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Factors Associated with Early Pregnancy Losses Among Residents of the UAE

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Abstract

The goal of this study was to determine the factors that contribute to early pregnancy losses among UAE residents. An early pregnancy loss is defined as loss of fetus in the first trimester of pregnancy, before week 12. Our study assessed several risk factors that can lead to a pregnancy loss such as: maternal age, ethnicity, marital status, occupation, lifestyle, stress, previous history pregnancy losses or significant family history, and previously diagnosed illnesses or abnormalities of female reproductive system.

The data was collected from pregnant women of all nationalities, ages 18 to 45 attending Thumbay Hospital and Thumbay University Hospital, Ajman. The sample size of the study was 135 cases of early pregnancy loss and 134 controls, women with successful pregnancies.

The risk of a pregnancy loss among pregnant women was significantly increased by history of previous pregnancy losses, bleeding during pregnancy, cervical weakness, and PCOS. Among other less significant factors that could possibly lead to a pregnancy loss was smoking during pregnancy and consanguinity of the couple. Therefore, we recommend couples screening and preconception counseling, especially for women who had experienced pregnancy losses before and those diagnosed with PCOS or cervical weakness.

Keywords: Risk factors, Pregnancy loss.

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1. Introduction

Pregnancy loss is considered to be before the twentieth gestational week, or specifically 139 days, from the first day of the last regular menstruation1. Royal College of Obstetricians and Gynaecologists (RCOG) defines pregnancy loss as a loss of fetus from the time of conception until 24 weeks of gestation. RCOG guidelines also describe an early pregnancy loss (EPL) as a "confirmed empty sac or sac with fetus but no FHA (fetal heart activity) before 12 weeks of pregnancy". The same definition may be referred to as a delayed miscarriage1. American guidelines confirm that 80 out of 100 pregnancy loss cases occur within the first trimester [1].

1.1 Prevalence of pregnancy losses among pregnant women in the world

An epidemiology study in India 2015 showed that 767 women (32 %) of the 2398 patients screened, experienced at least one spontaneous pregnancy loss. The prevalence of RSM (recurrent spontaneous miscarriage) among the 753 women in the study was 7.46 % [2]. According to an epidemiology study on pregnancy loss made in the United Arab Emirates, Abu Dhabi, Al Ain, in the Public Health Institute College of Medicine and Health Sciences University that was conducted in 2020 amongst asked 2,227 women who have been pregnant three or more times, the highest proportion of pregnancy losses was for those who had two or more losses of any type (14.7%) while the lowest proportion was for those who suffered consecutive three or more losses (5.8%) [3].

1.2 Factors leading to pregnancy loss among pregnant women in the world

The risk factors associated with pregnancy losses could be uterine anomalies, clotting disorders, endocrine disorders, infections, genetic disorders, immunological factors and age [2]. In relation to age, the study showed that less than three pregnancy losses were found in the age group of 23-27 years, while recurrent pregnancy loss rate was recorded higher in the age group of more than or equal to 33 years (14.68 %) [2]. In a prospective cohort study of over 421,000 pregnancies done in Norway, the risk of pregnancy loss (after excluding induced abortions) was lowest (10 percent) in women age 25 to 29 years and rose to as high as 57 percent for women aged ≥45 years. Moreover, women that were pregnant between 2009-13 years in this study had a higher risk of pregnancy loss if the previous birth ended in a preterm delivery [5].

Subchorionic hematoma or hemorrhage can rise the chances of pregnancy loss especially when it's 25% or more of the gestational sac volume. Research showed that women with this condition had double the odds of EPL compared with women without it [6]. Medication and substance use in risk of EPL is difficult to assess due to the dose, agent and timing of exposure. Research published by the University of Montreal presented with results that NSAIDs during pregnancy with adjusting for potential confounders specifically, the use of Diclofenac, Celecoxib, Ibuprofen and Rofecoxib alone or combinations were all associated with increased risk of

pregnancy loss [7]. A systematic review and meta-analysis for publications from January 1970 to January 2019 identified studies about alcohol exposure during pregnancy and its relevance to pregnancy losses. Meta-analysis of data from 231,808 pregnant women finds those exposed to alcohol during pregnancy had a greater risk of pregnancy loss compared to those who abstained, and it is associated with a dose-mediated increase in risk of pregnancy loss [8].

