

Relationship Between Fetal Sex and Nausea and Vomiting of Pregnancy

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Abstract: *Objective:* Nausea and vomiting of pregnancy (NVP) affects approximately 80 % of pregnant women. Its cause remains largely undetermined. The aim of this study was to assess the effect of fetal sex on tendency of NVP. *Method:* A population-based study comparing all singleton pregnancies of patients carrying male and female fetuses was performed in Shahid Sadoughi hospital, Yazd, Iran from May 2010 to April 2011. Data were obtained from maternal self-reported information and prenatal care records during the first visit (<16 weeks of gestation). We get the offspring sex ratio of all births and compared in mother with history of NVP and none. Statistical analysis was performed with the SPSS software and differences were considered significant at P values < 0.05. *Result:* During the study period 2450 deliveries were occurred in our hospital. There were no significant differences between the groups regarding maternal age, gestational age, gravida, education and mother employment. There were 1241 (50.6%) deliveries of male and 1209 (49.4%) deliveries of female gender. NVP was reported by 1862 women (76%) and approximately half of which had been vomiting. The rate of NVP was higher in women with male fetuses than female fetuses (79.5% vs 72.3%). *Conclusion:* Our study showed that women presenting with NVP are more likely to have a male fetus than female.

Key words: Fetal sex • Nausea and vomiting of pregnancy • HCG concentration

INTRODUCTION

Nausea and vomiting of pregnancy (NVP), commonly known as "morning sickness," affects approximately 80 % of pregnant women [1]. NVP commonly occurs between 5 and 18 weeks of pregnancy. Between 50 and 90 percent of women have some degree of nausea, with or without vomiting. This sickness is generally a mild, self-limited condition that may be controlled with conservative measures [2]. A review of evidence-based management of nausea and vomiting in pregnancy found that these discomforts have a profound effect on women's health and quality of life during pregnancy and early recognition and active treatment is warranted because it can be associated with adverse healthy effect in both fetus and mother [3].

The etiology of NVP remains unclear, but many reports have suggested that hormones may cause nausea and vomiting of pregnancy. Rises in human chorionic gonadotropin (HCG) and estrogens are likely contributors, with thyroxin, prostaglandin E2 and prolactin as possible additional contributing factors [4]. Although many physicians were taught that psychological factors are

responsible for NVP [5]. Maternal diseases like hypertension or renal diseases and stress shown to be related to the risk of NVP. Some studies found that presence of NVP is associated with older maternal age, BMI, employment as manual or service workers, maternal smoking and infant gender [6]. Reproductive history including increasing gravidity and having multiple prior miscarriages have also been reported to increase the risk for NVP [7].

Throughout history, people have tried to predict the sex of their offspring. More than 2000 years ago, Hippocrates stated that female fetuses give the mother a pale face, whereas a mother carrying a male fetus has a healthier tone to her skin. Despite efforts to find reliable physical signs or symptoms during pregnancy to indicate the sex of the offspring, none have been found. Some studies reported that pregnant women with a diagnosis of hyperemesis gravidarum in the first trimester give birth to a higher proportion of female newborns than do all mothers.

There is little information on the relation between infant gender and NVP [8, 9, 10]. According to previous studies, it has been suggested that elevated human

chorionic gonadotropin (HCG) is associated with NVP [4]. A fetal sex-related effect on HCG concentration in singleton pregnancies has also been reported. Pregnant women carrying female fetuses have higher HCG levels than women carrying male fetuses.

In this study, we prospectively evaluated association between fetal sex and NVP.

MATERIALS AND METHODS

In a population-based study, we identified all singleton pregnancies that delivered a live born baby between September 2010 and August 2011 in Shahid Sadoughi hospital, Yazd, Iran and had a previous diagnosis of NVP in early of pregnancy.

This study has been approved by the ethic committee of Shahid Sadoughi University of Medical Sciences, Yazd, Iran and all the participants gave written informed consent. The survey results were kept confidential.

