

Perinatal outcomes in Pregnancy with asthma

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Abstract

Objective: To examine the relationship between asthmatic pregnancies and selected maternal and neonatal outcomes in a representative cohort.

Methods: A retrospective cohort study was conducted at the Aga Khan University Hospital during the year 2004. A random selection was made of 65 asthmatic and 63 non-asthmatic singleton births. The neonatal outcomes studied were birth weight, premature birth and Apgar scores at 1 and 5 minutes. The maternal outcomes studied were number of hospital admissions, and number of documented UTI during the studied pregnancy and past history of abortions and stillbirths.

Results: The mean age of asthmatics and non-asthmatics were 28.0 ± 4.9 years and 27.7 ± 3.6 years respectively. The average parity among asthmatic women was 2.97 while that in controls was 2.57 ($p < 0.137$). Neonates born to asthmatic mothers had shorter mean gestational age with increased risk of premature birth and lower Apgar scores. Asthmatic mothers had a greater risk of abortions and low birth weight babies. They also had higher rates of UTI's and hospital admissions.

Conclusion: Asthmatic pregnancies are more likely to result in abortion, premature delivery and low birth weight babies. The asthmatic pregnancies were also linked with higher rates of maternal UTI. Therefore a more vigilant monitoring is required in asthmatic pregnancies.

Introduction

It is estimated that 300 million people of all ages and ethnic backgrounds suffer from asthma, with an increasing burden on governments, health care systems, families, and patients worldwide.¹ The prevalence varies in different parts of the globe; affecting overall 2.36% of the general Indian population.¹ Asthma is the leading cause complicating pregnancy among respiratory diseases. It complicates as much as 6.9% of pregnancies.²⁻⁷ Whether asthma or the medications used to treat it, influence foetal and infant health has become a research question of increasing and urgent interest.

Initial observations showed increased risks from bronchial asthma of preterm birth, low birth weight, pre-

eclampsia, and neonatal death.² Subsequently numerous retrospective and prospective cohort studies have investigated the effects of maternal asthma on pregnancy outcome. Asthma has been associated with an increased incidence of pre-eclampsia, gestational diabetes, preterm delivery, and intrauterine growth retardation, ante-partum and post-partum haemorrhage.³⁻⁶ On the other hand, studies have also shown that maternal asthma, if well controlled, does not result in any significant change in the pregnancy or labour outcomes.⁸⁻¹¹

Moreover, racial differences also affect the perinatal outcomes in asthmatic women.¹² In view of the current situation with increase in the burden of asthma and conflicting results from various studies it is imperative that a regional trend should be observed. The aim of our research was to study the selected neonatal and maternal outcomes of asthmatic pregnancies in a tertiary care setting.

Methods

A retrospective cohort study with convenient sampling was conducted at Aga Khan University Hospital, a private tertiary care hospital in Karachi, Pakistan. A sample of 65 asthmatic and 63 non-asthmatic singleton births was randomly selected from a list of patients that delivered at Aga Khan Hospital during the period of January 2004 to December 2004. Exclusion criteria were: 1) Concurrent medical maternal illnesses that could either mimic asthma or affect the maternal outcomes being studied such as congestive heart failure, chronic bronchitis, pneumonia, pre-existing hypertension and diabetes mellitus 2) Medical or surgical induction of labour 3) Maternal use of drugs (other than those for asthma) during the pregnancy.

The neonatal outcomes studied were birth weight, premature birth and Apgar scores at 1 minute and 5 minutes. The maternal outcomes investigated included number of hospital admissions, number of documented urinary tract infections during the studied pregnancy and past history of abortions and stillbirths.

Urinary tract infections during pregnancy comprised three subsets: 1) Asymptomatic Bacteriuria, which is defined as finding more than 105 colony-forming units per mL of urine.¹³ 2) Acute Cystitis, which is distinguished from asymptomatic bacteriuria by the presence of

symptoms such as dysuria, urgency and frequency in afebrile patients with no evidence of systemic illness.¹³ 3) Acute pyelonephritis is diagnosed when there is urinary bacteriuria accompanied by systemic symptoms or signs such as fever, chills, nausea, vomiting and flank pain.¹³

The analysis was conducted by using the statistical package for social science SPSS (Release 15.0).