A study taken in University of Pittsburgh, USA collected data on 400 pregnant adolescents (aged 14 to 40 years) who had pregnancy loss at study entry or during follow-up (within 22 weeks' gestation) and 570 adolescents remained pregnant past 22 weeks' gestation. 24 percent of the risk of pregnancy loss was related to cocaine or tobacco use [9]. Approximately 15 percent of EPL is associated with infectious etiology. Parvovirus B19 disease in pregnancy has an 8 percent aggregate occurrence of misfortune, the danger of misfortune is 5.6 occasions higher with contamination in the primary trimester as compared with the second trimester [10]. Untreated syphilis leads to a 21 percent increased risk of fetal loss and stillbirth [11]. Maternal cytomegalovirus (CMV) infection has 2.5 increased odds of EPL as compared with non-infection [12].

Pregestational diabetes complicates 1 to 2 percent of all pregnancies and accounts for 13 to 21 percent of diabetes in pregnancy [13]. Obesity is one of the greatest concerns associated with pregnancy losses. A 2008 meta-analysis of 16 studies demonstrated that a body mass index greater than 25 was associated with a nearly 70 percent increased odds of EPL after spontaneous or assisted conception [14]. Obese pregnant women are at increased risk for maternal and perinatal complications, the risks are amplified with increasing severity of obesity. Thyroid diseases such as hyper and hypothyroidism have been associated with increased risk of pregnancy loss, studies reported a doubling of risk of EPL [15]. Acute and chronic stress increase the risk of pregnancy loss. Stress is multifactorial which is difficult to separate from other risks; chronic stress causes increased cortisol levels, decreased immunity, and increases miscarriage [16].

2. Preliminary Notes

Pregnancy loss: is a spontaneous abortion or pregnancy termination without medical or mechanical intervention before the 24th gestational week.

Sporadic pregnancy loss: is a one-time event in the life of a woman.

Recurrent pregnancy loss: is considered to be a repeated event of 3 or more consecutive pregnancy losses.

Early pregnancy loss: *(EPL)* is a confirmed empty sac or sac with fetus but no fetal heart activity before 12 weeks of pregnancy.

3. Main Results

For this study, we have included 135 cases and 134 controls. Among the controls, about 46% and among cases about 52% were from the Eastern Mediterranean region. On the other side, there were only 0.7% of controls and 1.2% of cases from the

Americas region. Interestingly, there were no cases and 5.2% of controls from the African region. Most of the study participants were housewives, particularly around 51% among controls and 49% among cases.

When considering how sociodemographic variables are associated with pregnancy loss, it has been noticed that European group had the highest probability of pregnancy loss – nearly 77% of the group were cases, although the total amount was small. Similarly, African group was very small, however, 100% of them were controls, with no recorded cases. Eastern Mediterranean and South-East Asian regions had almost the same around 50% of cases and controls.

Under the occupation, employers took our attention - although P value is not significant and the number is small, 80% of them were cases and 20% controls. We could assume that owners of their own businesses undergo more stress when compared to housewives, employees, and students.

Among pregnant women diagnosed with PCOS, the majority were cases - 75%. Hence, PCOS could be considered one of the significant risk factors leading to negative outcomes and possibly pregnancy loss. When analysing pregnancy losses number, the most number of cases (86%) were among those who's had 2 previous pregnancy losses, and similarly 83% of cases among those who's had 1 pregnancy loss, and more than 79% of cases among whose who's experienced 3 or more pregnancy losses. Cervical weakness is another significant diagnosis that could lead to possibility of pregnancy loss. Among patients with cervical weakness or incompetence, around 71% were cases and 29% were controls.

Bleeding during pregnancy indicates that the process of losing the pregnancy has already started, and most probably, due to an unidentifiable cause. More than 71% of pregnancies with bleeding were cases and around 29% were controls. Smoking during pregnancy was found to be another possible risk factor, particularly, 87.5% of pregnant women who smoked during their pregnancies were cases, and only 12.5% were controls, although the total amount is low. Consanguinity was also a significant factor, where among related couples almost 74% were cases, and around 26% were controls.

