

# STUDY THE RELATION BETWEEN ADVANCED MATERNAL AGE AND THE PREGNANCY OUTCOME <sup>+</sup>

دراسة العلاقة بين تقدم عمر الحامل ونتائج الحمل

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## Abstract :

Data collected from delivered women in (Azadi and Kirkuk- General hospitals ) from the beginning of January / 2000 till the end of December / 2003 to detect the relation between advanced maternal age and the pregnancy outcomes and the main complications that may occur during pregnancy and delivery.

The total number of delivered women collected was (9725) and it was divided into ( 2 ) groups according to the age , the first one include all women with age below ( 40 ) years (9387) and the second group was the women above age of (40) years (338) The study showed that women above 40 years of age were more prone for caesarian section delivery (215- 63.6%) ,post partum bleeding (245- 72.9%) and abnormal fetal presentation either breech ( 161-47.6%) or transverse (139-41.2%).Genetic abnormalities especially ( Down- Syndrome ) is increased with advanced maternal age mainly (above 40 years of age – 64.2 %)

Key words : maternal age , pregnancy outcome, obstetrical complications .

## المستخلص :

تم جمع البيانات من الولادات المسجلة في ( م آزادي و م. كركوك العام ) في مدينة كركوك للفترة من بداية شهر كانون الثاني / ٢٠٠٠ ولغاية نهاية شهر كانون الأول / ٢٠٠٣ للتحري عن العلاقة بين تقدم عمر للمرأة الحامل ونتائج الحمل مع تحديد أهم المضاعفات التي يمكن إن تحدث أثناء الحمل والولادة كان مجموع الولادات المستحصلة ( ٩٧٢٥ ) وقد قسمت هذه الولادات إلى مجموعتين ، المجموعة الأولى شملت النسوة ذوات الأعمار تحت ( ٤٠ ) سنة ( ٩٣٨٧ ولادة ) إما المجموعة الثانية فشملت النسوة اللواتي كانت أعمارهن أكثر من ( ٤٠ ) سنة ( ٣٨٨ ولادة ) .

أوجدت الدراسة بان النسوة اللواتي تزيد أعمارهن عن ( ٤٠ ) سنة معرضات لحدوث العمليات القيصرية ( ٢١٥ - ٦٣,٦ % ) مع تغير وضعية الجنين إما إن يكون جالسا ( ١٦١ - ٦,٤٧ % ) أو مستعرض ( ١٣٩ - ٢,٤١ % ) مع حدوث النزيف الرحمي بعد الولادة ( ٢٤٥ - ٧٢,٩ % ) تزداد التشوهات الخلقية مع تقدم عمر الحامل بعد ( ٤٠ ) سنة وخصوصا متلازمة داون ( ٦,٦٤ % )

مفاتيح الكلمات :- عمر المرأة الحامل ، نتائج الحمل ، الولادات ، مضاعفات الولادة

## Introduction :

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There is no universal definition of advanced reproductive age in women. Subfertility is more pronounced after age of 35 and advanced maternal age typically refers to a pregnant woman who will be > 35 years of age on the estimated date of confinement. However the effects of increasing age occur as a continuum rather than threshold effect.[1]

Some defined higher risk pregnancy as :-

( That pregnancy in which the women have more chance to develop chromosomal abnormalities like trisomy 21, trisomy 31, trisomy 18 ) [2]

The maternal age effect describes the exponentially increasing risks for numerical chromosomal abnormalities among her gametes as a prospective mother age, This increase reflects the overall increase in the rate of non disjunction with maternal age [3.4]

In today's society, it has become more common place for women to consider pregnancy at age (35) or older for a variety of reasons. Some have pursued education, careers, or have married later in life than women did decades ago., and some are simply choosing to have one more baby in their lifetime, even after one or two previous pregnancies[5]

Infertility problems are more prevalent as a woman gets older, yet technology has helped many women succeed in achieving a much desired pregnancy [6]

Statistically, there are more pregnant women over the age of (35) than in any other era health care providers have traditionally viewed any woman over the age of (35), especially one having her first pregnancy, as a high risk patient.

