Congenital anomalies in pregnancy after 35 years

Submitted by

Abdullah Qussai Ahmed

Supervised by

Dr. Azal Sadiq

2023-2024

Abstract

Aim of study: To identify the association between the increased maternal age and the incidence of congenital anomalies

Patients and methods: This is a cross sectional study. It was conducted in the period from July 2023 to January 2024. We collected 100 patients who suffered congenital anomalies which attended Al-Batool teaching hospital. We collected information about age, weight, type of congenital anomalies, chronic diseases, etc. we collected the information using prepared written questionnaire and by direct interview with the mothers.

Results: 100 patients with congenital anomalies were enrolled in our study. the majority of the mothers (84%) were housewives and 16% were employees. 52% of the fathers were employees and 48% were free workers. the consanguinity was present in 58% of the cases and in 42% was absent. the most common anomaly was Nervous system anomalies (20%).

Conclusion: we found evidence that there is association between advanced maternal age and the incidence of congenital anomalies.

Introduction

Congenital abnormalities are congenital malformations that are either structural or functional. Given that the average age of conception is higher now than it was historically, birth abnormalities are becoming a significant clinical and public health concern. Congenital malformations can arise from chromosomal abnormalities, single gene mutations, and environmental influences, among other recognized causes. On the other hand, many anomalies have unknown causes. According to reports, congenital anomalies affect about one in every 33 infants. Significant racial variations do not exist in the occurrence of serious birth abnormalities. However, due to variations in social and cultural contexts, there might

be variations in the occurrence of specific birth defects (such as neural tube malformations depending on folic acid dosage). The socioeconomic cost of birth defects is rising as well; in the USA, hospital expenses related to birth defects are projected to be $2.6 billion annually (1).

The percentage of pregnancies attained by women of advanced maternal age (AMA) has been rising during the last 20 years. Multiple pregnancy issues, including spontaneous abortion, hypertension, gestational diabetes, fetal growth restriction, and stillbirth, are more likely to occur in these women. Furthermore, AMA is a known risk factor for chromosomal abnormalities like trisomy 21 because it increases with oocyte age and causes errors in meiotic nondisjunction. (2).

Maternal age has a well-established association with chromosomal abnormalities as well, but the knowledge on its role as a risk factor for non-chromosomal congenital anomalies (NCAs) is far less clear. Though the precise intricacies are still being investigated, it is likely established that maternal age plays a substantial effect in their development. Furthermore, there is inconsistent age distribution of NCAs in the literature. A number of studies indicate that there is an increased risk for either the young (usually defined as under 20 years old) or the advanced (typically defined as 35 years or above); still other studies indicate that there is an effect for both age groups (3).

There is a substantial amount of research outlining how advanced maternal age affects both mother and fetal outcomes. Regrettably, there are contradicting statistics. While some research has linked postponing childbirth to unfavorable results for both the mother and the fetus, other studies have refuted these findings. Obstetric care providers should benefit from current outcome data to improve their preconceptual and prenatal counseling as the number of advanced maternal-age gravidas rises (4).

Aim of study

To identify the association between the increased maternal age and the incidence of congenital anomalies

Patients and methods

This is a cross sectional study. It was conducted in the period from July 2023 to January 2024. We collected 100 patients who suffered congenital anomalies which attended Al-Batool teaching hospital. We collected information about age, weight, type of congenital anomalies, chronic diseases, etc. we collected the information using prepared written questionnaire and by direct interview with the mothers. We preserved the privacy and we coded the patients for the reasons of confidentiality and risk of bias.

Statistical analysis

SPSS Version 25 was used for the description of the data. We expressed the quantitative data by arithmetic mean, standard deviation and mode and the qualitative data by frequencies. Chi square was used to identify the association between the variables when P value less than 0.05 considered significant.

Results

50 patients with congenital anomalies were enrolled in our study. Their gender is demonstrated in table 1.

