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MATERNAL AND FETAL OUTCOME IN GESTATIONAL RHINITIS

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ABSTRACT

STUDY OBJECTIVE: Our purpose was to compare maternal outcomes (Incidence of snoring, excessive day time somnolence, obstructive sleep apnoea, Pregnancy induced hypertension and preeclampsia) and fetal outcomes(IUGR,Apgar score at 1 and 5 minutes) in cases of Gestational Rhinitis and controls.

SETTING: The Department of Gynecology and Obstetrics North Bengal Medical College ,Darjeeling,West Bengal.

Participants and measurements: On the day of delivery, 100 women(50 cases and 50 controls) with singleton pregnancies completed a questionnaire about snoring, witnessed sleep apneas, and daytime somnolence. Data concerning medical complications were taken from the women's casebooks.Fetal parameters were collected from admission notes.

RESULTS: 33% of cases and 32% of controls reported snoring .Excessive day time somnolence (52%vs 30%%)and obstructive sleep apnoea(28%vs10%)were significantly higher in the cases than in the controls ($p<0.001$).Hypertension developed in 14% of cases, compared with 6% of controls ($p < 0.01$). Preeclampsia occurred in 10% of cases,compared with 4% of controls ($p < 0.05$). An Apgar score < 7 was more common in infants born to cases. Growth retardation of the fetus, defined as small for gestational age at birth, had occurred in 7% of the infants of cases and 3% of the remaining infants in controls.($p < 0.05$).

CONCLUSIONS: Gestational rhinitis is associated with impaired maternal wellbeing and fetal outcome.

KEYWORDS : Pregnancy induced hypertension; intrauterine growth retardation; preeclampsia; ; small for gestational age; snoring;daytime somnolence,obstructive sleep apnoea.

INTRODUCTION

The potential connection between nasal symptoms and the female hormonal cycle was noted as early as the late 18th century (1). Observations of a cyclical change in symptoms related to the menstrual cycle were expanded to include the changes seen during pregnancy. In 1943, a case series of 'vasomotor rhinitis' was presented, where all bar one resolved post partum (2).

A distinction must be drawn between non-specific “rhinitis during pregnancy” and true pregnancy-induced rhinitis. Rhinitis during pregnancy includes all causes of rhinitis such as allergic (3,4), vasomotor rhinitis and rhinitis medicamentosa, which are present before, during and after pregnancy.

Pregnancy Rhinitis/Gestational Rhinitis

Physicians have long consulted with pregnant women who have persistent nasal problems that do not appear to be due to common causes. Eventually,physicians began to question whether this nasal congestion might be due tothe pregnancy itself. The theory was controversial, and, according to one expert, pregnancy rhinitis was “observed as a phenomenon for ages, but until recently not recognized as a defined condition worth being taken seriously.”

Researchers now have defined pregnancy rhinitis as a distinct entity and developed the following diagnostic criteria: “Nasal congestion present during the last six or more weeks of pregnancy without other signs of respiratory tract infection and with no known allergic cause, disappearing completely within two weeks after delivery.”

Pregnancy rhinitis (also known as vasomotor rhinitis of pregnancy) affects as many as 20% of pregnant women. Patients report nasal congestion as the hallmark feature, but they may also experience clear secretions that vary from watery to thick in consistency.

The cause of pregnancy rhinitis is presumed to be the hormonal changes of pregnancy. Estrogen would be a logical cause, as levels increase during pregnancy due to the secretions from the enlarged corpus luteum and the placenta. However, in one study, only 35% of subjects experienced worsening congestion during pregnancy, and 39% actually breathed more easily as the pregnancy proceeded. The roles of progesterone, prolactin,stress, and increased blood volume have been explored, but the true cause of pregnancy rhinitis remains elusive.

Risk factors for pregnancy rhinitis include a history of smoking.Maternal age,parity, and fetal gender are not predictive factors.

Preeclampsia, defined as pregnancy-induced hypertension and proteinuria, frequently combined with edema, is asymptomatic in some women but may induce severe symptoms in others. Hypertensive disorders during pregnancy are a leading cause of maternal death worldwide and are important causes of neonatal morbidity and mortality. The cause of these diseases however, still unknown.

Gislason et al(5) found that snoring was strongly related to hypertension in middle-aged women.

