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Maternal and Neonatal Outcomes in Women Complicated with Asthma

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Abstract

Background: Pregnancy complicated by asthma is currently thought to be the most prevalent chronic illness during pregnancy and are linked to a higher risk of complications for both the mother and the newborn baby.

Objective: The purpose of the study was to assess the maternal and neonatal outcomes in women having asthma.

Methods: A prospective observational study involving human populations was conducted at the Duhok Obstetrics and Gynecology Teaching Hospital in Iraqi Kurdistan during a four-year period, from March 2021 to March 2025. Twenty-five patients who were admitted to the obstetrics department participated in the study who had been diagnosed with adult asthma after the age of 18, and had been taking medication for at least two years prior to becoming pregnant. The demographic characteristics such as maternal age, pre-pregnancy body mass index (BMI) (kg/m2), parity, race, and co-morbidities were among the information collected.

Result: The mean maternal age was 27 ± 5.0. With 14 cases (56%) having a BMI of ≥25.0 and 11 cases (44%) having a BMI of <25.0, mothers with asthma were more likely to be obese. The condition was more common in white mothers and multiparous mothers. Only one patient (4%) had an assistant vaginal delivery, whereas eleven patients (44%) had spontaneous vaginal births. Thirteen cases (52%) had caesarean sections ;nine cases (70%) had planned caesarean sections. No cases of maternal mortality has been recorded. There were twenty-five infants born; the neonatal intensive care unit (NICU) admitted 9 cases (36%) of the total. although there had been no reports of stillbirths.

Conclusions: Our results showed that young women of reproductive age who were obese, multiparty, and had chronic hypertension had a higher risk of developing asthma. In general, maternal outcomes were favorable.

Keywords: Asthma; Maternal; Newborn Outcomes; Pregnancy

Introduction

Asthma affects 3 to 8 percent of pregnant women, making it one of the most prevalent medical conditions during pregnancy. During pregnancy, asthma may get better, get worse, or stay the same [1-3]. Preventing acute exacerbations and improving continuous respiratory function are the two main objectives of asthma treatment during pregnancy. The four key elements of successful asthma treatment during pregnancy are pharmacologic therapy, patient education, appropriate management of environmental and other asthma triggers (such as cigarette smoking and exposure to animal allergens), and objective monitoring of the mother's lung function and fetal health as a guide to therapy [4].

Although there have been encouraging animal studies with ipratropium, nedocromil, zafirlukast, montelukast, and omalizumab, published experience in human pregnancy with these agents is more limited. However, studies are encouraging regarding the rarity of adverse effects on human pregnancy outcomes with albuterol and inhaled glucocorticoids. The general principles of pharmacologic therapy for asthma during pregnancy are similar to those in nonpregnant patients and involve a step-wise approach, as advised by national and international guidelines. There are some encouraging human gestational findings for salmeterol and formoterol. Based on more experience treating patients with these drugs, a few medication preferences have been found for managing asthma during pregnancy. Albuterol, a short-acting beta agonist (SABA), is recommended for the treatment of acute asthma symptoms instead of other SABAs. Budesonide is the recommended inhaled medication for those who need a long-term asthma controller. However, other inhaled glucocorticoids can be continued if the patient was well-controlled on one of these medications prior to pregnancy[5-9].

Starting allergy immunotherapy while pregnant is not advised. However, patients who are currently getting allergen immunotherapy and who seem to be benefiting, who are not susceptible to systemic responses, and who are receiving a maintenance concentration or at least a significant amount can continue receiving it during pregnancy [10]. Oxytocin seems to be safe throughout pregnancy for pharmacologic inducement of labour and management of postpartum haemorrhage in asthmatic patients. It is advised to use prostaglandin E1 or E2 instead of analogues of prostaglandin F2-alpha for asthmatic patients who need prostaglandin medication for cervical ripening, induction of labour, uterine haemorrhage control, or pregnancy termination [11-14].

Patients and Methods

A prospective observational study involving human populations was conducted at the Duhok Obstetrics and Gynecology Teaching Hospital in Iraqi Kurdistan during a four-year period, from March 2021 to March 2025. This work was approved by the Duhok Obstetrics and Gynecology Teaching Hospital's Committee for Scientific Research. A patient has given their informed consent. Twenty-five patients who were admitted to the obstetrics department participated in the study. The trial was open to pregnant women who had been diagnosed with adult asthma after the age of 18, had a pulmonologist's confirmed diagnosis of asthma, and had been taking medication for at least two years prior to becoming pregnant. The demographic characteristics such as maternal age, pre-pregnancy body mass index (BMI) (kg/m^2), parity, race, and co-morbidities were among the information gathered from asthma patients.

Information about delivery outcomes, including delivery technique, intensive care unit admission, need for mechanical ventilation, premature labour, preeclampsia, antepartum haemorrhage (APH), and postpartum haemorrhage (PPH). Maternal mortality and venous thromboembolism (VTE) were recorded. Neonatal' sex, birth weight, Apgar scores, gestational age, congenital anomalies ,small gestational age(SGA), stillbirth and NICU admission status were among the demographic information collected.

Statistical analysis:

Data collection and statistical analysis were conducted using the most recent versions of the SPSS software. Quantitative data were expressed as mean ± standard deviation, whilst nominal variables were read as numbers and percentages (%).

Results

The study comprised 25 mothers who were diagnosed with asthma between March 2022 and March 2025. (Table 1) provides an overview of the baseline characteristics of mothers with asthma. The mean maternal age was 27 ± 5.0.With 14cases (56%) having a BMI of ≥25.0 and 11 cases (44%) having a BMI of <25.0, mothers with asthma were more likely to be obese. The condition was more common in white mothers and multiparous mothers. Three cases (12%) had gestational diabetes mellitus (GDM), six cases (24%) had a history of chronic hypertension, and just one case (4%) had hypothyroidism.