Age at first pregnancy was also found to be linked to the risk of pregnancy loss. Among those who had their first child before 20 years old, 47.4% were cases and 52.6% were controls. Among those of age between 20 and 25, 59.4% were cases and 40.6% were controls. However, among those of age between 25 and 30 to have the first child, 39.6% were cases and 60.4% were controls.

Significant variables negatively affecting the outcome of the pregnancy and increasing the chances of pregnancy loss are PCOS, bleeding during pregnancy, and consanguinity. In particular, women with PCOS have 3.8 times more chances of pregnancy loss. Women with bleeding during pregnancy are expected to have this pregnancy resulted in loss 11.9 times more than women who did not bleed during pregnancy. Couples that are related are expected to have 3.4 times more chance of pregnancy loss compared to couples who are not related to each other.

Significant variables are only bleeding during pregnancy and number of previous pregnancy losses. That means that a pregnant woman has the most chances of a

pregnancy loss if she has already experienced more than 2 losses before, and if she experiences bleeding during the current pregnancy. Particularly, if the pregnant woman bleeds, she has got a 7.5 times bigger chance of pregnancy loss. And if a woman has already experienced 2 or more pregnancy losses before, she has almost 5 times higher chance of another loss, compared to a woman who has never experienced pregnancy loss or only one.

4. Labels of tables

Table 1: Frequencies of nationality groups and occupation among cases and controls

Variable	Group	Controls		Cases		Total
		No.	%	No.	%	
Nationality	Eastern Mediterranean	62	46.3	70	52.3	132
	European	3	2.2	10	11.6	13
	South-East Asia	57	42.5	52	34.9	109
	African	7	5.2	--	--	7
	Americas	1	0.7	2	1.2	3
	Western Pacific	4	3.0	1	1.2	5
Occupation	Housewife	114	85.1	110	81.5	224
	Employee	18	13.4	21	15.6	39
	Employer	1	0.7	4	3.0	5
	Student	1	0.7	--	--	1

Table 2: Association between sociodemographic variables with pregnancy loss

Variable	Group	Controls		Cases		Total	P
		No.	%	No.	%		
Nationality	Eastern Mediterranean	62	47.0	70	53.0	132	--
	European	3	23.1	10	76.9	13	
	South-East Asia	57	52.3	52	47.7	109	
	African	7	100.0	--	--	7	
	Americas	1	33.3	2	66.7	3	
	Western Pacific	4	80.0	1	20.0	5	
Occupation	Housewife	114	50.9	110	49.1	224	--
	Employee	18	46.2	21	53.8	39	
	Employer	1	20.0	4	80.0	5	
	Student	1	100.0	--	--	1	
Age Group	<25	12	42.9	16	57.1	28	NS
	25-29	33	47.8	36	52.2	69	
	30-34	47	49.0	49	51.0	96	
	>=35	42	55.3	34	44.7	76	

Table 3a: Association between medical history variables with pregnancy loss

Variable	Group	Controls		Cases		Total	P
		No.	%	No.	%		
History of irregularmenstrual cycles	Yes	11	35.5	20	64.5	31	NS
	No	123	51.7	115	48.3	238	
PCOS	Yes	4	25.0	12	75.0	16	<0.05
	No	130	51.4	123	48.6	253	
Age at first pregnancy	<20	10	52.6	9	47.4	19	<0.05
	20-24.99	26	40.6	38	59.4	64	
	25-29.99	58	60.4	38	39.6	96	
	>=30	31	70.5	13	29.5	44	
Age group	<25	12	42.9	16	57.1	28	NS
	25-29	33	47.8	36	52.2	69	
	30-34	47	49.0	49	51.0	96	
	>=35	42	55.3	34	44.7	76	
Pregnancy Losses N	A0	107	98.2	2	1.8	109	<.001
	A1	17	17.0	83	83.0	100	
	A2	5	13.9	31	86.1	36A	
	A>=3	5	20.8	19	79.2	24	
Registered for antenatalcare	Yes	133	50.6	130	49.4	263	NS
	No	1	16.7	5	83.3	6	
Rh incompatibility	Yes	7	35.0	13	65.0	20	NS
	No	125	50.6	122	49.4	247	
Diabetes	Yes	9	90.0	1	10.0	10	<0.05
	No	125	48.3	134	51.7	259	

