

PERINATAL COMPLICATIONS ASSOCIATED WITH MATERNAL SMOKING IN IRAQI PREGNANCIES: A RETROSPECTIVE ANALYSIS

Dr. Hend Raheem Abdelhamze ALkharkushi ¹, Dr. Fadia Mijbil Abbas ³

^{1,3} M.B.Ch.B., C.A.B.O.G. \ (Specialist Obesterics and Gynogology), Iraqi Ministry of Health, Al-Karama Teaching Hospital, Baghdad Health Al-Kharkh Directorate, Baghdad, Iraq

Dr. Falah Hassan Ahmed ²

² M.B.Ch.B., C.A.B.CM \ (Community Medicine), Iraqi Ministry of Health, Baghdad Al-Rusafa Health Directorate, Ibn Al-Baldi Hospital for Paediatric and Gynaecology, Baghdad, Iraq

Abstract:

Background: Smoking use is the most important modifiable risk factor for pregnancy-related morbidity and mortality because it doubles the probability that children may be stillborn or die in the first year of life and increases the probability of suffering from multiple diseases, especially respiratory and otolaryngological.

Objective: This study aimed to determine and analyze the clinical outcomes of perinatal complications related to maternal smoking in Iraq. **Patients and methods:** We conducted a retrospective study of pregnant mothers, which included 75 samples whose ages ranged between 20-40 years. Participants' clinical data were collected from hospitals and centers located in Baghdad - Iraq, and this study covered the period from July 5, 2022, to April 16, 2023. This study recorded patients' clinical data, which included daily cigarette use during pregnancy, neonatal intensive care unit admission, and length of stay in Hospitalization, gestational age, fetal mortality rate, and admission to the intensive care unit. Also, this study recorded rates of perinatal complications associated with maternal smoking. We conducted a univariate analysis of the risk factors affecting pregnant women and the fetus after birth, and the long-term quality of life of pregnant mothers was assessed. **Results:** The study enrolled maternal data, which revealed that the majority of participants were in 20 – 30 years had 36 cases, the rate of comorbidities was 36%, and the rate of maternal smoking per day in the second half of pregnancy was between 1 and 8 cigarettes, with 45 cases, 10 cases involved a previous abortion, type of pregnancy included singleton (n = 72) and twin (n = 3) pregnancies, birth weight of the neonates was 2.5-3.0 kg, with 68% of neonates having this weight, admission to the neonatal intensive care

unit (NICU) occurred in 15 cases, the initiation of breastfeeding occurred in 54 cases, the birth type included stillbirth in 6 cases, while the rate of live births was 69 cases, the rate of perinatal complications related to maternal smoking was 24.0%, and the poor items of quality of life were daily activity with 62.10 ± 13.30 and social and emotional functions with 65.50 ± 12.9 . **Conclusion:** Smoking during pregnancy is a major health problem. Maternal smoking conceives a serious risk not only for physical health but which increases of the risk mortality rate of maternal and fetuses

Keywords: *Maternal Smoking, Perinatal Complications, Quality-of-Life Fetus, and Birthweight.*

Introduction

Introduction

Every year, tobacco use causes around 5 million deaths in the world. According to the WHO, it is the leading cause of preventable mortality and morbidity among adults in developed countries. According to data from the National Health Survey of the INE (2014) [1,2], 36% of men and 24% of women smoke in Spain. The estimate of women smokers during pregnancy is 12 to 20%, but it is difficult to know exactly as pregnant women have a certain tendency to underreport consumption. The high prevalence of smoking during pregnancy occurs in young women with low educational education. [3]

In developed countries, tobacco use during pregnancy is the most important isolated modifiable risk factor for pregnancy-related morbidity and mortality because it doubles the probability that children may die at birth or during the first year of life and increases the probability of suffering from multiple diseases, mainly respiratory or otolaryngological [4 – 7]. Fortunately, women who quit smoking at the beginning of their pregnancy have a similar risk as non-smoking women. Therefore, it is necessary to intervene on this problem. [8,5]

It is during the prenatal stage (before birth) where it can be decisive for a healthy and normal development to take place in the future [9]. There will be internal and external factors (or better-called teratogens) in the mother that can affect either positively or negatively the correct progress of the pregnancy; the mother's tobacco use during pregnancy includes one of these risk factors. [10 – 12]

The treatment of smoking in pregnant women should be the main therapeutic measure that health professionals should adopt when providing health care to pregnant women. Many women smokers spontaneously quit smoking when they know they are pregnant [13]. Between 25% and 60% of spontaneous dropouts have been reported in the USA. Despite this, many other pregnant women continue to smoke and may require highly specialized medical attention. [14]

Quitting smoking is difficult, even for the pregnant woman who may have a great motivation for it in a studio. Of the pregnant women who quit smoking, just over a third would remain without smoking at six months postpartum, which would yield a “global” pregnancy effect of about 10%. [15]