Snoring is a sign of increased upper airway resistance and obstructive sleep apnea, which is associated with arterial hypertension and coronary artery disease.Muscle sympathetic nerve activity and nocturnal norepinephrine levels are elevated in these patients and are considered to be a possible cause of sleep apnea-induced hypertension.

Snoring and sleep apnea are often caused byfactors that narrow the upper airway like gestational rhinitis. Both nasal congestion and pharyngeal edema are such constrictingfactors occurring during pregnancy(6). However,only a few case reports including sleep apnea and complications during pregnancy are available(7-10).

One of these reports relates to a case of intrauterine growth retardation(8) and one describes a womanwith preeclampsia(10) Loube et al(11) reported that snoring frequency increases during pregnancy, but no one has investigated whether gestational rhinitis is associated with hypertensive disorders of pregnancy.

In the present study, we investigated the association of gestational rhinitis with complications of pregnancy and fetal outcome.

MATERIALS AND METHODS

The study was performed at the Department of Obstetrics and Gynecology at North Bengal Medical College ,Darjeeling ,West Bengal between May 2016 and April 2017. 50 ladies who had gestational rhinitis and 50 aged matched controls were taken for the study.On admission each one was asked to fill up a questionnaire.

Questionnaire

When a woman answered the questionnaire she was, as a rule, accompanied by her partner. The questionnaire was administered when she entered the hospital on the day of delivery.. She was also asked about the time during the pregnancy when the symptoms began. The lady was asked about whether she had difficulty in falling asleep and if she suffered from excessive day time sleepiness.

The questions also related to smoking habits, medication, and concomitant disease. Her partner was asked if he had noted apneas during sleep. They were both asked to cooperate on questions of snoring and witnessed sleep apneas.

BP measurements

The BP measurements were recorded in each woman's medical chart. Follow-up BP measurements were recorded more frequently when an increased BP was observed.Proteinuria testing was done using urine dip stick test. Data concerning medicalcomplications were taken from the women's casebooks.

Recordings were obtained from the infants' birth weight, Apgar score at 1 and 5 min after birth. The Apgar score was based on heart rate, respiratory effort, muscle tone, reflex irritability, and skin color(19)Each variable was rated from 0 to 2, where 2 was normal. The maximum Apgar score was 10.

Definitions

Pregnancy-induced hypertension was defined as repeated BP recordings > 140/90 mm Hg appearing during the pregnancy.

Preeclampsia was defined as pregnancy-induced hypertension with proteinuria > 0.3 g/24 h. Growth retardation of the fetus was considered when the infant was small for gestational age according to a birth weight below 2 SDs on the standard chart.

INCLUSION CRITERIA

All pregnant ladies fulfilling the definition of gestational rhinitis along with aged matched controls with no history of IUFD or have delivered a still born baby and willing to participate in the study.

EXCLUSION CRITERIA

All Ladies with other causes of nasal obstruction in pregnancy namely allergic rhinitis,rhinitis medicamentosa.nasal granuloma gravidarum.

Satistical Analysis

The data are presented as rates for nominal values. Differences between proportions were analyzed using the X^2 test.

The null hypothesis was rejected at the 5% level ($p < 0.05$).

RESULTS

Table 1 Maternal outcomes

Characteristics	Gestational Rhinitis Case S(N=50)	Healthy Controls (n=50)	p
Snoring	33(66%)	32(64%)	NS
Excessive Day Time somnolence	26(52%)	15(30%)	<0.001
Obstructive Sleep Apnoea	14(28%)	5(10%)	<0.001
Smoking	9(18%)	6(12%)	NS
Hypertension	7(14%)	3(6%)	<0.01
Preeclampsia	5(10%)	2(4%)	<0.05

Table 2 Fetal outcomes

Characteristics	Gestational Rhinitis Case S(N=50)	Healthy Controls (n=50)	p
Intrauterine growth retardation	7(14%)	3(6%)	<0.05
Apgar score<7 at 1 min	6(12%)	2(4%)	0.001
Apgar score <7 at 5 mn	2(4%)	1(0.5%)	0.01

Snoring

Snoring was found in 33(66%) of cases and 32(64%) of controls which was not significant

Excessive Daytime Sleepiness

Excessive daytime sleepiness was subjectively reported in as many as26(52%) of the cases and15(30%) of the controls which was statistically significant($p < 0.001$) .

Obstructive sleep apnea was 14(28%) among cases and 5(10%)among controlswhich was also statistically significant.Concomitant smoking was found in 9(18%) and 6(12)% of cases and controls respectively.