Table 1. gender

Sex	Frequency	Percent
Male	56	56.0
Female	44	44.0
Total	100	100.0

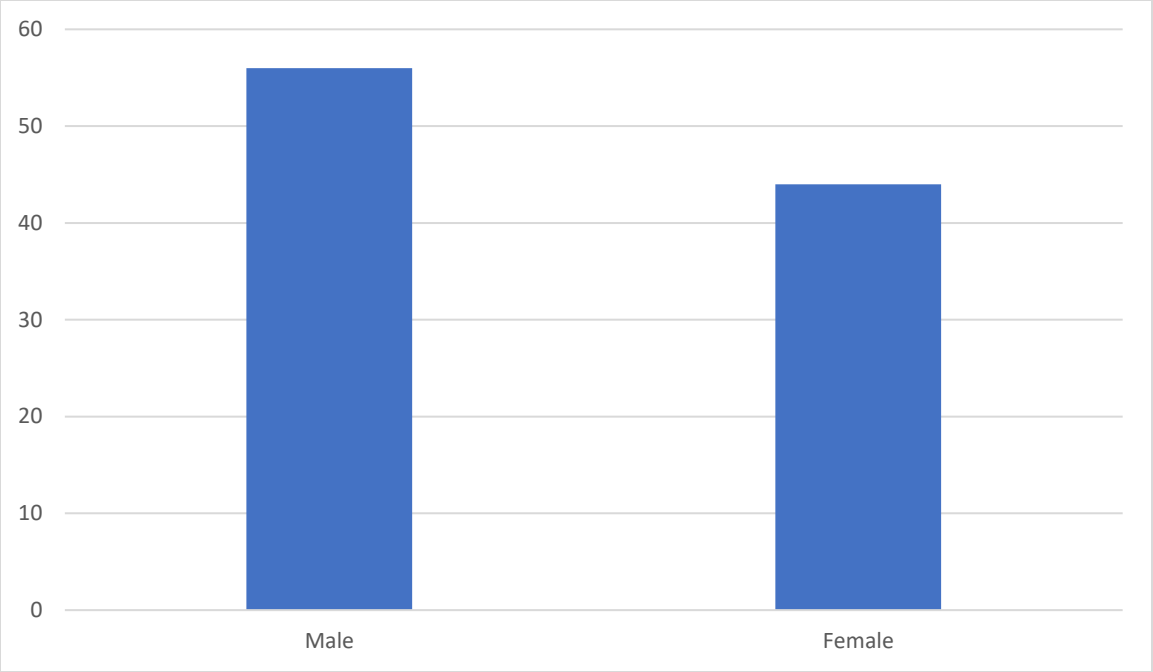

Figure 1. gender

table 2 demonstrate the maternal age groups in our study.

Table 2. maternal age groups

Age groups	Frequency	Percent
< 35 years	48	48.0
> 35 years	52	52.0
Total	10	100.0

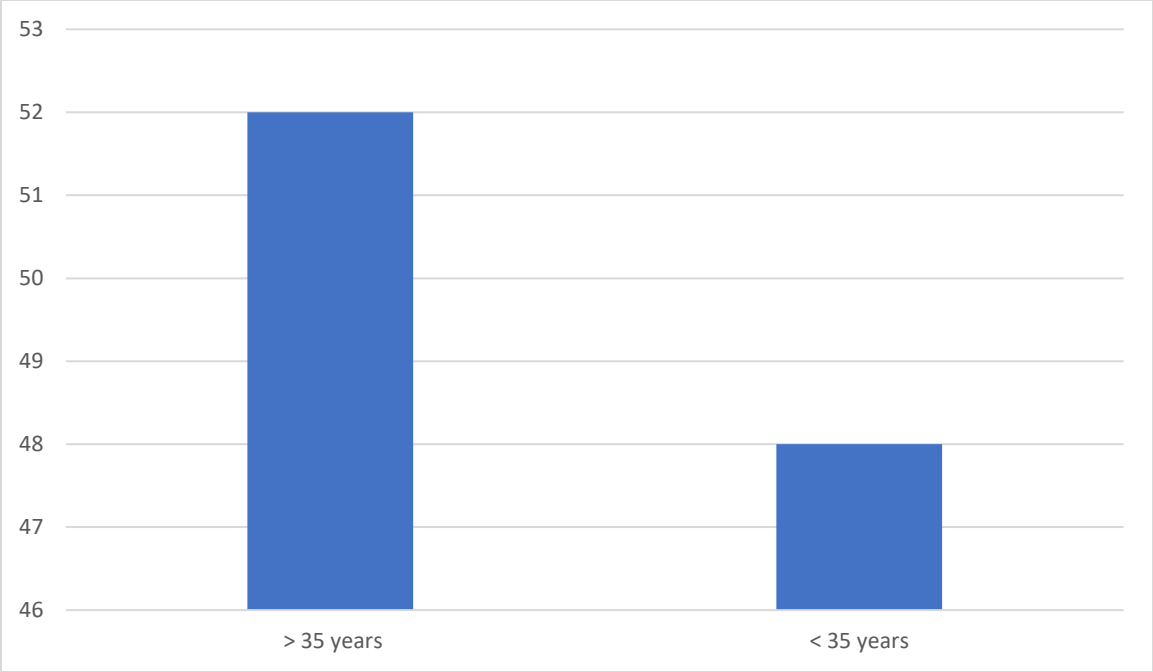

Figure 2. maternal age groups

the congenital anomalies found in our study is demonstrated in table 3.

