Occupational, Environmental and Lifestyle factors associated with spontaneous miscarriage in Kirkuk city

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Abstract

Background: Spontaneous miscarriage is the unintentional expulsion of an embryo or fetus before the 24th week of gestation affecting up to 1-5% of couples trying to establish a family .In addition to a recorded increase in the rate of spontaneous miscarriage among the Iraqi women at all ages and all over the country where an interplay of several etiologies, occupational, environmental and lifestyle factors were suggested to be the causes of the miscarriage.

Aim: To explain the association between occupational, environmental and lifestyle factors affecting the spontaneous miscarriage in Kirkuk city.

Patients &Methods: A total of (500) pregnant women in the age of (18-48) years old attending the outpatient of Obstetrics and Gynecology at Azadi Teaching hospital in Kirkuk city during the period from December (2010) to December (2012). Data used in the research were collected using a questionnaire designed for this study.

Results: From a total of (500) pregnant women subjected to various laboratory tests and to strict examination by the Obstetrics &Gynecology consultant, about (478) healthy pregnant women were selected and were subdivided into two groups; the first group included (328) women whom pregnancies were terminated by spontaneous miscarriage in the first trimester (<13 weeks of gestation), the other group included (150) women who had progressed to delivery. The results of the occupational factors inquiry showed that, teaching and medical occupations significantly affected pregnancy outcomes ($p<0.05$) and increased the spontaneous miscarriage compared to the results showed by the other occupations. A comparison between rural and urban results of pregnancy outcome showed a significant increase ($p<0.05$) in the spontaneous miscarriage rate among the urban patients (79.1%). Moreover, the lifestyle factors that included smoking, coffee and stress all showed significant increase ($p<0.05$) in the percentage of spontaneous miscarriage in about (63%, 66.1% and 89.6%) respectively.

Conclusions: Results showed a high rate of spontaneous miscarriage among the pregnant women in Kirkuk city during the period from December 2010 to December 2012 especially among teaching and health professional occupations. Besides the frequency of spontaneous miscarriage was higher in urban than in rural area in addition to Lifestyle factors that included smoking, coffee intake and stress which significantly increased the rate of spontaneous miscarriage.

Key words: Occupational, Environmental, Lifestyle, factors, Spontaneous miscarriage , Kirkuk.

Introduction

Most studies report that around one in five of all pregnancies will end in miscarriage (fetal death before 24 weeks) (1&2). While, some women will experience recurrent (three or more consecutive) spontaneous miscarriages, but these are estimated to be a small proportion (<10%) of all pregnant women (3, 4 &5). Specific clinical factors have been shown to increase a woman's risk of recurrent spontaneous miscarriage, including thrombophilia and parental cytogenetic abnormalities, uterine anomalies, endometrial infections and endocrine etiologies (4, 5&6). But the determinants of the majority of miscarriages that occur are not wholly understood, and many putative risk factors remain controversial or unconfirmed (5). Well-established risk factors for miscarriage include increased maternal age, history of miscarriage and infertility (6, 7&8). Although, the interaction between age, parity, infertility and previous pregnancy loss is complex and still not entirely understood (9, 10 &11). Several behavioral and social risk factors have been reported as increasing the risk of miscarriage, but most remain controversial or unconfirmed. Alcohol consumption, smoking and caffeine intake are the main examples (12, 13, 14 &15).Moreover, it was reported by the world health organization in a survey on Iraqi family health that, spontaneous miscarriage had a high rate in Iraq and about 50% of these miscarried women the reason is unknown (16).

Patients and Methods

Patients : Five hundred pregnant women in the age of (18-48) years attending as the out patients of Azadi Teaching hospital in Kirkuk city during the period from December 2010 to December 2012 were examined against the following tests including; Toxoplasmosis test, antiphospholipid antibody test, hemoglobin level (Hb), general urine examination and blood sugar level. Karyotype screening for each patient done by the hospital laboratories. All pregnant women were subjected to extensive medical examination by the consultant of Obstetrics and Gynecology before including them to the study. Pregnant women that showed abnormal test results or any physiological abnormalities were excluded from the study.

Methods:

1-Data collection: The data were collected using a questionnaire designed for this investigation according to (7 & 17) with the following questions:

- An insight to family history and living area
- Dietary intake and Lifestyle habits
- Maternal exposure to environmental hazards

2- Study protocol: Data collected from the patients history was divided into three cohorts according to the factors being in evaluation according to (1) as follows:

Cohort (1): Patient's Occupation :

Occupations being evaluated were classified according to standard procedures (18) and occupations were classified into three major groups that included;

1- Health professionals (Generalist and specialist medical practitioners and dentists).
2- Teaching professionals (University and higher education teachers, Secondary and primary education teachers).
3- Other occupations that included (Engineering, agricultural, administrative occupations).

Cohort (2): Patient's Residency :

Included the assessment of patients residency on spontaneous miscarriage and residencies were

classified according to procedures (16) into urban and rural area.

Cohort (3): Patient's Lifestyle :

Lifestyle factors were classified according to the standard procedures (9 &14).

3-Statistical analyses: statistical analysis were carried out according to the methodology recommended in (19).

