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Neonatal Effects of Substance Abuse during Pregnancy

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ABSTRACT

***Background*:** Drug abuse in pregnancy is not uncommon, and the use of illicit opioids during pregnancy is associated with an increased risk of adverse outcomes. The aim of the study was to assess neonatal outcome of pregnancy with maternal addiction.

Materials and Methods: In this cohort study we assessed 100 pregnant women 15 -49 years old. To identify drug exposure was used self- questionnaire (Self-Report). Data on pregnancies complicated by illicit drug abuse (n = 50) were collected during a 2-year period (2014 - 2016) at Hospitals affiliated to Mashhad University of medical sciences. Data on the type of drug, course of gestation and labor, and on neonatal complications outcome were considered. Medical records on all non-dependence pregnancies during the study period were used as a non-exposed group (n = 50).To control possible confounding factor was used of multiple logistic regression model.

Results: our results showed The risk of various congenital anomalies was 5-fold in the group of children born to addicted mothers (RR = 5.65, 95% CI: 0.27-114.7). Also RDS (RR=5.1, 95% CI: 1.16-22.3), meconial amniotic fluid (RR=2.26, 95% CI: 0.21-24.1), NICU admission (RR=3.07, 95% CI: 1.93-4.88), neonatal seizure (RR=5.38, 95%CI: 1.97-14.64), neonatal hypoglycemia (RR=2.26, 95% CI: 0.60-8.54) were significantly more common in the group of pregnant addicts.

Conclusion: Addiction pregnancies must be considered as high-risk pregnancies according to perinatal outcome. We should prepare Appropriate obstetric and neonatal care in these pregnancies.

Keywords: substance abuse, pregnancy outcome, neonatal outcome

Introduction

Substance abuse remains one of the major problems that societies are facing worldwide. Substance abuse is more common in young adults of both genders. Nearly 90% of drug-abusing women are of childbearing age.[1] However, the exact number of drug-dependent women is unknown.[2] Some women tend to keep the use of illicit drugs for fear of stigmatization and discrimination.[3, 4] Heroin alone or in combination with methadone has been used during the past decade by approximately 80% of addicted mothers in Croatia and worldwide.[3, 5]

More than 50% suffer from psychiatric comorbidity and in 80% of cases; opiate addicts take at least 1 more drug or psychoactive substance together with heroin.[3]

Major health problems associated with high-risk lifestyle observed in pregnant illicit opiate users. These include poor nutritional habits, increased incidence of infectious and sexually transmitted diseases, other substance abuse, and poor antenatal care.[6]

These factors contribute to an increased risk of obstetric and neonatal complications.[6-8]

In utero drug exposure may have impact on development of the fetus.[9]

Perinatal complications like perinatal death, prematurity, growth retardation, neonatal withdrawal syndrome, and other complications have been frequently observed in the opium-addicted women. [6,10-13]

Recent studies have shown increase in young women drug abuse during two decades. Nearly 7.3% of pregnant women would be substance abuser. (10)

The purpose of the study was to compare perinatal outcome between opium-exposed and unexposed pregnant women and neonatal complications in their babies in Mashhad universities' hospitals.

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Methods

In this prospective cohort study, data of addicted pregnant women who their neonates admitted in NICU to the Imam Reza Hospital (Mashhad University, Iran) were analyzed.

During the study period from March 2014, to March 1, 2016, we recorded 50 pregnant women with their neonates that have used illicit drugs during pregnancy.

Determination of exposure to drug, was made by self- questionnaire (Self-Report) before pregnancy termination and without knowledge of the birth outcome.

We were Included all cases who assign consent form and who did not desire to participate in the study were excluded.

Data collected included demographic information, history of drug use, and perinatal outcome measures, were considered. Gestational age was calculated from the onset of the last menstruation and corrected according to ultrasonography (US) finding.

In children born to addicted mothers, 1 and 5-minute Apgar score, and Finnegan score were performed.

The data obtained were compared with non-exposed group that included all non-addicted women admitted for delivery during the study period (n = 50) and their newborns (n = 50).

Statistical data analysis was performed using SPSS 11 statistical software, t-test, Mann-Whitney test for quantitative data, and χ^2-test and risk ratio for qualitative data. The level of statistical significance was set at $p < 0.05$.

Results

During the study, there were 50 addiction pregnancies with their newborns that compared with 50 non addiction pregnancies and newborns. General characteristics of exposed and non-exposed groups of pregnant women are shown in Table 1.

In the study group of 50 pregnant addicts, Opium extract (shireh) was used by 21 (46.7%), opium was used by 19 (42.2%), methadone alone by 13(28.9%), Crack was used by 5 (11.1%), Ice was used by 5 (11.1%), Cannabis was used by 1 (2.2%), heroin was used by 1 (2.2%), LSD was used by 1 (2.2). (Table 2)

The mean and standard deviation of Apgar score (1th minute) in newborns of addicted mothers was 7.56±1.30 compare with non-exposed group 8.20±1.21 (P=0.01).

The mean Apgar score at 5th minutes in exposed group was 8.38±1.65 compare with non-exposed group; 9.67±0.51 (P=0.000).

There was statistically significant difference in birth weight between exposed group (2481±549 g) and non-exposed group (3196±530g). (P=0.000).

In the neonates born to addicted mothers, the length of hospital stay was not significantly longer than in the non- exposed group (P=0.28).

