Original article

He or She, What Will It Be: Old Wives' Tales and Foetal Sex Prediction

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Abstract

Aim: A myriad of myths surround pregnancy, especially regarding the prediction of the sex of the infant. Some of these myths and old wives' tales are, to this day, widespread among expectant parents. The objective of this study was to examine whether common pregnancy-related statements regarding foetal sex prediction vary between mothers of female and male infants.

Methods: The questionnaire-based study was conducted from September 2017 to September 2018 at a well-baby nursery. Participants were mothers of infants (n = 350) admitted to the well-baby nursery with a singleton pregnancy and at > 36 weeks of gestation at birth.

Results: We investigated a number of statements regarding foetal sex prediction. With the exception of one statement, there were no other differences between mothers of male and female infants. Pregnancy with a male foetus is associated with glossier hair during pregnancy. Women with female newborns reported glossier hair during pregnancy in 39.1% of cases, while women with male newborns reported the same in 45.0% of cases (P = 0.04).

Conclusion: Old wives' tales regarding sex prediction of the infant during pregnancy remain myths for a reason, with the possible exception of one statement regarding glossier hair and pregnancy with a male foetus.

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Introduction

Since the beginning of recorded history, people have been continuously fascinated with pregnancy. Pregnancy is possibly associated with more myths and folklore tales than any other human condition and this fascination exists even today. A myriad of myths surround pregnancy, especially regarding prediction of the sex of the infant. Since ancient times, several tell-tale signs have been associated with the birth of a male or a female child. Hippocrates states that "women beget females if they have rough spots on the face; those who keep a good complexion beget males" (1). Some of these myths and old wives' tales are, to this day, widespread among expectant parents. The aim of this study was to examine whether common and widespread pregnancy-related statements regarding foetal sex prediction vary between mothers of female and male infants.

Methods

To investigate the popular myths regarding foetal sex prediction in pregnancy, we surveyed 350 mothers of singleton newborn infants with gestational age > 36 weeks, who were admitted to a well-baby nursery at the Department of Gynaecology and Obstetrics at University Hospital Centre Osijek, Croatia from September 2017 to September 2018. The study protocol was approved by the UHC Osijek Ethics Committee.

A questionnaire was administered to mothers of newborn infants and data on eleven common pregnancy myths were collected. In addition, they were asked two questions aimed to determine the link between maternal heartburn intensity and their perception of the infant's hair density, and one question regarding the maternal sentiment about the sex of the infants at the time they found out that they were pregnant.

Statistical anaylsis

Data were described by using descriptive statistical methods. The Chi-squared test was used to analyse the differences between proportions compare samples. All p values are two-sided. Level of significance is set at Alpha = 0.05. Statistical analysis was performed by using the statistical program MedCalc Statistical Software version 18.9 (MedCalc Software bvba, Ostend, Belgium; http://www.medcalc.org; 2018).

Results

A total of 350 women responded to the questionnaire: 179 of them were mothers of female infants and 171 of male infants. The results are shown in Table 1.

Table 1. Common pregnancy myths

Statement	Number (%) according to sex of the infant			P
	Female (n=179)	Male (n=171)	Total	
During the pregnancy, I carried the baby:				
"High"	103 (57.5)	86 (50.3)	189 (54)	0.17
"Low"	76 (42.5)	85 (49.7)	161 (46)	
During the pregnancy, my facial complexion was:				
Poorer than before	39 (21.8)	27 (15.8)	66 (18.9)	0.15
Unchanged or better than before	140 (78.2)	144 (84.2)	284 (81.1)	
During the pregnancy, I had:				
Mild or no morning sickness	124 (69.3)	120 (70.2)	244 (69.7)	0.85
Strong morning sickness	55 (30.7)	51 (29.8)	106 (30.3)	
During the pregnancy, I had:				
Mildly or moderately increased appetite	115 (64.2)	125 (73.1)	240 (68.6)	0.08
Markedly increased appetite	64 (35.8)	46 (26.9)	110 (31.4)	
During the pregnancy, I craved mostly on:				
Sweet foods	87 (48.6)	85 (49.7)	172 (49.1)	0.84
Salty foods	92 (51.4)	86 (50.3)	178 (50.9)	
At the end of the pregnancy, my belly had the shape of:				
A watermelon	92 (51.4)	80 (46.8)	172 (49.1)	0.39
A soccer ball	87 (48.6)	91 (53.2)	178 (50.9)	
During the pregnancy, I had wild mood swings, I was occasionally sad and of lower mood:				
No	83 (46.4)	78 (45.6)	161 (46)	0.89
Yes	96 (53.6)	93 (54.4)	189 (54)	
At the end of the pregnancy, I mostly woke up on my:				
Right side of the body	71 (39.7)	56 (32.7)	127 (36.3)	0.18
Left side of the body	108 (60.3)	115 (67.3)	223 (63.7)	
During the pregnancy, my hair was:				
The same as before the pregnancy	118 (65.9)	94 (55)	212 (60.6)	**0.04**
Glossier than before	61 (34.1)	77 (45)	138 (39.4)	
During the pregnancy, I gained more weight:				
On the central part of my body	104 (58.1)	93 (54.4)	197 (56.3)	0.52
On the hips and backside	75 (41.9)	78 (45.6)	153 (43.7)	
During the pregnancy, my partner:				
Gained weight	63 (35.2)	57 (33.3)	120 (34.3)	0.71
Stayed the same weight	116 (64.8)	114 (66.7)	230 (65.7)	
TOTAL	179 (100)	171 (100)	350 (100)	

