Screening of the Risk Factors for Congenital Anomalies in Pregnant Women Attending Maternity and Obstetric Hospitals at Mosul City

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ABSTRACT

To determine the possible risk factor leading to common congenital anomalies among fetuses and neonatal and assess possibly causes the lead to congenital anomalies A descriptive study (it was cross-sectional) was adopted to achieve the objectives of the current study for the period from October 16 to May 31, 2020. Data were collected from Nineveh Governorate. An objective sample of (120) women who gave birth to children with congenital anomalies in maternity wards was selected in this study. Data were prepared, organized, and entered a computer file; Statistical Package for the Social Science (SPSS, version 26). In a questionnaire for women in maternity wards in maternity hospitals in the city of Mosul, 120 women who gave birth to deformed children were monitored. Most of the risk factors were important in an association between congenital malformations and parental kinship, fever, and maternal nutrition. Malnutrition during pregnancy also shows an association between parental consanguinity and NTD. It was concluded from the available data that there is a significant association between congenital anomalies, parental consanguinity, maternal nutritional status, and high temperature during pregnancy. Support parents who have a deformed baby or are at risk of having a baby with a congenital problem, by doing basic checkups before and during pregnancy to make sure the pregnancy is healthy.

1. INTRODUCTION

An Estimated 6% of babies worldwide are born with a congenital anomaly, resulting in hundreds of thousands of associated deaths. However, the actual number of cases may be much higher because statistics do not often consider terminated pregnancies and stillbirths [1] Worldwide surveys have shown that the birth prevalence of congenital anomalies varies significantly from country to country. It is reported to be as low as 1.07% in Japan and as high as 4.3% in Taiwan [2] In the USA, 2-3% birth prevalence of congenital

anomalies has been reported. The birth prevalence of congenital anomalies in England is 2%, and in South Africa, it is 1.49%. In Lebanon, the incidence of significant congenital anomalies has been reported as 1.64 % in Southern Beirut. The variation in rates may be explained by social, racial, ecological, and economic influences. The most common congenital severe disorders are congenital heart defects, neural tube defects, and Down syndrome [3]. Congenital malformations are considered one of the significant causes of preterm and neonatal morbidity and mortality. Literature suggests the association of various congenital deformities with maternal exposure to air pollutants. However, the evidence is still inconclusive on the manifestation of these during pregnancy. Thus, a systematic review was done on the available epidemiological studies studying air pollutants' effect on congenital malformations. Furthermore, the meta-analysis was conducted for several air pollutants and congenital defects [4], [5]. However, where these defects come from, inherited, and others are harmful environmental factors known as teratogens. Still, others are multifactorial, resulting from a complex interaction of genetic and environmental influences. However, in approximately half of all congenital disability cases, the causes are unknown. Environmental factors that are considered potential risk factors in causing congenital malformation include maternal infection, advanced maternal age, maternal medicines, and substance intakes during pregnancy, such as caffeine, nicotine, maternal nutritional and health status, maternal exposure to hazardous waste, and maternal alcohol intake during early pregnancy. Additionally, parental race, parental socioeconomic status, hyperthermia during early pregnancy and maternal diabetes, and obesity are also considered associated risk factors in causing developmental malformations [6]. Genes play an essential role in many congenital anomalies. This might be through inherited genes that code for an anomaly or resulting from sudden changes in genes known as mutations. Consanguinity (when parents are related by blood) also increases the prevalence of rare genetic congenital anomalies. It nearly doubles the risk for neonatal and childhood death, intellectual disability, and other abnormalities [7]. The Objective of the study is to determine the possible risk factor leading to common congenital anomalies among fetuses and neonatal.