Table 1: Main Maternal Characteristics and Pregnancy Data

Variables	Exposed group N (%)	Non-exposed group N (%)
Address		
Urban	43(95.6)	46(90/2)
Rural	2(4.4)	5(9.8)
Education		
Illiterate	10(22.2)	4(7.8)
Elementary	13(28.9)	19(37.2)
Guidance	16(35.6)	15(29.4)
High school	5(11.1)	12(23.5)
University	1(2.2)	1(2)
Nationality		
Iranian	40(88.9)	35(68.6)
Non Iranian	5(11.1)	16(31.4)
age	31.89± 6.20(mean±SD)	28.53± 8.17(mean±SD)
Income (rials)	5500000± 3680000(mean)	8230000± 1820000(mean)

Table 2: Distribution of Pregnant Addicts according to Type of Opiate Used (n = 50)

Narcotic substance	Number (Percent)	Number of years of use (The mean and standard deviation)
Opium extract	21(46.7)	3.54±2.81
opium	3.54±2.81	6.14±5.90
Methadone	13(28.9)	2.22±1.30
Crack	5(11.1)	6.67±2.88
Ice	5(11.1)	3.67±2.51
Cannabis	1(2.2)	3
heroin	1(2.2)	3
LSD	1(2.2)	1

Table 3: Neonatal Outcome

Variable	**Risk ratio**	**Confidence interval for the Risk ratio**	**P-value**
Obvious anomalies	5.65	0.27-114.7	0.12
Respiratory problems	7.08	2.66-18.8	0.000
RDS	5.1	1.16-22.3	0.01
Meconium amniotic fluid	2.26	0.21-24.1	0.48
NICU admission	3.07	1.93-4.88	0.000
neonatal seizure	5.38	1.97-14.64	0.000
hypoglycemia	2.26	0.60-8.54	0.21

Discussion

Study findings showed that the average age of pregnant addicted women and the control group were 31.89+- 6.20, 28.53+- 8.17. Also Sanchez and

colleagues study showed an average age of pregnant women 27.1+-0.5. (14)

In the study group of 50 pregnant addicts, Opium extract (shireh) was used by 21 (46.7%), opium was used by 19 (42.2%), methadone alone by 13(28.9%), Crack was used by 5 (11.1%), Ice was used by 5 (11.1%), Cannabis was used by 1 (2.2%), heroin was used by 1 (2.2%), LSD was used by 1. (2.2%)

In our prospective cohort study, the prevalence of Opium extract (shireh) consumption was higher than the other materials (46.7%). The report of the International Organization for substance abuse, the highest rate is cannabis. (15) In a study in south London, heroin and later cocaine were (38 %, 24 %) more common. (16) In addition, 38.9 percent of pregnant women in Australia were addicted to marijuana. (17) The difference in the type of substance abuse in our country, due to our geographical position is acceptable. In this study diagnosis of substance abuse was based on maternal self-reporting to the attending physician. There may have been some under reporting due to the stigma of being a female substance abuser in our society. (18)

Mashhad has a large number of methadone maintenance treatment center and all addicts are encouraged to use these centers. In our study, only 28.9 percent of pregnant addicted women were using methadone. In comparison with studies such as Australia that 85.6 percent of mothers taking opium were intered methadone treatment programs, Is quite different. (19) This mismatch can be due to Negative thinking consumer pregnant women to judge and deal therapeutic agents, Socio-economic barriers or lack the necessary level of care for pregnant addict women. Women taking methadone demonstrate reduced use of illicit drugs, better compliance with prenatal care, and improved newborn birth. (20)

Therefore It is necessary to pay more attention to individual training in community and insights on methadone maintenance treatment center be improved, so that multiple teams to be institutionalized for treatment. Also, health workers receive adequate training to support this particular group of patients. In addition, most of these women come to the hospital just in time delivery and access to this group becomes more difficult. Perhaps a center for follow-up and care for pregnant addicted women, as in the other countries, Can be helped.

The substance-abusing mother by definition is considered high-risk, with significant exposure for maternal and fetal complications. (21)

Intrauterine exposure to certain drugs may cause congenital anomalies and/or fetal growth restriction, increase the risk of preterm birth, produce signs of withdrawal or toxicity in the neonate, or impair normal neurodevelopment .(22, 23)

our results showed The risk of various congenital anomalies was 5-fold in the group of children born to addicted mothers (p=0.12).In Dr Vucinovic of research, risk of anomalies in babies of pregnant women addicted, were 4 to 6 times the control group (24), In our study, the risk is 5.65. Some other studies have confirmed that the risk of congenital anomalies increased with Drug abuse. (25-27)

In this study, Apgar score of neonates of addicted mothers in the first and fifth minute compared with the control group were significantly different (p=0.01). Richard study showed that the first and fifth minute Apgar in neonates born from mothers addicted to heroin is less than the control group. (28)

Respiratory problems such as apnea, cyanosis, stridor in newborns of addicted mothers compared with the control group was significantly higher (p=0.000) that with Mohammedan and colleagues study is compatible. (29)

Saleh Gargaria and Colleagues study showed that Babies born to mothers in the exposed group were almost twice as likely to be admitted to neonatal ICU (60.2 vs. 31.7; P<0.001), require a longer stay in ICU (4.98 days vs. 3.03; P<0.001) and to die than those born to mothers in the non-exposed group (6.6% vs. 1.9%; P<0.001). (30)

Conclusion

Substance abuse during pregnancy increased the risk of obvious anomalies, respiratory problems, meconial amniotic fluid, admission to NICU, seizure and hypoglycemia in newborn.

We recommend special support and treatment for these high risk neonates.

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