*Chi-square test

We found no statistical significance between 10 popular statements regarding sex prediction during pregnancy. The only exception was a myth that states that a pregnancy with a male foetus is associated with glossy hair during pregnancy. In the group of women with female foetuses, 39.1% of them reported glossier hair during pregnancy, while in the group of women with male foetuses, 45.0% of them reported the same. The difference is significant (P = 0.04). With regard to the correlation between hair volume and heartburn intensity, 205 women described that their newborn has "a lot of hair" and 145 women described that their newborn has "scarce or no hair". Mothers of infants with a lot of hair reported severe heartburn in 45.9% of cases and those with "scarce or no hair" reported severe heartburn in 34.5% of cases (P = 0.03). Mothers accurately predicted the sex of the infant at the time they first found out that they were pregnant in 60% of the cases (57.5 % in cases of female pregnancy and 62.6% in cases of male pregnancy).

Discussion

Since the first artistic depictions of the human figure in history, a collection known as Venus figurines, some of which are perceived as representations of pregnant women (2), we have been witnesses of the continuing fascination with pregnancy. This interest in pregnancy has not diminished even today, which is clearly reflected in the fact that a Google search of the term "foetal sex prediction myths" yields more than 14 million search results.

There have been several studies conducted in an attempt to validate some of the folklore tales and myths surrounding pregnancy. Hsu et al (3) found that women with severe hyperemesis gravidarum were more likely to have female foetuses. The authors propose a mechanism of action in which hyperemesis gravidarum is caused by the female foetal effect on hCG concentrations. This finding was first reported by Schoeneck et al (4). They found that the concentration of gonadotropic hormone in the urine of pregnant patients who present symptoms of nausea and vomiting was increased, compared to pregnant patients who are free from these symptoms. Later studies confirmed these findings (5-7).

Another common myth is that severe morning sickness is associated with female sex of the foetus. In our study, we found that severe morning sickness was found in 30.7% of women with female foetuses and in 29.8% of women with male foetuses. The difference was not statistically significant, but some studies have so far reported that women presenting with morning sickness in the first trimester are more likely to give birth to a female infant (8, 9).

It is a common myth that cravings for sweet food are associated with pregnancies with female foetuses. A similar number of pregnant women with both male (49.7%) and female (48.6%) infants craved sweet food. This difference is not significant. The shape of the belly, carrying the baby "low" or "high" and distribution of additional weight gain during pregnancy were not statistically significant in pregnancies with female and male foetuses.

Perry et al (10) investigated some beliefs associated with predicting foetal sex (e.g., whether a woman is carrying her foetus in front or across the hips, prevalence of morning sickness) and concluded that these were ineffective. Ostler et al. (11) investigated the predictive value of three common pregnancy myths (foetal heart rate test, the Chinese calendar test, and the Draino test) and found that these tests had no value in terms of sex prediction.

Among other myths, we investigated a common myth stating that if the partner of an expectant mother gained weight (the so-called "chubby hubby" test), that this is indicative of a pregnancy with a female foetus. Interestingly, 34.3% of male partners of expectant mothers gained weight. However, no statistical difference was found in mothers of male or female infants.

Of the 11 investigated myths, the only myth that produced a significant difference between mothers of male and female infants is the one stating that mothers of male infants report higher incidences of glossy hair during

pregnancy (45%), compared to mothers of female infants (34.1%). It is challenging to propose a physiological process, but some researchers have suggested that testosterone has a positive anabolic effect on hair growth (12), and some researchers reported higher maternal peripheral testosterone levels during the first half of the pregnancy in mothers with male foetuses (13).

Regarding the connection between infants' hair density and incidence and duration of morning sickness, some interesting results were obtained through our study. We found that women who describe their infant as having "a lot of hair" reported severe heartburn in 45.9% of cases and those with "scarce or no hair" reported severe heartburn in 34.5% of cases. The difference is statistically significant (P = 0.03). Surprisingly, this finding is consistent with Costigan et al (14) who reported a simple linear relationship between maternal heartburn severity and infants' hair volume. In addition, they have found that women who reported moderate or severe heartburn gave birth to babies with average or above average amounts of hair. Conversely, most women reporting no heartburn had babies with less than average or no hair. The authors hypothesize that individual variations in pregnancy hormone levels that have been implicated in the relaxation of the lower oesophageal sphincter and resultant reflux are also independently associated with hair growth of the foetus (14).

We found that the most common pregnancy myths had no empirically validated results. However, an interesting relationship was found between maternal heartburn intensity and maternal perception of the infant's hair density. Also, we found statistically significant results related to the myth stating that mothers with male infants reported glossier hair during pregnancy.

The main limitation of this study is that the mothers' perception related to some of the statements that were made could be attributed to the fact that these statements were examined after the sex of the newborn was already known. Consequently, in retrospect, some claims could be reinforced and others discarded (e.g. heartburn intensity, shape of the belly, etc.).

We hope that the results of this study will not diminish the enthusiasm of expectant parents related to common pregnancy myths regarding sex prediction of the foetus, especially since pregnancy folklore tales and myths play an important part in the lives of expectant parents.

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Disclosure

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Competing interests. None to declare.

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