2. Methodology

This a cross-section study design conducted in maternity wards in Mosul obstetrics and gynecological hospitals. All mothers who delivered infants with congenital anomalies within the study period were invited to participate in the study as a study group. A cross-section study design is used. Obstetricians diagnosed congenital malformation at the time of delivery. The study was performed between November 10, 2020, to May 2021 in four Mosul city hospitals. A cross-sectional study was conducted for (120) pregnant women who attended ward birth at four Maternity Teaching Hospitals in Mosul City, Iraq. The questionnaire was designed in English and then translated into the Arabic language. An independent back translation was done, compared with the original questionnaire, and the discrepancies were corrected. The questionnaire is the researcher's way of obtaining data and information related to the study concepts; it Is often used to identify the study populations, explore their behaviors, and discover important information that assists the researcher in carrying out scientific research. When the deformed child is born in the birth ward, and after a clinical examination to prove the deformity, an interview is conducted to fill in the questionnaire if the birth was normal and under the father's supervision or with the help of a family member if the birth It was a cesarean delivery, After 10 minutes, during which information is taken about the mother, father, and the deformed child, the child's weight is known in kilograms using an electronic scale. The type of deformity and vital signs are monitored at birth. The Apgar score was created by Dr. Virginia Apgar, an anesthesiologist at Columbia University, in 1952.

The score is a quick way to evaluate a newborn shortly after birth and in response to resuscitation. The American College of Obstetricians and Gynecologists and the American Academy of Pediatrics recommend Apgar scoring as a measurement form. Color, heart rate, reflexes, muscle tone, and respiration are all

factors in the Apgar ranking. Apgar rating is used to determine if cyanosis, hypoperfusion, bradycardia, hypotonia, respiratory depression, or apnea are symptoms of hemodynamic compromise. Each factor is given a score of 0 (zero), 1 (one), or 2 (two). All infants' scores are reported at 10 minutes. Scores of seven to ten are regarded as reassuring. The information taken from the newborn was written into the questionnaire. Usually, a pediatrician detects heart abnormalities using an echo or sound in the heart. The esophagus and intestine obstruction is demonstrated by conducting a color X-ray by pushing a radioactive dye through the oral gastric tube. The outlet blockage is checked with a thermometer. Newborns with Down syndrome are usually screened more accurately due to the higher structural and functional abnormalities. We used (SPSS) version 26 and we made descriptive statistics such as frequencies and percentage, mean and standard division, as well as using Chi-square test for the categorical variables, and Spearman's parameter to find the relationship between the study variables.

3. Results

Table 1: shows that 50.8% Menarche Age was between (10-13) years old, 75% Menses Duration was between (3-6) days, and 77.5% of mothers didn't use Contraceptive. Table 2: shows that 48.3% of Gestational age was between (38-42) weeks, 74.2% of congenital anomalies didn't discovered during pregnancy, 91.7% of pregnant women were examined twice or more with an ultrasound, 61.7% of Gravida was between (1-4) once, 63.3% the Number of Children a life was between (1-3) child, 71.7% the History of Stillbirths did not exist for pregnant women, 72.5 % of pregnant women didn't have History of Abortions, 92.5% of pregnant women didn't birth twins, and 70.8% of pregnant women did not use Medication. Table 3: shows that 70.8 % of pregnant women used Folic acid in 2nd and 3rd month, 56.7% of pregnant women didn't vaccinated, 68.3% of Maternal nutrition was Variety food, 84.2% of pregnant women didn't have History of chronic disease, 52.5% of pregnant women didn't have fever during gestation, and 67.5% of pregnant women didn't have UTI during gestation, 83.3% of pregnant women didn't have History of congenital anomalies,77.5% of pregnant women didn't have Family history of CA. Table 4 shows that mean of Mother Age (27.12) and SD. (6.856), that mean of Gravidity (3.85) and SD (2.186), that mean of Parity (3.39) and SD (2.186), that mean of Newborn Weight (2975.42) and SD (857.713).

Table (1): Gynecological risk factors for congenital anomalies:

Variables		Frequency	Percent
Menarche Age	10-13	61	50.8
	14-17	59	49.2
	Total	120	100.0
Menses Duration	3-6	90	75.0
	7-10	30	25
	Total	120	100.0
Contraceptive	Don't have	93	77.5
	Hormonal	20	16.7
	IUD	7	5.8

	Total	120	100.0

Table (2): Obstetrical risk factors for congenital anomalies:

Variables		Frequency	Percent
Gestational age	**28-32**	12	10
	33-37	50	41.7
	38-42	58	48.3
	Total	120	100.0
Month of Discover Anomalies	**Not discovered**	89	74.2
	In the first 3 months	1	0.8
	In the second 3 months	14	11.7
	In the last 3 months	16	13.3
	Total	120	100.0
U/S during Gestation	**Not once**	5	4.2
	Once	5	4.2
	Two or more	110	91.7
	Total	120	100.0
Gravida	**1-4**	74	61.7
	5-8	41	34.2
	9-11	5	4.2
	Total	120	100.0
Number of Children a live	**1-3**	76	63.3
	4-6	37	30.8
	7-9	7	5.8
	Total	120	100.0
History of Stillbirths	**Don't have**	86	71.7
	1-3	33	27.5
	4-5	1	0.8
	Total	120	100.0
History of Abortions	**Don't have**	87	72.5
	1-2	27	22.5
	3-4	6	5.0
	Total	120	100.0
Having twins	**Don't have**	111	92.5
	Have	9	7.5
	Total	120	100.0
Type of Medicine	**Don't have**	85	70.8
	Hypertension	14	11.7
	Thyroid	2	1.6
	Anemia	2	1.7
	Other diseases	17	14.2
	Total	120	100.0
Mothers age at fist pregnancy	**30 year or less**	118	98.3
	More than 30	2	1.7
	Total	120	100.0
Mode of delivery	**Normal vaginal delivery**	73	60.8
	Cesarean section	47	39.2

	Total	120	100.0

Table (3): Some of risk factors for congenital anomalies:

Folic acid use	Didn't take	25	20.8
	2nd and 3rd months	85	70.8
	After 3rd month	10	8.3
	Total	120	100.0
Vaccination	Yes all	39	32.5
	Yes, but not complete	13	10.8
	Did not vaccinated	68	56.7
	Total	120	100.0
Maternal nutrition	Variety food	82	68.3
	Didn't eat meet	12	10.0
	Didn't eat dairy	7	5.8
	Didn't eat much	19	15.8
	Total	120	100.0
History of maternal chronic disease	Don't have	101	84.2
	Hypertension	13	10.8
	Thyroid	1	0.8
	Anemia	4	3.3
	Other diseases	1	0.8
	Total	120	100.0
Fever during gestation	Yes	57	47.5
	No	63	52.5
	Total	120	100.0
UTI during gestation	Yes	81	67.5
	No	39	32.5
	Total	120	100.0
History of congenital anomalies	Yes	20	16.7
	No	100	83.3
	Total	120	100.0
Family history of CA	Yes	27	22.5
	No	93	77.5
	Total	120	100.0

Table (4): Mean and standard deviation of the continues variables.

Variables	Mean	Std. Deviation
Mother Age (Years)	27.12	6.856
Marriage Age (Years)	19.10	3.877
Father Age (Years)	32.12	8.917
Menses Duration (Days)	5.38	1.432
Gestation Age (Weeks)	37.16	2.557
Gravidity	3.85	2.314
Parity	3.39	2.186

Number of Live Children	**3.00**	**1.983**
Number of Abortions	**0.46**	**0.839**
Newborn Weight (Grams)	**2975.42**	**857.713**
APGAR Score (10 score)	**7.48**	**2.837**

