

# Preterm Labor In An Iranian Population And Gender Variations In Affected Pregnancies

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## Abstract

The aim of this study was to assess the characteristics related with preterm labor in an Iranian population and possible effect gender in this regard. In this study 140 pregnant women with preterm labor were enrolled. Both maternity and neonatal variables were measured. Data were entered into the computer and analyzed using stata 11 statistical software package. Mean gestational age was  $33.9(\pm 1.7)$  weeks and the median gestational age was 34 weeks. Gestational age had a weak positive correlation with age. The male gender proportion was higher than the worldwide sex ratio at birth. Male neonates had statistically significant difference in some health related characteristics after controlling for mother's age, gestational age, birth weight and gravid. The results of this study indicate better health related indices for girls even among those with a preterm labor and independent of some maternity characteristics.

## INTRODUCTION

Disorders due to prematurity are among the leading causes of infant mortality(1). Preterm birth is a major cause of infant mortality and lifelong morbidity and it remains as a major problem in pregnancy irrespective of the amount of advances made in medical science. Preterm infants suffer from both acute and chronic respiratory failure impairments in lung function, lung pathologies, and nutritional deficiencies(2).

The causes and variations in preterm labor is well investigated by the researchers in high-income countries while it is a major problem in low and middle income countries. A racial disparity is seen in preterm birth possibly due to genetic and environmental factors(3). So it seems also necessary to a worldwide contribution of research findings especially from developing countries that have lower share of scientific contribution in this regard.

Gender differences in health has always been a source of great interest for medical investigations most of those conducted after birth and less in pregnancy research and least in preterm studies. The research assessing gender differences in incidence of preterm labor or its variation among preterm pregnancies can be beneficial for researchers and clinicians especially in developing countries. The aim of this study was to assess the characteristics related with preterm labor in an Iranian population and possible effect

gender in this regard.

## METHODS

This cross-sectional study was conducted in 2010 in Tabriz, north-west of Iran. The preterm labor cases hospitalized in Alzahra University hospital were asked to participate and informed consent was obtained if they agreed. Alzahra University hospital is a specialty hospital in Tabriz receiving patients from both Tabriz district and other districts of Eastern Azerbaijan province in north-west of Iran. In this study 140 pregnant women were enrolled. To prevent clustering effect, in case of twin pregnancies only one neonate was chosen to be studied on a random number selection strategy. The gestational age was determined based on LMP and in case of uncertainty, ultrasonography investigation was used. Neonatal weight was measured according to the standards and using a reliable digital device. Two skillful obstetricians did the physical examinations and collected the clinical data.

Data were entered into the computer and analyzed using stata 11 statistical software package. Descriptive statistics were produced for study variable and suitable graphs plotted. After primary bivariate analysis using ttest and chi-squared test, multivariate analysis was used to control possible role of confounders investigating the gender effect.

Study protocol was approved by committee of ethics in

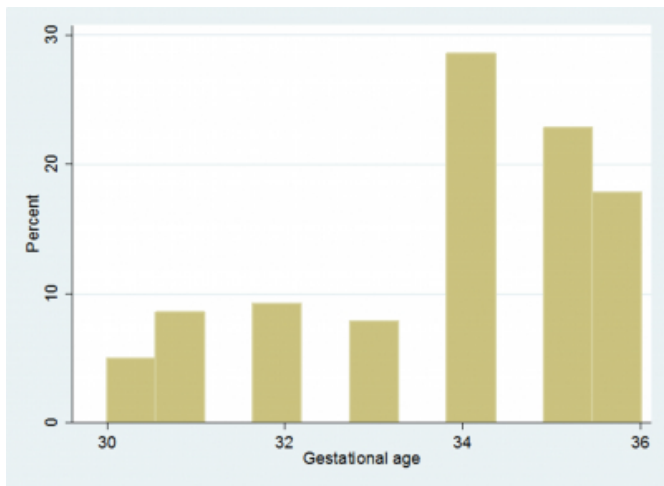
Tabriz University of medical sciences.

**RESULTS**

Mean age of the participants was 23.7(± 5.2) years. Mean gestational age was 33.9(±1.7) weeks and the median gestational age was 34 weeks. Gestational age had a weak positive correlation with age (r=0.19, P <0.05). Figure 1 shows the distribution of gestational age ranging from 30-36 weeks. Twelve deliveries were done by cesarean section, while more than 90% of the deliveries were vaginal. Premature rupture of membranes was observed in 52(37.1%) of the preterm labors.