Table 3. congenital anomalies

Congenital anomalies	Frequency	Percent
Cardiac	6	6.0
CNS	32	32.0
Renal	8	8.0
Down syndrome	10	10.0
GIT	4	4.0

Multiple congenital anomaly	20	20.0
Thoracic	6	6.0
Head and neck	4	4.0
Musculoskeletal	10	10.0
Total	100	100.0

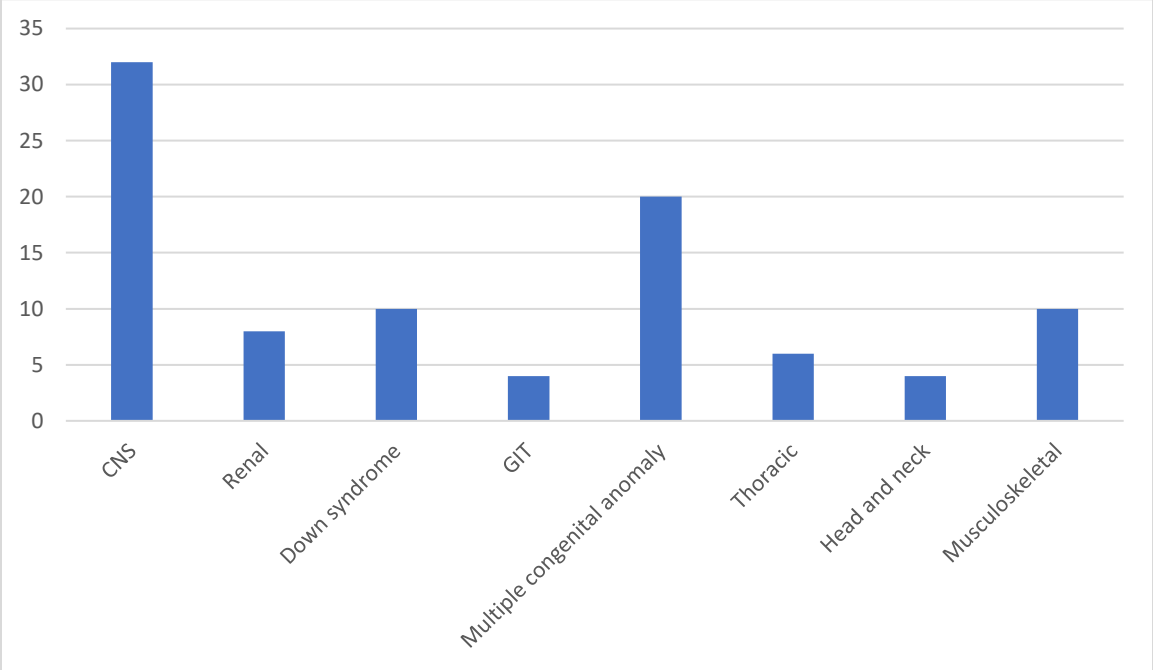

Figure 3. congenital anomalies

the parental occupations are demonstrated in table 4.

Table 4. parental occupation

Occupation		Frequency	Percent
Mother	Housewife	84	84.0

	Employee	16	16.0
Father	Employee	52	52.0
	Freelances	48	48.0
	Total	100	100.0

as shown in table 4, the majority of the mothers (84%) were housewives and 16% were employees. 52% of the fathers were employees and 48% were free workers.

the degree of consanguinity is demonstrated in table 5.

Table 5. the degree of consanguinity

Consanguinity	Frequency	Percent
Present	58	58.0
Absent	42	42.0
Total	100	100.0

As shown in table 5, the consanguinity was present in 58% of the cases and in 42% was absent.

The association between maternal age and the congenital anomalies is demonstrated in table 6.