4. Discussion

Congenital anomalies, often known as birth defects, are prenatal disorders caused by a single gene defect, chromosomal abnormalities, multifactorial inheritance, or environmental teratogens [8], [9]. Neonatal mortality and morbidity are frequently caused by congenital abnormalities. Anomalies in the structure, function, or metabolism of the baby are examples of these anomalies [10]. With the advent of prenatal diagnostic techniques, it is possible to make early detections and offer timely solutions. Anomaly rates can be reduced by using certain preventive strategies. These include folate supplementation (preconceptional and antenatal), avoidance of consanguineous marriage, control of diabetes, and avoidance the risk factors, such as radiation exposure and antimetabolites [11]. The table (1) shows that presents the demographic characteristics mothers of newborns. that 56.7% of mothers were in the age group (15-26), 35% of mothers age were in the age group (27-38), and 8.3% of mothers were in the age group (39-50), the finding in an approach study conducted by [12], which approximately disagrees with the present study finding the age of distribution showed that 39.5% of the mothers were in the age group less than 25 years and that 49.6% of the mothers were in the age group (25-35). In this study shows 10.9% were in the age group mothers (35 years and older) at marriage. 72.5% of mothers were in the ages of (13 or 20) at the time of marriage. in this study shows 50.8% of mothers live in urban and 49.2 % of mothers lived in the rural, the finding of similar study conducted by [13], which approximately disagrees with the present study finding the distribution among showed that 69.11% of mothers live in urban and 30.89% of mothers live in the rural. in this study shows that 95.0% of mothers were housewives, 3.3% were students, and 1.7% were employees. The results of the similar study conducted by [14], [15], partly agrees with the study finding, which found that the profession non-employed 85.1%, professionals 10.7%, clerks 0.4%, service workers and shop and market sales workers 0.4%, skilled agricultural and fishery workers 3.3%. In this study shows 53.3% was the highest percentage of consanguinity among parents' cousins, the percentage results for consanguinity from the same tribe 23.3% equaled with no consanguinity 23.3%. the finding of similar study conducted by [16] 71.1% of Egyptian mothers had the highest percentage of consanguinity among parents' cousins, 18.6% parents consanguinity from the same tribe, and 10.2% no parents' consanguinity. as well as the percentage in the same study of Saudi mothers showed percentage of consanguinity between parents were cousins 78.3%, consanguinity from the same tribe 18.4%, and didn't have consanguinity between parents 3.3%. In this study, 35.8% of mothers were illiterate, 25.8% of mothers read and write, 25% of them completed elementary school, 8.3% completed high school, and 5% had university degrees.

The results of the similar study (17), which Mother's educational level approximately disagrees with the present study finding the distribution among the mothers showed that 12.2% of mothers did not go to school, 45.5% completed primary school, 28.6% completed high school, and 8.7% completed the college, 2.0% obtained a university degree, and 2.9% of whom (not applicable) / refused to answer. In this study 65.0 % of mothers during pregnancy were exposed to passive smokers and 35.0% of them were not exposed to passive smokers. The results of a similar study conducted by [18], which approximately disagrees with the present study, indicated that 20.2% of the participants were active smokers, 42.1% were passive smokers, and 37.7% were non-smoke. The results shows 63.3% of fathers age with in (19-34), 31.7%of

fathers age with in (35-50), 5.0% of fathers age with in (51-66) the finding of similar study conducted by [19], which is disagrees with the present study which finding the age distribution among the 29% of fathers less than 20 years, 27% of fathers age with in (20–24), 21% of fathers age with in (25–29), 18% of fathers age with in (30–34), 15%of fathers age with in (35–39),15% of fathers age 40 or older. The educational level of fathers in this study shows 32.5% of them were illiterate, 6.7% read and write, 26.7% complete elementary school, 19.2% have high school, and 15% hold university degrees, the finding of similar study conducted by (20), which approximately agrees in part of results with the present study which showed that the educational level of the fathers was 9.6% of them were illiterate, 33.1% have a primary education, 31.8% have a high school, 10.5% have finished their university, 3.6% finished their university studies and 11.4% whom (not applicable), or refused to answer. The results that appeared in this study for the father's Occupation were 61.7% workers, 14.2% professions as government employees, 13.3% military employees, 4.2% farmers, and 5% unemployed and 1.7% of them were students. the finding of similar study conducted by (21),which approximately disagrees with the present study finding, found that Paternal Occupations 16.5% professionals, 12.4% technicians and associate professionals, 10.7% clerks, 3.7 % service workers and shop and market sales workers, 17.8% skilled agricultural and fishery workers 26.0%, craftsmen and related trades workers 10.3%, plant and machine operators and assemblers, 1.2 % elementary occupations, 0.8% armed forces. In this study shows that the numbers of the family members were as follows: 58.3% ranged between (3-8) family members, which was the highest percentage, and also 25% ranged between (9-14) individuals, and 16.7% ranged from Between (15-20) individuals, and there was no study that deals with the number of family members.