Martínez Frias et al. 5, using the data of 31,056 mothers of children without birth defects, have studied whether there has been any variation in smoking during pregnancy in Spain [16]. They analyze the evolution of smoking by years; during the last 25 years, autonomous communities, characteristics, and other maternal habits, a secular increase in the prevalence of smoking mothers was observed between 2013 and 2014, later establishing itself at 27-28%. There is no secular reduction in the analyses by maternal ages, amounts, and autonomies. Only the mothers with the highest level of education showed a decrease in smoking in 2016, stabilizing at around 23% [17]. Mothers under the age of 25 are the ones who smoke the most. The data indicate that the prevalence

of women who smoke during pregnancy has not decreased either by years or by autonomous communities, although 19.19% stopped doing so in the first months of pregnancy. These results show the need to increase information for women to quit smoking before pregnancy. [18]

Nicotine is present in milk in concentrations between 1.5 and 3.0 times the simultaneous concentration of maternal plasma, and its intermediate elimination is 60-90 minutes in milk and plasma. There is no scientific evidence to indicate that this amount of nicotine is a risk to the child's health [19]. In any case, this substance has a negative influence on breastfeeding (LM) since it causes a decrease in milk production by causing a decrease in prolactin. It also interferes with the ejection reflex and causes a decrease in the child's weight gain. In addition, it could cause a rejection of the breast by the child by changing the taste and smell of milk and is associated with an increase in infant colic. [20]

Patients and methods

Seventy-five samples from Iraqi mothers who smoked participated in this study, and their ages ranged between 20-40 years. This study recorded all demographic and clinical data of pregnant mothers, which included age, body mass index, comorbidities, previous surgery, previous medication use, educational level, and monthly family income. All clinical data for Iraqi mothers were collected from hospitals in Baghdad - Iraq, as this study covered the period from July 5, 2022, to April 16, 2023. This study included women who ranged between 20-40 years of age and women who had concomitant diseases or had undergone previous surgeries. Women who had serious diseases, women who were over forty years old or under twenty years old, or women who lived outside Baghdad were excluded.

This study determined maternal diagnostic and clinical data, gestational age, method of delivery, daily use of cigarettes during pregnancy, previous pregnancies, number of cases, women who had undergone previous surgeries, previous miscarriages, and type of pregnancy. Moreover, our study was conducted on the clinical characteristics and complications of smoking that affected newborns in terms of the number of deaths, congenital malformations, birth weight, length of stay in the hospital, admission to the intensive care unit, and Apgar scores to measure pain in newborns.

A questionnaire was conducted to measure the extent of pain for mothers and newborns after birth using the VAS scale, where 0 represents no pain, and 10 represents the presence of severe pain. The quality of life of the patient's health condition was also measured, as the parameters included the physical aspect, the psychological aspect, the social and emotional aspect, and daily activities, as Scores ranged from 0, which shows a risk to the patient's quality of life, to 100, which represents recovery for the patient. In addition, this study identified perinatal complications associated with maternal smoking. Also, we conducted a univariate analysis to determine the risk factors that affected the mother and fetus in the long term after birth.

Results

Table 1: Baseline and demographic data.

Features	Number of patients [75]	Percentage [%]
Maternal age		
> 20	12	16%
20 - 30	36	48%
> 30	27	36%
BMI, [Kg/m ²]		
< 30.0	42	56%
≥ 30.0	33	44%
Comorbidities		
Yes	27	36%

No	48	64%
Hypertension	6	8.0%
Diabetes	4	5.33%
Kidney diseases	3	4.00%
Preeclampsia	1	1.33%
Thyroid disorders	3	4.00%
Asthma	2	2.67%
Antepartum haemorrhage	2	2.67%
Urinary tract infection	4	5.33%
Polyhydramnios	2	2.67%
Previous surgeries		
Yes	12	16.0%
No	63	84.0%
Medications use		
Yes	24	32.0%
No	51	68.0%
Maternal education		
Secondary school	6	8.0%
College	12	16.0%
Bachelor's degree	17	22.67%
Postgraduate degree	40	53.33%
Working status		
Employed	23	30.67%
Unemployed	52	69.33%
Monthly income		
< 700	52	69.33%
700 - 1000	13	17.33%
> 1000	10	13.33%
Antenatal care (more than four visits)		
Yes	54	72.0%
No	21	28.0%

Table 2: Diagnoses findings of maternal.

Variables	Number of patients [75]	Percentage [%]
Gestational age, weeks		
Mode of delivery		
Cesarean section	18	24.0%
Operative vaginal delivery	57	76.0%
Hospital classification		
Private	24	32.0%
Public	51	68.0%
Cigarettes smoked per day in the second half of pregnancy.		
1 - 8	45	60.0%
9 - 14	21	28.0%
> 14	9	12.0%
Previous pregnancy		
Yes	63	84.0%

No	12	16.0%
Pregnancy loss		
Previous abortion	10	13.33
No abortion	65	86.67
Number of pregnancies		
0	12	16.0%
1	40	53.33%
2	14	18.67%
≥ 3	9	12.0%
Type of pregnancy		
Singleton	72	96.0%
Twin	3	4.0%

Table 3: Identify neonatal clinical characteristics.