Eligible participants included mothers who remembered their prenatal care history and had a normal singleton pregnancy. Exclusion criteria were who had known maternal disease (upper gestational tract disease, vestibular disease, liver disease, or hyperthyroidism), Under 18 years old or more than 40 years' old women and multiple pregnancies.

Data were obtained from maternal self-reported information and prenatal care records during the first visit (<16 weeks of gestation). We get the offspring sex ratio of all births and compared in mother with history of NVP and none.

All analyses were performed with the use of SPSS version 16 statistical software. Chi-square test or Fisher exact test were used for data analysis of qualitative variables and mean values were compared using ANOVA.

Risks were expressed as odds ratios (OR). Ninety-five percentage confidence intervals (95%CI) using Miettinen's method. Differences were considered significant at P values < 0.05.

RESULT

During the study period 2450 deliveries were occurred in our hospital. There were 1241 (50.6%) deliveries of male and 1209 (49.4%) deliveries of female gender. NVP was reported by 1862 women (76%) and approximately half of which had been vomiting. One Thousand five hundred and ten (81%) of NVP had occurred in the first trimester of pregnancy.

Table 1 show that there was no difference in the maternal medical characteristics of both female and male newborns groups.

Totally, the rate of NVP was higher in women with male fetuses than female fetuses [(79.5% vs 72.3%) (P<0.05)] (Table 2). Among women with NVP in the first trimester, the proportion of female fetuses was higher than males.

DISCUSSION

The present study has evaluated the relationship between fetal sex and NVP and the result of study showed an increased proportion of male fetuses among women who have NVP.

For years now, there has been a constant debate about whether or not nausea and vomiting during pregnancy determines baby gender. Many women claim that they experience worse morning sickness when they carry boys, while others claim that their nausea and vomiting was more severe when they carried girls.

Table 1: Comparison of maternal characteristics with NVP based on fetal sex

	Male n =1241	Female n =1209	P.Value
Maternal age in year: Mean ± SD	24.4 ± 5.8	25.4 ± 6.1	0.3
Gestational age in week: Mean± SD	38.9 ± 1.5	38.2 ± 1.1	0.2
Mother employment			
Yes [N (%)]	664 (53.8)	601(49.7)	0.08
No [N (%)]	573(46.2)	608(50.3)	
Gravida			
Primigravida [N (%)]	411(33.1)	435 (36)	0.06
Multigravida [N (%)]	830 (66.9)	774 (64)	
Education in years			
<12 [N (%)]	214(17.2)	203(16.8)	0.08
12 - 16 [N (%)]	589 (47.5)	608(50.3)	
>16 [N (%)]	438(35.3)	398(32.9)	

Table 2: Proportion of fetal sex in Women with NVP Compared with all Births

	Male n =1241	Female n =1209	P value
All births 2450			
NVP [N(%)]	987 (79.5)	874 (72.3)	0.03
Vomiting [N(%)]	451 (39.9)	482 (39.2)	0.01

The investigators suggest that raised concentration of human chorionic gonadotropin (HCG) is associated with hyperemesis gravidarum [11]. In normal pregnancies female fetuses are associated with higher HCG concentrations at birth than male fetuses. It has been suggested that maternal serum human chorionic gonadotropin (HCG) levels are influenced by the sex of the fetus and specifically that HCG concentrations in maternal blood and placenta tissues are higher when the fetus is female [9]. Contritely in our study, there were more female fetuses in the first NVP but generally there were more male fetus in NVP. Studies have suggested that offspring of women hospitalized for hyperemesis gravidarum have a different sex ratio than those of women without this diagnosis, but little is known of the potential association between fetal gender and NVP [8, 12]. Recent studies reported that women presenting with morning sickness are more likely to give birth girls than boys [13, 14]. He has considered morning sickness is a sickness of first trimester of pregnancy. It is similar to our study.

CONCLUSION

Our findings provide evidence that pregnant women with a diagnosis of NVP in the first trimester give birth to a higher proportion of male newborns than do all mothers.

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