Table 1: Baseline characteristics of mothers who have asthma (no.25). Quantitative variables presented as mean ± SD ,nominal variables as number (percent).

BASELINE CHARACTERISTICS	Values
Maternal age (years)	27 ± 5.0
(kg/m^2) BMI Pre-pregnancy <25.0 ≥25.0	 11 (44%) 14(56%)
Parity Primipara Multipara	 9(36%) 16(68%)
Race White Nonwhite	 23(92%) 2(8%)
Comorbidities Chronic Hypertension DM hypothyroidism	 6(24%) 3(12%) 1(4%)

(Table 2) gives the results of deliveries for mothers who have asthma. Only one patient (4%) had an assistant vaginal delivery, whereas eleven patients (44%) had spontaneous vaginal births. Thirteen cases (52%) had caesarean sections ,nine cases (70%) had planned caesarean sections, while four cases (30%) had emergency caesarean sections. One case (4%) required mechanical ventilation, one case (4%) developed APH, also one case (4%) developed PPH. Only two cases experienced preterm labor. No cases of maternal mortality has been recorded.

Table 2: Delivery outcomes of mothers who have asthma (no.25) Nominal variables as number (percent).

Delivery Outcomes	Values
Mode of delivery Spontaneous vaginal delivery Assistant vaginal delivery Cesarean delivery · Emergency · Planned	 11(44%) 1(4%) 13(52%) 4(30%) 9(70%)
Intensive care unit admission	1(4%)
Mechanical ventilation	0(0%)
PPH	1(4%)
APH Abruption Placenta previa	 1(4%)
Preeclampsia	4(16%)
Preterm labour	2(8%)
VTE	0(0%)
Mortality	0(0%)

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(Table 3) highlights how women with asthma fare with their newborns. There were twenty-five infants born. The sex of the newborn was female in 11 cases (44%), and male in 14 cases (56%). Gestational age at delivery was between 34 and 36.6 weeks in 1 case (4%); it was between 37-38 weeks in 24 cases (96%). 18 (72%) of the babies had a pgar score at five minutes of seven or higher, while 6 (28%) had a score between zero and six. The newborn's weight ranged from 2.6 to 3.5 kg; in 15 cases (60%), it was between 2.2 and 2.5 kg, and in 10 cases (40%), it was between 2.6 and 3.5 kg. Additionally, the neonatal intensive care unit (NICU) admitted 9 cases (36%) of the total. although there had been no reports of congenital anomalies and stillbirths.

Table 3: Neonatal outcomes of mothers who have asthma (no.25). Nominal variables as number (percent).

s	Values
Numbers of newborn	25
Sex Male Female	 14(56%) 11(44%)
Gestational age 34-36.6 weeks 37-38week	(34-38)weeks 1 (4 %) 24 (96%)
Birth weight 2.2-2.5kg 2.6-3.5kg	2.2-3.5kg 15 (60 %) 10 (40 %)
Apgar score at 5 minutes ≥7 0-6	 18(72%) 6(28%)
NICU admission	9 (36%)
Congenital anomaly	0(0%)
Still birth	0(0%)

Discussion

Population-based studies account for most reports of maternal asthma and poor outcomes for both mothers and infants [15]. Young and multiparus patients made up the majority of the patients in our investigation. We did not find that pregnant asthmatics had higher pre-existing illnesses, such as diabetes or thyroid disease, but we did find increased obesity and chronic hypertension. Only six preeclampsia cases were recorded in our investigation; nevertheless, a meta-analysis of six studies revealed a correlation between preeclampsia and maternal asthma [16]. Compared to mothers without asthma, mothers with asthma had a higher risk of maternal VTE [17]. There were no VTE instances reported in our study. In contrast to a 2011 meta-analysis of cohort studies. We did not discover that asthmatics were more likely to give birth before their due dates. Women with asthma were found to have a higher risk of placental problems, including placenta previa and placental abruption [18,19]. There was only one placental abruption case reported in our investigation. Because maternal asthma alters the vascular structure and function, short gestational age has been linked to asthma, as evidenced by the higher prevalence of small for gestational age newborns among asthmatic women [20,21]. We discovered 15 cases of SGA newborns in our investigation. Although a 2013 meta-analysis found that women with asthma were more likely to have congenital abnormalities, our investigation did not find that this was the case [22].

Strengths and limitations

The primary benefit of our study is that it was carried out at a tertiary center in Duhok City that received patients for pulmonologist follow-up during the prenatal period after the patient was delivered by a skilled obstetrician. The limitations of this study must be considered. First, the sample size was insufficient. Second, our study did not include a control group. Third our database does not include numerous maternal demographic and lifestyle characteristics, including maternal education, cigarette smoking during pregnancy, and alcohol and drug usage throughout pregnancy. Lastly unfortunately, we were unable to investigate the impact of treatment on pregnancy outcomes because we lacked treatment data.

Conclusions

Our results showed that young women of reproductive age who were obese, multiparty, and had chronic hypertension had a higher risk of developing asthma. In general, maternal outcomes were favorable. Furthermore, the results for newborns were favorable. Further research is needed to compare this specific population group to the general population.

Data availability

The datasets used and/or analyzed during the current study available from the corresponding author on reasonable request.

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Contributions

Amal Abdulhakeem (manuscript writing/editing, Data analysis, data collection collection, design of the study and revised the manuscript for intellectual content).

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