The results of this study shows that the families of the children were their place of residence in relation to the house as follows: 40.8% owned, 18.3% rent, 14.2% an informal home, and 26.7% lived with a partner. The findings shows that maternal age appeared during the first menstrual cycle 50.8% of mothers were ages with in (10-13), and 49.2% of mothers were ages with in (14-17). In this study, the results shows that the period of menstruation for mothers was for 75% of mothers who spent between (3- 6) days menstruating, while 25% of them spent between (7-10) days menstruating. In this study shows contraception, 77.5% of the mothers in this study were not using contraception while 16.7% were using hormonal contraception and 5.8% of them wore an IUD before their current pregnancy, the finding of similar study conducted by [22], which approximately partly agrees with the present study showed that 51% did not use contraception, while 49% used contraception, 65.30% of them used the IUD, 24.48% used the contraceptive pill, and only 10.2% used the injection. The results shows that 48.3% of gestational age was between (38-42) week, % 41.7 of gestational age was between (33-37) week,10% of gestational age was between (28-32) week, while the finding of similar study conducted by [23] which approximately agrees with the present study finding, showed 68.2% of gestational age was between (37 - 42) week, 26.5% of gestational age was between (29 - 36) week, 5.3% of gestational age was between (23 - 28) week. The following results for the detection of abnormalities during pregnancy with ultrasound appeared in this study, It appeared that 74.2% of congenital malformations were not detected, 0.8% in the first 3 months, and 11.7% In the second three months, and 13.3% in the last three months, where the arithmetic mean = 1.64 and the standard deviation SD = 1.129, The finding of a similar study conducted by (Taboo, 2012)(24), which is almost disagrees with the current study, showed that the arithmetic mean = 30.12. In this study, the frequently of an ultrasound scans during pregnancy appeared as follows: 91.7% checked twice or more an ultrasound scan, 4.2% checked once an ultrasound scan, and 4.2% didn't check an ultrasound scan, the finding of the similar study conducted by [25], which is finding with the current study the number of maternal ultrasound check to be 90% percent and the mothers that didn't check an ultrasound scan 10% percent. In this study, shows the gravida of mothers the highest percentage was 61.7% ranged between (1-4) gravida, 34.2% of mother's gravida ranged between (5-8) gravida, and 4.2% of mother's gravida ranged between (11-9) gravida. the finding of a

similar study conducted by [26], which is disagrees with the current study, showed the number of gravidas was the highest percentage 48.8% mother's (2) gravida, 25.8 % of mothers (3) gravida, and %25.4 of mothers had more than 4+ gravida.

In this study that The percentage of women who have given a birth to live children was 63.3% between (1-3) child, 30.8% of them were between (4-6) child and 5.8% of them were between (7-9) child. the finding of similar study conducted by which approximately disagrees with the present study finding the percentage of women who have given birth to live children distribution 56.1% no living child, 35.5% One living child, 7.7% Two living child, 0.7% Three living child, 0.1% More than four children. In this study, the following results appeared for mothers who have dead children, 71.7% did not have dead children, 27.5% of them were between (1-3) dead children, and 0.8% were between (4-5) dead children. In the results of the study, it was found that 72.5% of the mothers had no history of previous abortion, while 22.5% had abortion range between (1-2) case, and 5.0% range between (3-4) case, the results of the similar study conducted by [25] which approximately agrees with the present study finding The, which found that abortion in previous cases, 66.7% of mothers had no abortion, 31.7% ranged between (1-2) cases, and 1.7% ranged between (3-4) cases. In this study, 92.5% of pregnant women did not give a birth to twins in a previous pregnancy, and 7.5% gave birth to twins in a previous pregnancy, and this statistic was not mentioned in another research. In this study, it was found that 70.8% of pregnant women didn't take medications during pregnancy, 11.7% of them took medications for high blood pressure, 1.6% of them took thyroid medications, 1.7% used medications to treat anemia, and 14.2% used medications to treat other diseases. the results of a similar study conducted by, which is disagrees with the current study, which found that the medications used during pregnancy were 28.7% folic acid, 22.7% anti-HTN, 6.8% vitamin, and 41.6% didn't use any treatment. In this study, it turned out that the mother's age in the first pregnancy was as follows: 98.3% of mothers were 30 years of age or younger and 1.7% of mothers in the first pregnancy were older than 30 years old. no study has shown these percentages. In this study, normal delivery, which accounted for 60.8%, was the highest, while cesarean delivery was 39.2%.

Ethical Clearance- Formal permission from Nursing College at the University of Mosul, The Ethical Research Committee in Nineveh Health Directorate. The College Committee for Medical Research Ethics.The researcher took a written consent from the patients before examination and data collection, then explained all the objectives and procedures to patients.

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