**Figure 1**

Figure 1: Histogram of gestational age among pregnant women with preterm labor, Tabriz, Iran

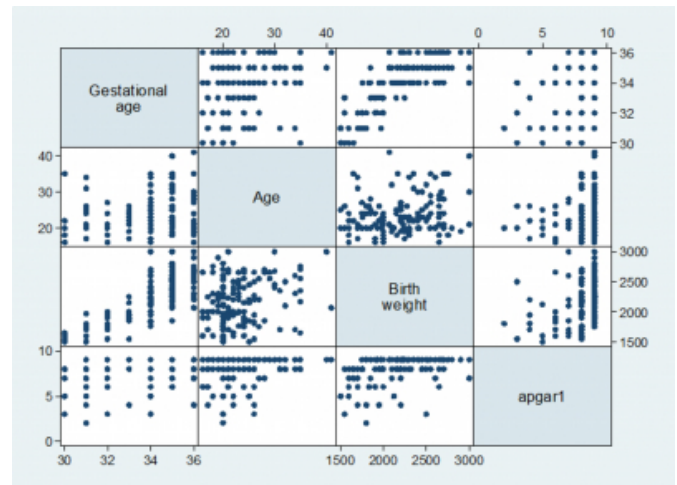


Regarding the product of the pregnancy, 58.6 percent of the women gave birth to a male neonate. The proportion was higher than the worldwide sex ratio at birth. Mean birth weight was 2.2 kg with a standard deviation of 381 grams. Birth weight under 2000 gr was observed in 30% but no birth weight under 1500 gr was observed among the participants. Mean and median Apgar scores at the first minute were 7.9 and 9 respectively. Mean and median of the 5-minute Apgar scores were 9.3 and 10 respectively. About 10% of the neonates had Apgar score of five or lower at first minute and three percent at five minute. Thirty-eight percent received corticosteroid therapy. Sixty neonates needed hospitalization.

The correlation among two maternal variables (Age & gestational age) and two neonate related variables (Birth weight & 1-minute Apgar) are presented as scatter plots in figure 2.

**Figure 2**

Figure 2



Some health characteristics of the preterm labors compared between male and female neonates are given in table 1.

**Figure 3**

Table 1: Some health characteristics in preterm labor compared between male and female neonates

Characteristic	Male	Female	P Value
Age: Mean(SD), years	24.1(0.6)	23(0.6)	0.2
Gravid: Mean(SD)	1.5(0.1)	1.6(0.1)	0.7
Gestational age: Mean(SD), weeks	33.7(0.19)	34.1(0.21)	0.1
Birth weight	2.2(0.04)	2.2(0.05)	0.5
Apgar 1: Mean(SD)	7.7(0.2)	8.3(0.15)	0.01
Apgar 5: Mean(SD)	9.1(0.16)	9.6(0.11)	0.02
No corticosteroid therapy	27.6%	47.6%	0.02
Neonate hospitalization	31.1%	51.2%	0.02
PROM	29.3%	42.7%	0.1

Using multivariate analysis it was found that gender effect found in bivariate analysis holds even after controlling for age, gestational age, gravid and birth weight.

**DISCUSSION**

In this study male gender had a higher proportion when compared to gender ratio in normal pregnancies. This was consistent with previous studies showing slightly higher male proportion of male sex in preterm labor(4-6). It has also been shown this may not be the sole disadvantage of male gender in pregnancy. Higher likelihood of miscarriage, congenital malformations, cesarean section birth, and needing to be resuscitated are other known disadvantages of being a male fetus(7,8).

Rachel et al. showed that male sex is a risk factor only for spontaneous preterm birth and it was not found to be a risk for iatrogenic preterm birth(9). Our study didn't find a statistically significant difference between gender and type of delivery in preterm labor. But it should be taken into account that it was not large enough to fulfill adequate

statistical power of study in testing the hypothesis not being considered as the aim of investigation either. The reverse correlation between mother's age and preterm labor is known in literature, but our results show that this reverse correlation exists between age and lower gestational age at birth even when compared among those already having preterm labor.

One theory in explaining the association between male gender and preterm labor can be declared as male fetus is larger or in higher likelihood of infection. Brettell et al. have found that this hypothesis can be seriously questioned knowing that it is a risk in spontaneous preterm labor(5). They have concluded that the observed male excess in preterm labor cannot be attributed to either larger birth weight of the males or their higher risk of antenatal complications and infection. Similarly in our study although all participants had preterm labor, and mother's age, gestational age and birth weight didn't differ for fetal gender, but the female gender had better health situation. The logic by Brettell et al. seems acceptable and is also consistent with our findings but further research is needed to investigate it precisely. Genetic, environmental and hormonal factors need also to be investigated and adjusted in clarifying the association between gender variations and preterm labor. Another focus recommended for future research can be assessing possible interactions of male sex with these factors.

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