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Research Article

# Unfavourable Foetal Pregnancy Outcomes among Primigravida Women in Erbil City of Iraq

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**Abstract**

**Background and Objectives:** Pregnancy carries certain health risks for both the women and the infant she bears. This study was done to measure the rates of certain unfavourable foetal pregnancy outcomes among primigravidae and to determine their association with maternal socio-demographic characteristics, pregnancy risk factors and with antenatal care services.

**Methods:** This cross-sectional study was done on 400 primigravidae women at the labour room of the maternity teaching hospital in Erbil city. Data were collected about three main unfavourable fetal pregnancy outcomes: low birth weight, stillbirth, and preterm delivery. Data collection was carried out through direct interview with women using especially designed questionnaire.

**Results:** The rates of the low birth weight, stillbirth, and preterm delivery were: 5.9%, 1.8%, and 8.8%, respectively. Low birth weight was associated with lower maternal education (P=0.009), increased psychosocial stress (P=0.023), lower number of antenatal care visits (P<0.001), late first antenatal care visit (P=0.015), ferrofolic supplementation (P=0.011), anaemia (P<0.001), and lower gestational age (P<0.001). Stillbirth was associated with lower number of antenatal care visits (P=0.005) and lower gestational age (P<0.001). Preterm delivery was associated with increased psychosocial stress (P=0.006), lower number of antenatal care visits (P<0.001), anaemia (P=0.001) and low birth weight (P<0.001).

**Conclusion:** The rates of unfavourable foetal pregnancy outcomes in primigravida women are within the range of those reported in other parts of Iraq and neighboring countries, with inconsistency in the risk factors associated with various unfavourable foetal pregnancy outcomes.

## Introduction

Pregnancy outcome as a measure of the health status of both the infant and mother is influenced by several factors, which may include poor nutrition of the women, child spacing, maternal age (less than 15 years and over 35 years) and inadequate prenatal care [1]. Other factors include life behaviours (e.g. smoking, alcohol consumption, drug abuse and unsafe sex), overweight, obesity and poverty [2,3].

Primiparity has been found to be associated with significantly higher incidence of adverse pregnancy foetal and maternal outcomes in several studies [4-6]. Studying of the association of certain independent factors including socio-demographic characteristics of pregnant women, pregnancy risk factors and Antenatal Care (ANC) services with the occurrence of adverse pregnancy outcomes in primigravidae is, therefore, of extreme importance in early detection and prevention of such undesirable adverse pregnancy outcomes among pregnant women. Unfortunately, no sufficient attention has been given to this aspect of women's health and no published study has tackled the problem in Erbil city.

The purpose of this study was to measure the rates of the main unfavourable fetal outcomes among a sample of primigravida women and determine their association with maternal socio-demographic characteristics and pregnancy risk factors and with provision of ANC services.

## Patients and Methods

A cross-sectional study was conducted at the maternity teaching hospital in Erbil city, the capital of Kurdistan region of Iraq, between 1st of July, 2015 and 30th of June, 2016. A convenience sample of 400 primigravida women was collected. Primigravida women more than 24 weeks of gestational age attending the labour room during the study period were included in the study. Women with chronic disease like diabetes mellitus, hypertension, bronchial asthma, renal disease, cardiovascular disease and women had multiple pregnancy or pre-eclampsia were excluded.

A detailed structured especially designed questionnaire was used to obtain relevant data. Data were obtained from primigravida women by direct interview in the labour room or post labour wards of hospital. A detailed history was obtained from each women together with physical examination. Blood samples were sent for Hb level. Ultrasound was used to ensure viability of the foetus, and gestational age.

Pregnancy foetal outcomes such as preterm (babies born before the end of 37 weeks gestation) [7], LBW (live infant weighting < 2500 g at birth) [8], stillbirth (any fetus born with no sign of life after 24 weeks of gestation) [9] were taken as dependent variables. The study comprises a set of independent variables including age and




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**Table 1:** Main unfavourable pregnancy foetal outcomes among study sample (n=400).

| Unfavourable pregnancy foetal outcomes | No. (%) |
|---|---|
| Low birth weight* | 23 (5.9) |
| Stillbirth | 7 (1.8) |
| Preterm delivery ( <37 weeks) | 35 (8.8) |

*Stillbirths (n=7) were excluded from calculation.

educational level of mother, psychosocial stress, and ANC, anemia and ferrofolic supplementation during current pregnancy.