Table 3b: Association between medical history variables with pregnancy loss

Variable	Group	Controls		Cases		Total	P
		No.	%	No.	%		
GDM	Yes	10	62.5	6	37.5	16	NS
	No	124	49.2	128	50.8	252	
Hypertension	Yes	14	70.0	6	30.0	20	NS
	No	120	48.2	129	51.8	249	
Anaemia	Yes	15	78.9	4	21.1	19	<0.05
	No	119	47.6	131	52.4	250	
Family history of chromosomal abnormalities	Yes	2	33.3	4	66.7	6	NS
	No	132	50.4	130	49.6	262	
Family history of pregnancylosses	Yes	1	33.3	2	66.7	3	NS
	No	133	50.0	133	50.0	266	
Uterine abnormality	Yes	9	36.0	16	64.0	25	NS
	No	125	51.2	119	48.8	244	
Cervical weakness	Yes	11	28.9	27	71.1	38	<0.05
	No	123	53.2	108	46.8	231	
Endocrine disorder	Yes	11	47.8	12	52.2	23	NS
	No	123	50.0	123	50.0	246	
Past history of surgical gynecological interventions	Yes	85	64.4	47	35.6	132	<.001
	No	49	35.8	88	64.2	137	

Table 3c: Association between medical history variables with pregnancy loss

Variable	Group	Controls		Cases		Total	P
		No.	%	No.	%		
Congenital fetal abnormalityin previous pregnancies	Yes	22	66.7	11	33.3	33	<0.05
	No	112	47.5	124	52.5	236	
Bleeding during pregnancy	Yes	45	28.7	112	71.3	157	<0.01
	No	87	79.8	22	20.2	109	
Infections during pregnancy	Yes	22	50.0	22	50.0	44	NS
	No	112	49.8	113	50.2	225	
Smoking during pregnancy	Yes	1	12.5	7	87.5	8	<0.05
	No	133	51.0	128	49.0	261	
Alcohol consumption during pregnancy	Yes	1	50.0	1	50.0	2	NS
	No	133	49.8	134	50.2	267	
Consanguinity	Yes	5	26.3	14	73.7	19	<0.05
	No	129	51.6	121	48.4	250	

Table 4: Crude odds ratio

Variable	Group	COR	P-value	CI
PCOS	No	1	--	--
	Yes	3.8	<0.05	1.13 – 12.75
Age at firstpregnancy	<20	1	--	--
	20-24.99	1.5	NS	0.46 – 4.69
	25-29.99	0.72	NS	
	>=30	0.43	NS	
Anaemia	No	1	--	--
	Yes	0.29	NS	0.08 – 1.02
Cervical weakness	No	1	--	--
	Yes	1.99	NS	0.85 – 4.68
Bleeding during pregnancy	No	1	--	--
	Yes	11.92	<0.001	5.87 – 24.21
Smoking during pregnancy	No	1	--	--
	Yes	6.49	NS	0.71 – 59.05
Consanguinity	No	1	--	--
	Yes	3.40	<0.05	1.12 – 10.30

Table 5: Adjusted odds ratio

Variable	Group	AOR	P-value	CI
PCOS	No	1	--	--
	Yes	2.24	NS	0.57 – 8.78
Cervical weakness	No	1	--	--
	Yes	1.31	NS	0.55 – 3.16
Bleeding during pregnancy	No	1	--	--
	Yes	7.54	<0.001	4.09 – 13.93
Consanguinity	No	1	--	--
	Yes	1.73	NS	0.50 – 6.03
Number of Losses	1	1	--	--
	2	4.98	<0.001	2.21 – 11.23

5. Conclusion

The risk of a pregnancy loss among pregnant women was significantly increased by multiple factors, namely history of previous pregnancy losses, bleeding during pregnancy as initiation of a spontaneous pregnancy loss due to non-identifiable causes, as well as diagnosis of PCOS, and consanguinity.

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