Preeclampsia and Pregnancy-Induced Hypertension 7(14%) women with gestational rhinitis had pregnancy-induced hypertension ascompared with 3(6%) of controls ($p < 0.01$). 5(10%) of cases met the definitionof preeclampsia with hypertension and proteinuria as compared with 2(4%) of controls ($p < 0.05$).

Infant Outcomes

7(14%)of cases delivered an infant with growth retardation at birth (small for gestational age), compared with 3(6%) of the controls ($p < 0.05$)

An Apgar score < 7 was more common in infants born to cases compared with infants born to controls at 1 and 5 minutes 6(12%) vs 2(4%) (p=0.001)and 2(4%) vs 1(0.5%) (p=0.01)in controls respectively.

DISCUSSION

Pregnancy induced vascular congestion affects nasalmucosa resulting in gestational rhinitis(11,12).

Gestational rhinitis is gaining importance recently with the discovery of its association with SDB i.e sleep related disorders of breathing and OSAS obstructive sleep apnea along with Pregnancy induced hypertension indirectly(13).Snoring anf sleep apnea are as a result of narrowing of the upper respiratory tractby both nasal congestion and pharyngeal oedema(14)

In the present study, gestational rhinitis was related to hypertension, preeclampsia, and also associated withgrowth retardation of the fetus and a low Apgar scorefor the infant.Gestational rhinitis was independently predictive of excessive daytime somnolence and obstructive sleep apnoea. The women answered the questionnaire on the day of delivery in the present study, and not during the second or thirdtrimester as was the case in the study by Loube etal(15) They did not find any effect on the infants, while we found an increased frequency of infants born small for gestational age.

The increased frequency of infants born small for gestational age and low Apgar scores in the infants of mothers with gestational rhinitis is a novel finding. It indicates that the consequences of increased upper airway resistance during sleep may affect the fetus and supports the previously suggested relationship between sleep apnea and intrauterine growth retardation.

The association between gestational rhinitis and pregnancy induced hypertension and preeclampsia is also a novel finding that has not previously been studied. It is not possible to draw any firm conclusions about the cause and effect because of the present study design. This indicates that nocturnal upper airway obstruction may contribute to the development of pregnancy-induced hypertension and preeclampsia. It is possible that pregnant women are especially vulnerable to increases in upper airway resistance, as breathing may also be restricted by an increase in the abdominal pressure affecting the diaphragm. Respiratory sleep studies,including the treatment of sleep apnea in women with preeclampsia, are desirable and may answer the question of whether there is an etiologic link between increased upper airway resistance and preeclampsia.

Apart from snoring, excessive daytime sleepiness is the most common symptom of obstructive sleepapnea. A majority of the present women reported that they had experienced excessive daytime sleepiness during the pregnancy. . Similar to our findings, Loube et al(15)couldnot find any relationship between daytime sleepiness and snoring in pregnant women using the Epworth sleepiness scale. On the contrary, they reported that the Epworth sleepiness score was the same for pregnant and nonpregnant women. Whether or not excessive daytime sleepiness is induced by pregnancy is still unclear. However, it is likely that complaints of daytime fatigue and sleepiness during pregnancy are due to factors other than disturbed sleep due to snoring.

A case report of Sleep apnea and complications of pregnancy are available(16-18).One of these reports relates to acase of IUGR(17) and one describes a female with pre eclampsia(19).Loube et al(15) that snoring frequency increased during peganacy but none of the studies have investigated whether snoring disorder is associated with pregnancy induced hypertension.

Snoring is common in pregnancy and is a sign of pregnancy-induced hypertension. Snoring indicates a risk of growth retardation of the fetus.

LIMITATIONS

- Small sample size
- Confunding factors like BMI and parity
- Subjective reports of snoring
- Under reporting of smoking int his study which is an independent risk factor for Preeclampsia and IUGR.

CONFLICT OF INTEREST: None

CONCLUSION

Preganacy induced Rhinitis or Gestational Rhinitis is a longstanding often neglected entity with undeniable maternal and fetal morbidities which are worth investigating for better management and improved outcomes in the near future.Gestational rhinitis has a profound influence on both maternal and fetal conditions.This calls for both the otorhinolaryngologist and the obstetrician to work hand in hand for early detection of such cases and introducing appropriate therapy for improving maternal and fetal outcome.

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