The study was approved by the research ethics committee of the scientific board of community medicine of the Arab Board of Health Specializations, and a written informed consent was obtained from each woman before being enrolled in the study.

Statistical analysis was performed using the SPSS software version 21. Chi-square analysis test and Fisher's exact test were used for categorical data and t-test for continuous data analysis. P-value of ≤ 0.05 was considered statistically significant. Regression analysis was performed also.

## Results

The age range of women included in the study was 15-37 years, with a mean ± SD of 22.55 ± 4.37; the rate of elderly (≥ 35 years) primigravidae was 3.3%. ANC visits was reported by 390 (97.5%) of primigravida women, 180 (46.2%) of them during the 1st trimester. Anaemia was detected in 108 (27%) of women.

The main unfavourable foetal pregnancy outcomes were LBW (5.9 %), stillbirth (1.8%) and preterm delivery (8.8%) as shown in Table 1. Higher proportions, although not statistically significant, of LBW, stillbirth and preterm delivery was demonstrated among elderly (≥ 35 years) primigravidae (8.3%, 7.7%, 15.4%, respectively).

LBW was associated with maternal education (P=0.009), psychosocial stress (P=0.023), number of ANC visits (P<0.001), time of first ANC visit (P=0.015), ferrofolic supplementation (P=0.011) and anaemia (P<0.001). Stillbirth was associated with number of ANC visit (P=0.005) only, while preterm delivery was associated with psychosocial stress (P=0.006), number of ANC visits (P<0.001) and anaemia (P<0.001). Details are shown in Table 2.

Regression analysis of LBW rates with age revealed a significant (P<0.001) strong inverse linear relationships (r=-0.88) between the two variables. Regression analysis of stillbirth rates with gestational age at delivery, revealed also, a significant (P<0.001) strong inverse linear relationships (r=-0.79) between the two variables. Regression lines are shown in Figures 1 and 2.

**Table 2:** Association of foetal outcomes with certain socio-demographic characteristic, ANC and pregnancy risk factors.

| Foetal outcomes | | | | | | |
|---|---|---|---|---|---|---|
| **Variables** | **LBW*** | | **Stillbirth** | | **Preterm** | |
| Maternal age (years) | | | | | | |
| ≤ 20 | 61 | 5(8.2) | 62 | 1(1.6) | 62 | 5(8.1) |
| 20-34 | 320 | 17(5.3) | 325 | 5(1.5) | 325 | 28 (8.6) |
| ≥ 35 | 12 | 1(8.3) | 13 | 1(7.7) | 13 | 2(15.4) |
| P -value | | 0.4000 | | 0.275 | | 0.684 |
| Mother education level | | | | | | |
| Illiterate & primary school education | 126 | 14(11.1) | 129 | 3(2.3) | 129 | 17(13.2) |
| Intermediate & secondary education | 189 | 6(3.2) | 191 | 2(1.0) | 191 | 13(6.8) |
| Higher education** | 78 | 3(3.8) | 80 | 2(2.5) | 80 | 5(6.3) |
| P-value | | 0.009 | | 0.546 | | 0.095 |
| Psychosocial stress | | | | | | |
| Yes | 41 | 6(14.6) | 42 | 1(2.4) | 42 | 9(21.4) |
| No | 352 | 17(4.8) | 358 | 6(1.7) | 358 | 26(7.3) |
| P-value | | 0.023 | | 0.543 | | 0.006 |
| Number of ANC visits (n=390) | | | | | | |
| < 4 | 113 | 16(14.2) | 119 | 6(5.0) | 119 | 20(16.8) |
| ≥4 | 270 | 7(2.6) | 271 | 1(0.4) | 271 | 15(5.5) |
| P-value | | < 0.001 | | 0.005 | | < 0.001 |
| Time of first ANC visit (n=390) | | | | | | |
| 1st trimester | 176 | 4(2.3) | 180 | 4(2.2) | 180 | 16(8.9) |
| 2nd trimester | 168 | 16(9.5) | 171 | 3(1.8) | 171 | 17(9.9) |
| 3rd trimester | 39 | 2(5.1) | 39 | 0(0.0) | 39 | 2(5.1) |
| P-value | | 0.015 | | 1.000 | | 0.636 |
| Ferrofolic supplementation | | | | | | |
| Yes | 347 | 16(4.6) | 353 | 6(1.7) | 353 | 29(8.2) |
| No | 46 | 7(15.2) | 47 | 1(2.1) | 47 | 6(12.8) |
| P-value | | 0.011 | | 0.586 | | 0.278 |
| Anemia | | | | | | |
| Yes ( <11g/dl) | 104 | 14(13.5) | 108 | 4(3.7) | 108 | 18(16.7) |
| No | 289 | 9(3.1) | 292 | 3(1.0) | 292 | 17(5.8) |
| P-value | | <0.001 | | 0.089 | | <0.001 |
| Total | 393 | 23(5.9) | 400 | 7(1.8) | 400 | 35(8.8) |

*Stillbirths (N=7) were excluded from calculation
**Diploma, B.Sc. and postgraduate degrees.

