consequences, including hypoxia and growth restriction, indicate that maternal arrhythmias also compromise intrauterine development. These results align with previous studies highlighting the dual impact of maternal rhythm disturbances on both mother and fetus.

Management of arrhythmias in pregnancy remains challenging. Due to potential teratogenic effects of antiarrhythmic drugs, treatment is often limited to lifestyle modification, stress reduction, and electrolyte balance correction. Pharmacological therapy must be carefully tailored and reserved for severe cases.

CONCLUSION

This study revealed that arrhythmias are common during pregnancy, with sinus tachycardia and extrasystole being the predominant types. Their frequency increases during the third trimester, correlating with increased maternal cardiovascular load.

Arrhythmias negatively affect both maternal and fetal health, leading to hypoxia, intrauterine growth restriction, and, in rare cases, perinatal loss.

Early diagnosis through ECG, Holter monitoring, and fetal assessment is crucial.

Treatment strategies should prioritize non-pharmacological interventions, with medications used only when necessary. Individualized management and close monitoring play a vital role in reducing risks for both mother and child.

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