Results

A total of 65 asthmatic and 63 non-asthmatic women with spontaneous vaginal delivery were studied for maternal and neonatal outcomes. The mean age of asthmatic and non-asthmatic groups was 28.0 ± 4.9 and 27.7 ± 3.6 years respectively. The age ranges of the two groups were 18-41 years and 20-34 years respectively. The average parity among asthmatic women was 2.97 while that in non-asthmatic was 2.57 ($p=0.137$). The pre-delivery haemoglobin level (asthmatics = 11.30 & non-asthmatic = 10.98) was also found to be similar between the two groups ($p=0.219$).

Neonates born to asthmatic mothers had a shorter mean gestational age with increased risk of premature birth when compared to controls. They also had lower APGAR scores (Table).

Table: Outcomes of pregnancy in asthmatics and non-asthmatics.

	Asthmatics (n = 65)	Non-asthmatics (n = 63)	p-value
Gestational Age	37.39	38.54	0.002
Birth Weight	3.04	3.14	0.067
APGAR = 1 min	7.67	7.95	0.000
APGAR = 5 min	8.69	9	0.000
H/O past abortions	0.62	0.24	0.000
UTI 's during pregnancy	2.03	1.65	0.000
Hospitalization	1.55	1.24	0.000

UTI : Urinary tract infection, H/O: history of

Asthmatic mothers were found to have greater risk of abortion and low birth weight babies. They also had higher rates of UTI's and hospital admissions when compared to controls (Table).

Discussion

In this study, selected neonatal and maternal outcomes in pregnancies with asthma were analyzed in a retrospective cohort in a tertiary care setting. Significant differences were observed in the birth weight, preterm deliveries and APGAR scores among the neonatal outcomes. Among the maternal outcomes the chances of abortion/still birth and urinary tract infections during pregnancy were found to be significantly higher.

The prevalence of asthma increases as communities

adopt western lifestyles and become urbanized. With the projected increase in the proportion of the world's population that is urban from 45% to 59% in 2025, there is likely to be a marked increase in the number of asthmatics worldwide over the next two decades. It is estimated that there may be an additional 100 million persons with asthma by 2025. This increase is even more concerning for South Asian countries and other developing states as urbanization is on the rise and major portion of the population in these countries belong to lower socio-economic class which has the highest asthma prevalence.¹⁴

Pregnancy in asthmatic women has long been studied for adversity of outcomes. Initial observations made from the Norwegian Birth Registry in 1972 suggested increased risks from bronchial asthma of preterm birth, low birth weight, pre-eclampsia, and neonatal death.² Subsequently numerous retrospective and prospective cohort studies have investigated the effects of maternal asthma on pregnancy outcome. Asthma has been associated with an increased incidence of pre-eclampsia, gestational diabetes, preterm delivery, and intrauterine growth retardation.³⁻⁶ Asthmatic women are at increased risk for ante-partum and post-partum haemorrhage.⁴ Severe asthma or systemic corticosteroid treatment (or both) during pregnancy seems to increase the incidence of mild pre-eclampsia in the mother and hypoglycaemia in the infant.⁷ A slightly increased risk for club foot has also been revealed in babies born to asthmatic women as compared to non-asthmatics.¹⁵ Risks of pre-term birth and pre-eclampsia are higher in asthmatic females pregnant with a female foetus, compared to those pregnant with a male foetus.¹⁶ Considering these associations, it is emphasized that maternal asthma be added to the list of conditions that increase the risk of adverse pregnancy outcomes¹⁷. In our study all the parameters that were observed; prematurity, low birth weight, APGAR score at one and five minutes, number of urinary tract infections and the number of previous abortions, showed significant worse outcomes in pregnancies with asthma. These results are consistent with the findings in Western countries^{3,6,9,17-24}.

Asthma, if well controlled, does not significantly affect the outcome of pregnancy and labour.⁹⁻¹¹ Asthmatic females who decrease their medication level during pregnancy, have babies with reduced birth weight and length, with a lower mean gestational age compared with non-asthmatic females, or asthmatic females who increase their medication level during pregnancy⁸. Thus asthma control, severity and its medications does effect the outcomes. Asthma severity was not taken in to account in our study as it was a retrospective study. Other limitations to this study were that the sample was from patients coming to a single private tertiary care hospital, which might not

represent the general population. It is emphasized that there is a need to explore other maternal and neonatal outcomes in this region of the world in preferably larger population based prospective studies.

In conclusion, asthmatic pregnancies are more likely to result in abortion, premature delivery and low birth weight baby. Asthmatic pregnancies are also linked with higher rates of UTI's during pregnancy.

With these results it is imperative that asthmatic women be monitored more cautiously while pregnant, a combined vigilant care should be provided by obstetrician, pulmonologist and pediatrician. Future large scale studies are advised in this region of the world.

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