## Discussion

### Low birth weight

The LBW rate of 5.9% revealed by this study is much lower than that reported among primigravidae in Basrah of Iraq, 13.4% [10]. Significant variations in the incidence of LBW between developed and developing countries and even between various regions of the same country was reported. In developed countries, the occurrence is 7%, while in developing countries it is 15% [11]. Globally, recent estimates suggest that 18 million LBW babies are born every year [12]. This very low rate in Erbil in 2016 could be attributed to better economic growth [13] and relatively better status of health infrastructure and health services [14] in Kurdistan region of Iraq. Unlike the rest of Iraq, Kurdistan region has been relatively stable from 2003 onwards and has experienced significant economic progress [14]. Other factors might include sampling techniques and age structure of the sample.

The significant inverse relationship between education and LBW revealed by this study is in agreement with finding of other studies [15-17]. Lower socio-economic status and educational status lead to lower health consciousness, nutritional status and antenatal

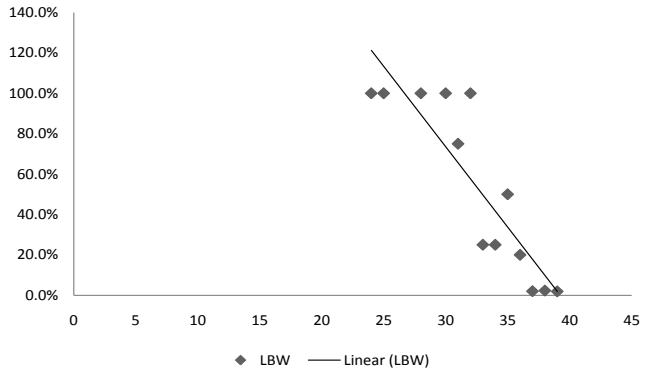


**Figure 1**: Regression line drawn on scatter diagram relating LBW and gestational age (y= -0.0795x+ 3.120, r=-0.88, P<0.001).

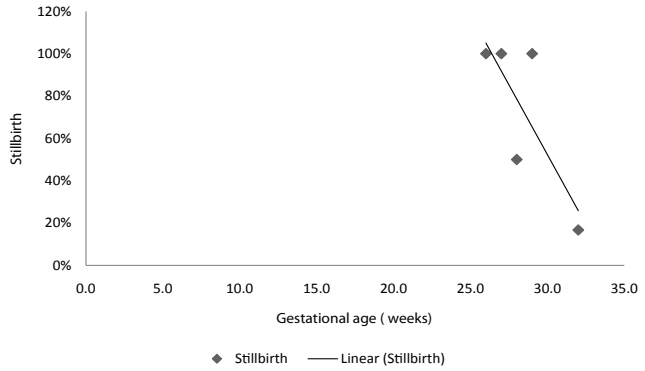


**Figure 2:** Regression line drawn on scatter diagram relating stillbirth and gestational age ( y=-0.132x+4.4827, r=-0.79, P<0.001).

attendance, leading ultimately to the increased risk of LBW babies [16,17]. LBW was significantly associated with exposure of mothers to psychosocial stress during pregnancy; a finding which is similarly reported by other studies [18,19]. Babies born to mothers with low social support during early pregnancy were reported to be smaller and had markedly reduced birth weight by 200 g on average [19].

The rate of LBW was significantly higher among primigravidae with low number (< 4) of ANC visits, which is similar to the finding of a cross-sectional study in the Islamic Republic of Iran [20]. On the other hand early ANC visit in the 1st trimester was significantly associated with lower rate of LBW. Early entry to ANC is important for early detection and treatment of adverse pregnancy related outcomes. The WHO recommends pregnant women in developing countries to seek ANC within the first 4 months of pregnancy [21]. However, in this study only 46.2% of women reported seeking ANC during 1st trimester. A study in Ghana reported a better infant birth weight and Hb concentration among pregnant women who received early ANC [1].