Characteristics	Number of patients [75]	Percentage [%]
Birth weight (Kg)		
< 2.5	15	20.0%
2.5 - 3.0	51	68.0%
≥ 3	9	12.0%
Sex		
Male	47	62.67%
Female	28	37.33%
Admission NICU		
Yes	15	20.0%
No	60	80.0%
Breastfeeding initiation		
Yes	54	72.0%
No	21	28.0%
Birth type		
Stillbirth	6	8.00
Live birth	69	92.00
Apgar score		
Apgar, 1 minute	5.8 $\pm$ 0.2	
Apgar, 5 minutes	6.3 $\pm$ 1.1	
Length of stay, days	6 $\pm$ 21	
< 5	54	72.0%
≥ 5	21	28.0%
Resuscitation required	7	9.33%
Oxygen therapy	4	5.33%
Premature labour	6	8.0%

Table 4: Assessment pain scores of neonatal by VAS scale.

Time	VAS scores
2 hr	6.4 $\pm$ 0.5
6 hr	5.8 $\pm$ 0.1
12 hr	3.3 $\pm$ 0.2
Two days	2.8 $\pm$ 0.4

Table 5: Determine perinatal complications related to maternal smoking.

Complications	Cases [N]	Percentage [%]
Increased risk of premature birth	3	4.0%
Low birth weight	5	6.67%
Placental abruption	2	2.67%
Sudden Infant Death Syndrome (SIDS)	2	2.67%
Respiratory problems in newborns	4	5.33%
Attention deficits and behavioral problems	2	2.67%
Total	18	24.0%

Table 6: Assessment of quality of life of maternal in the perinatal period.

QoL scores	
Items	Maternal
Physical function	67.4 ± 9.5
Psychological function	73.2 ± 6.8
Social and emotional functions	65.50 ± 12.9
Daily activity	62.10 ± 13.30

Table 7: Univariate analysis of risk factors affecting on the mother and fetus.

Variables	OR	CI 95 %
Hypertension	0.66	0.60 – 1.72
Diabetes	2.30	0.92 – 4.81
Antepartum haemorrhage	3.3	1.5 – 6.4
Urinary tract infection	2.4	1.80 – 5.4
Polyhydramnios	4.8	2.5 – 5.7
Caesarean section	3.1	1.9 – 5.6
Premature labour	1.5	0.4 – 2.0
Stillbirth	2.7	1.9 – 3.2

Discussion

Passive smoking before, during, and after childbirth is a risk factor that increases infant morbidity and mortality [21]. It has been associated with multiple complications both in the perinatal period and in the subsequent development of the child: increased risk of sudden death, respiratory infections, asthma, cardiovascular disease, arterial hypertension, and type II diabetes Mellitus. On the other hand [22], LM has a decisive influence on children's health. This study confirms the negative relationship between smoking and LM: women who smoke tend to initiate LM less and maintain it for less time than non-smokers.

This coincides with multiple studies published in recent decades and represents a serious public health problem since the multiple harmful effects of passive smoking on newborns and infants should be added to the lack of the protective effect of LM [14,17,23,24]. Pregnancy and breastfeeding are the ideal occasions for health professionals to recommend quitting the habit and insist on the harmful effects of tobacco on pregnancy and on the health of the child. Mothers who wish to breastfeed their children but are unable to quit smoking should also be informed that the beneficial effects of breastfeeding outweigh the harmful effects of the passage of certain substances from milk. Thus, among children of women who continue to smoke and breastfeed, the incidence of acute respiratory diseases is lower than smoking mothers who choose to feed their children with artificial milk. Smoking and breastfeeding are, therefore, less harmful than the bottle plus the smoking habit. [25,26]

The really harmful thing for infants is to stay in environments rich in tobacco smoke. The perinatal period is the most vulnerable stage of the human being because in this phase, alterations in the adaptation of organs and systems can occur, either due to physiological and/or metabolic changes during the transition from intrauterine to extrauterine life. The perinatal period runs from the 28th week of gestation to the seventh week after birth [27]. Smoking mothers who choose to breastfeed should know that the ideal is to smoke right after breastfeeding their child and that they should make sure that at least a couple of hours pass between the last cigarette and the teat so that the amount of nicotine that passes to the child is as small as possible. [28,29]

A significant association has also been found between the mother's educational level and smoking. University women smoke less than women with primary education. Other studies also show this association. This leads us to the need to place greater emphasis in low socio-cultural level families on the negative impact of tobacco on the health of newborns, infants, and children. [30]

Conclusion

During pregnancy, smoking cigarettes affects various pregnancy outcomes negatively. It is common for this connection to increase in proportion with preterm birth, birth length of fewer than 2500 grams, intrauterine growth retardation (IUGR), transfers to the neonatal intensive unit, and neonatal intensive unit admissions within seven days or more. This is why we need to lay greater emphasis on among them since there are certain outcomes of which are preventable if expectant mothers would stop smoking.

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