Results

A total of (500) pregnant women in the age of (18-48) years attending as the out patients of Azadi Teaching hospital in Kirkuk city during the period from December 2010 to December 2012 were examined against a number of laboratory tests and the pregnancy of about (478) healthy women was followed out where results showed that, only about (150) pregnant female had completed their pregnancy to full term. While, (328) female had spontaneous miscarriage in the first trimester and all of the pregnant women were subjected to the study questionnaire. Collected data were divided into three cohorts.

The results of the effects of patient's occupation on the spontaneous miscarriage were shown in figure (1).

On the other hand, figure (2) showed the results of effect of the patient's residency on the frequency of the spontaneous miscarriage frequency in urban and rural area.

The third cohort included the estimation of lifestyle factors effect on the frequency of spontaneous miscarriage and results were shown in figure (3).

Discussion

This study was conducted to stand on the prevalence of spontaneous miscarriage Kirkuk city and to possibly explain the motivations behind the first trimester miscarriage other than the physiological and pathological causes.

Thus, about (500) pregnant women were screened by different laboratory tests where only the healthy pregnant women were selected to complete the study. Accordingly, a total of (478) pregnant women were selected and subjected to the questionnaire of the study where only (31.38%) of them had managed their pregnancy to full term while, about (68.62%) of them had spontaneous miscarriage in the first trimester indicating a prevalence of spontaneous miscarriage among pregnant women in Kirkuk city . The same results were found by (16&20) where the percentage of spontaneous miscarriage in Iraq was around (64.7%). Thus, in order to explain the possible causes that were standing behind the unexplained spontaneous miscarriages in these women, the data collected from the study questionnaire were divided into three cohorts:

The first cohort that included the evaluation of patient occupation on the frequency of the spontaneous miscarriage where a significant increase ($p<0.05$) in spontaneous miscarriage was recorded among the teaching (79%) and health professionals (52%) respectively. While, the frequency of the spontaneous miscarriage and full term pregnancy was almost equivalent between the pregnant women carrying out other occupations. The existing data supported the hypothesis that, in general, working women have a higher risk of undesirable reproductive outcomes (21, 22&23).

However, the same results were obtained by the researchers (24, 25 & 26) where they declared that, sweating reduces plasma volume, which is an important determinant of utero-placental blood flow and the circulatory blood flow in the uterus and placenta decreases in the long standing position in addition to the heat stress that causes dehydration resulting in the release of the anti-diuretic hormone and oxytocin which stimulates the uterus to contract. Moreover, the heavy work schedule and exposure to stressful work conditions would all together increase the frequency of the spontaneous miscarriage between doctors and teachers (25&26).

On the other hand, results of figure (2) showed a significant increase ($p<0.05\%$) in the frequency of spontaneous miscarriage in the urban patients (79.1%) in comparison to the patients from the rural area in Kirkuk city (38.5%) probably due to

stressful conditions and noise and environmental factors.

The same results were ascertained by (16 &27) where they found out that, the frequency of spontaneous miscarriage was about (64.7%) in urban. While, the frequency that was found by the same researchers was (55.6%) for the rural area which means there is a decrease in the frequency of the spontaneous miscarriage in rural regions in Kirkuk city.

Lifestyle factors that included obesity, smoking, over-intake of coffee (more than four cups /day) and stress were all studied for their effect on increasing the frequency of spontaneous miscarriage; where coffee (66.1%) and stress (89.6%) factors showed the higher frequency of spontaneous miscarriage in the examined pregnant women.

Results of figure (3) showed that, overweight women showed a spontaneous miscarriage rate of (43.77%) whereas, underweight pregnant women showed a spontaneous miscarriage rate of (56.23%) respectively. The same results were obtained by (28 & 29) where both under- and overweight women are at higher risk of miscarriage than those of normal weight, and maternal pre-conception body mass index (BMI) has been shown to be a risk factor for stillbirths for women with a BMI of less than 18.5 or greater than 25 kg/m2.22.

Moreover, results of figure (3) showed a significant increase ($p<0.05\%$) in the frequency of the spontaneous miscarriage between smoking women (63%). The same results were obtained by (30&31) were they recorded that nicotine has been shown to be a potent vasoconstrictor reducing uterine and placental blood flow. These properties may account for the increase in spontaneous miscarriage seen in smoking women.

Furthermore, coffee intake showed a significant increase in the spontaneous miscarriage rate of (66.1%). However, the recorded result did not agree with the results obtained by (32, 33, 34 & 35)where they stated that, Coffee and caffeine consumption were unrelated to total miscarriage risk and there is little indication of possible harmful effects of caffeine on miscarriage risk within the range of coffee and caffeine consumption reported.

Stress factor on the other hand, showed that significant increase in the frequency of spontaneous miscarriage rate of (89.6%). These results came in agreement with the results obtained by (27, 36& 37) where they stated that, the body most important systems; immune, endocrine and nervous system all engage in multiple interactions during body response to stress.