Provision of iron supplementation to pregnant women is one of the most widely practiced public health measures; the WHO guidelines recommend provision of a daily prophylactic oral dose of iron (30-60 mg) and folic acid (400µg) to all pregnant women, starting as early as possible during pregnancy [22]. Ferrofolic supplementation in this study was significantly associated with lower incidence of LBW, which agrees with the results of two randomized controlled trials in rural Nepal [23], and Cleveland in the USA [24]. Iron/folic acid supplementation during pregnancy has a preventive effect on neonatal and childhood mortality [25].

Anaemia is one of the most commonly encountered medical disorders during pregnancy. In this study it is encountered in 27% of women. The significant association between LBW and anaemia is in agreement with findings of other studies in Pakistan [26] and Syria [27]. A study on Chinese pregnant women, showed that in women with iron deficiency anaemia the mean weight of their infants was 242 g less [28].

Preterm birth is consistently associated with LBW, as revealed by studies in Duhok [29], Sulaimaniyah [30], and Diyala of Iraq [31], and in Taif region of Saudi Arabia [32], Tehran of Iran [33] and Hyderabad of Pakistan [34].

## Stillbirth

In the present study, the rate of stillbirths of 18 per 1000 total births is slightly less than that reported in Erbil city in 2011, 20.4 per 1000 total births [35]. According to the WHO, the incidence of stillbirth was 9 in Iraq, 13 in Jordan, 13 in Egypt and 8 per 1000 in Saudi Arabia in 2013 [36]. Worldwide, for every 1000 total births in 2015, 18.4 babies were stillborn, mostly in low-and middle-income countries [37].

Primiparity contributes to around 15% of stillbirths in high income countries [38]. The high rate of stillbirth in the present study in comparison with that of Iraq and neighboring countries [27], could be attributed to the relatively high proportion of women with low number of ANC visits. The significant association between stillbirth and low number of ANC visits (< 4), is similarly reported in North Bengal [39], Jordan [40] and Northern Iran [41]. Stillbirth was inversely associated with lower mean gestational age; it was significantly decreasing with increase in gestational age indicating that stillbirths mostly occur before delivery. This finding agrees with those of studies conducted in Pakistan [42], Nepal [43] and Tunisia [44].

## Preterm delivery

The rate of preterm birth of 8.8% is similar to that reported in primigravidae in Bangladesh (9.0%) [45], and Tunisia (8.9%) [46]. It is slightly higher than that reported in Egypt (7.3%) and Algeria (7.4 %), and higher than that in western countries like Italy (6.5%) and France (6.7%) [46].

Although the psychosocial stress is a subjective variable as primipara women are necessarily under major physical and psychological stress since the beginning of their pregnancy, this study revealed a significant association of preterm delivery with the psychosocial stress. It is worth to mention that 25 out of the 42 participants who reported psychosocial stress were Iraqi displaced persons and Syrian refugees. This finding is in agreement with finding of a cross-sectional study conducted on 896 German women in Berlin, between 2002 and 2004, where emotional distress, and anxiety, reportedly increased the risk of pregnancy and birth complications, poor neonatal status, LBW, prematurity and IUGR [47]. In Denmark, psychological distress late in pregnancy was associated with an

increased risk of preterm delivery [48].

In the current study, a statistically significant inverse association between preterm delivery and lower number of ANC visits (< 4) was demonstrated but not with the timing of first visit. However, a hospital-based cross-sectional study in Cameroon revealed a strong negative correlation between gestational age at start of ANC and overall adequate care [49]. A randomized trial in UK has indicated also that reducing the number of antenatal visits does not affect overall outcome [50]. The statistically significant association of preterm delivery with anaemia is in agreement with the findings of a cohort study in Pakistan, which revealed that mothers with anaemia had higher risk of LBW, preterm delivery, intrauterine foetal death, lower Apgar score , and asphyxia [51]. In Nepal, a meta-analysis revealed that anaemia in early pregnancy only was associated with slightly increased risk of preterm delivery and LBW [52]. However, other studies revealed no association [53,54].

## Conclusion

The rates of unfavourable foetal pregnancy outcomes in primigravidae women are within the range of those reported in other parts of Iraq and neighboring countries. There is inconsistency in the risk factors associated with unfavourable foetal pregnancy outcomes. In general primigravidae with lower maternal education, increased psychosocial stress, inadequate ANC visits (number and timing), inadequate ferrofolic supplementation, anaemia and lower gestational age had a higher risk for unfavourable foetal pregnancy outcomes.

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