Table 6. The association between maternal age and the congenital anomalies

Congenital anomalies	> 35	< 35	Total	Sig.
Cardiac	2	4	6	
CNS	14	18	32	
Renal	2	6	8	
Down syndrome	8	2	10	P = 0.047
GIT	4	0	4	
Multiple congenital anomaly	8	12	20	
Thoracic	2	4	6	
Head and neck	4	0	4	
Musculoskeletal	4	6	10	
Total	48	52	100	

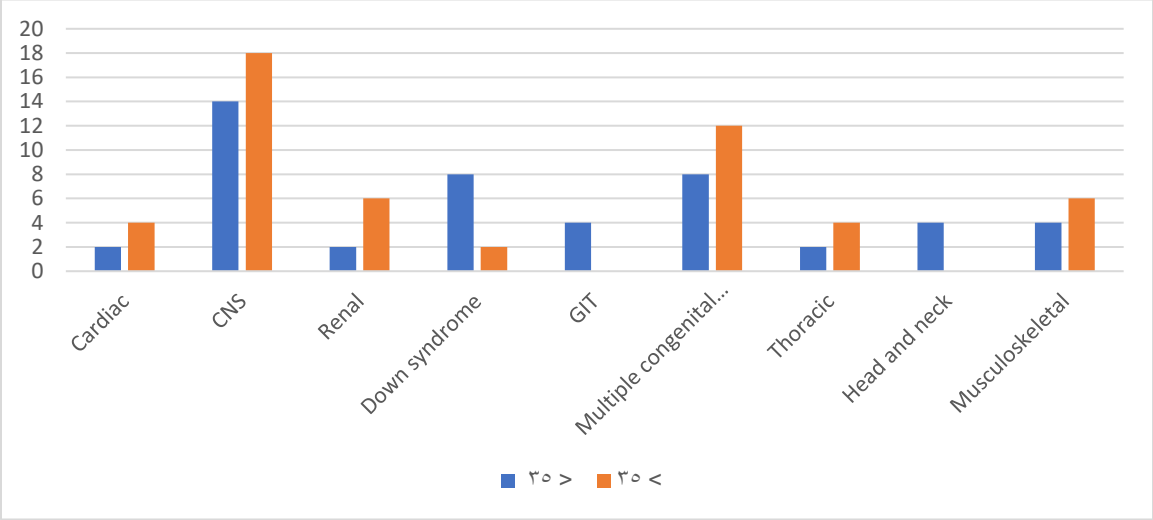

Figure 4. The association between maternal age and the congenital anomalies

Discussion

We found in this study that there is significant evidence, suggesting that older moms had a higher unadjusted risk of having a child with a congenital anomaly. The unadjusted chances of congenital abnormalities in children did not increase for women in the 20-30 year group.

The age distributions of different non-chromosomal anomalies (NCAs) are inconsistent in the literature, despite the topic being actively researched. Paralleling our results, Reefhuis et al. (5) shown that women between the ages of 20 and 35 have a higher chance of carrying a fetus with a neural chord anomaly. After removing the Afro-American population from their data analysis from the California Birth Defects Monitoring Program, Croen et al. (6) also discovered this connection. Other research have demonstrated an association between longer maternal age and an increased risk when examining all NCA groups together.

Growing maternal age has been linked to both a higher and a lower chance for significant congenital defects, according to a number of biological theories. The increased incidence of aneuploidy with age, the build-up of environmental exposures with time, and the rising risk of medical comorbidities, such diabetes, during the reproductive years are among the mechanisms favoring an increased risk. On the other hand, women of advanced maternal age have been shown to utilize prenatal vitamins more frequently, abuse drugs less frequently, and receive prenatal care earlier in pregnancy. These factors may account for the women's possible lower risk of congenital abnormalities (7).

In our study, we found significant association between advanced maternal age and the incidence of congenital anomalies as P value = 0.047.

In our study, 58% of the cases had positive consanguinity which is major risk factor of congenital anomalies most which is likely arises from the homozygous expression of recessive genes inherited from their common ancestors (8).

The overall risk of congenital anomaly, according to literature, was 15% higher in male than female fetuses, but the RRs varied significantly between

subtypes (9). In our study the male were more likely to suffer congenital anomalies which is consistent with findings of Cui et al (10).

Conclusion and recommendation

In literature advanced maternal age is associated with possible congenital anomalies, we found evidence that there is association between them. We recommend conducting more studies with larger sample to either confirm or deny

our findings. We recommend avoiding pregnancy after 35 years old, avoid delaying the pregnancy and to complete the family before 35 years old.