Conclusions

1. Spontaneous miscarriage was prevalent among the pregnant women in Kirkuk city during the period from December 2010 to December 2012.
2. Spontaneous miscarriage was prevalent among teaching and health professionals other than other occupations.
3. Spontaneous miscarriage frequency was higher in urban than in rural area in Kirkuk city.
4. A decrease was recorded in the frequency of spontaneous miscarriage in rural area in Kirkuk city less than that percentage recorded in 2006.
5. Lifestyle factors included smoking, coffee and stress recorded significant effects on increasing the rate of spontaneous miscarriage.

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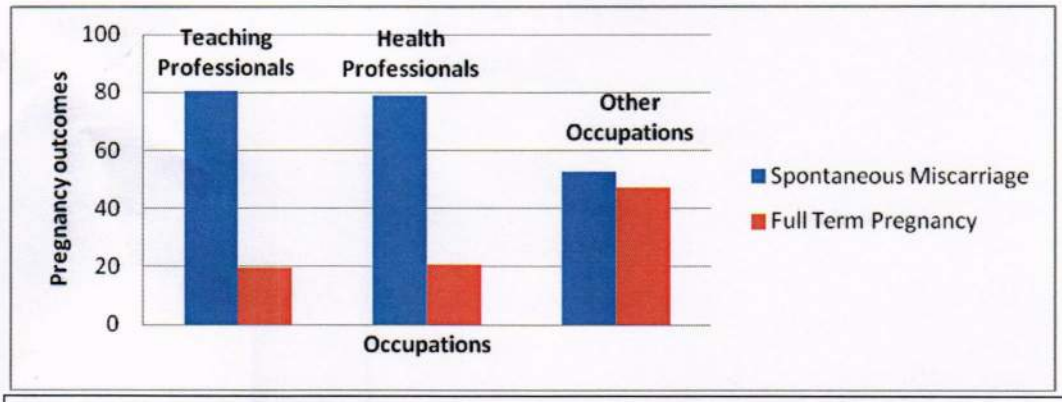
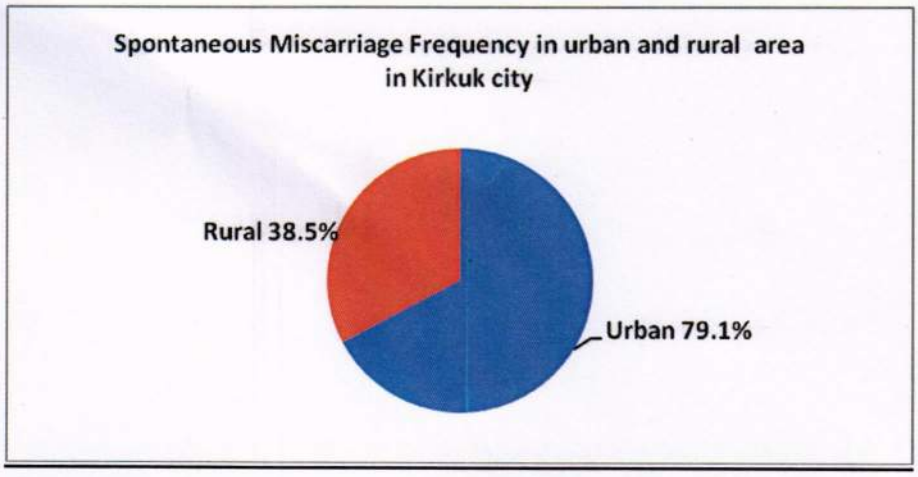
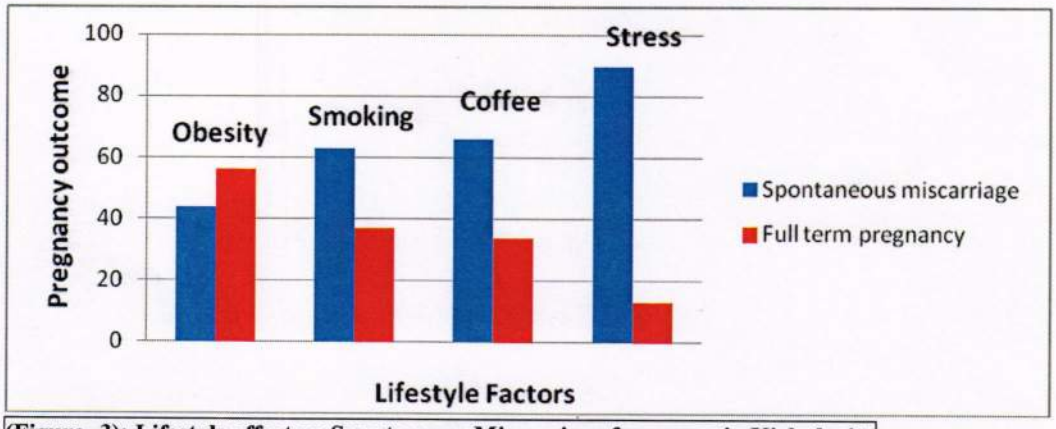


(Figure -1): The effect of different occupations on the pregnancy outcome in Kirkuk city.



(Figure -2): Spontaneous Miscarriage frequency in urban and rural area in Kirkuk city



(Figure -3): Lifestyle effect on Spontaneous Miscarriage frequency in Kirkuk city