Age alone does not predict risk, but several life style factors, such as family history, socioeconomics, and demographics have a major impact on the well being of the mother and infant).[7]

The number and spacing of previous pregnancies, genetics of the parents, nutritional status and prenatal care of the mother also play an important role in the pregnancies of older women. It is imperative, for all of these reasons, that benefits and risks for the mother and the baby be considered [8]

### **Aim of the study :**

This study aimed to :-

- 1- Evaluate the risk factors associated with advanced maternal – age .
- 2- Analyze the relationship between maternal age and the outcome of pregnancy
- 3- Demonstrate the main possible preventive measures to avoid these factors .

### **Subjects and methods :**

Hospital records of ( 9725 ) women who delivered in ( Kirkuk – general hospital ,A zadi hospital and birth certificate ) during the period of January /2000 - till the end of December / 2003 ) to detect the main risk factors and variables of interest included ( women age , parity , mode of delivery , presenting part , lie of the fetus , ant partum hemorrhage , and post partum hemorrhage

Statistical calculation of the data obtained about the maternal age of the women who attending these hospitals for detection the type and mode of delivery ..

Other important information was conducted from these hospitals about the presentation of the fetus during labor either ( cephalic , breech , or transverse lie ) and the other complications which was occurred like ante partum bleeding and the association of chromosomal abnormalities especially Down- syndrome ) with the advanced maternal age

All these information were tabled into many tables and figures according to the results obtained and statistical analysis of these results to detect any significant relation ship between these variables and risk factors

The delivered women were classified into groups according to maternal age at delivery to (35-40) , (> 40 ) years old . Women aged < 18 were excluded from the analysis , the frequencies of the various outcomes of pregnancy in the maternal age groups were calculated and multiple logistic regression models were then constructed to examine the magnitude and significance of the independent effects of age

### **Results and Discussions :-**

**Table -1-Distribution of the total deliveries through the years studied**

Year	Number of deliveries	Percentage
2000	1425	14.6
2001	2535	26.0
2002	2005	20.6
2003	3760	38.8
Total	9725	100.0

Table -1- presents the distribution of total deliveries from the beginning of 2000 till the end of 2003 which show that there is an increase in the deliveries especially in 2003 ( 3760- 38.8%) because of the recent evidence in the war which is occurred and lead to changing the main attitudes and beliefs towards birth delivery in the hospitals and the main protection factors from delivery .

Regarding the total number of the delivered women , which was collected from the beginning of 2000 till the end of 2003 that show much higher deliveries in the last year (2003) due to more attention towards the hospital deliveries than home deliveries , in addition to that , increase in the educational level of Iraqis people for ante- natal care and the safety delivery in the hospitals rather than home delivery which resulted in many complications that lead to death of baby or the mother or both of them .

**Table -2-Age Distribution of the studied mothers**

Age of the delivered woman	Number	Percentage
Below (40) of years	9387	96.6
Above (40) years	338	3.4
Total	9725	100.0

table -2 show the classification of total delivered women according to the age groups which are group (1) presents the women aged below (40) years who are constitute ( 9387- 96.6%) and the second group include all the women aged above (40) years ( 338- 3.4%). Which indicate that old age factor have a relative role in the delivery either because of the late marriage of old women or due to socio- economic factors, [8]

Now days , pregnancy and delivery in old age women become more easy and safe because of the modern technology in all aspects of life including the treatment of chronic

diseases that may occur during pregnancy like (Hypertension , Diabetes mellitus and other diseases of Kidney and heart ) [8.9]

Many women today are waiting until later in life to have children , in the united states , birth rates for women in their 30s are at the highest levels in three decades , however , an older mother may be at increased risks for miscarriage , birth defects and pregnancy complications among the type of delivery between the total number of women aged above (40) years [10]

**Table -3-Distribution of the total delivered women according to the mode of delivery**

Age group of delivered women	Caesarean section		Normal vaginal delivery		Total	
	Number	Percentage	Number	Percentage	number	percentage
Below (40) years of age	343	3.6	9044	96.3	9387	96.5
Above (40) years of age	215	63.6	123	36.3	338	3.5
All	558	5.7	9167	94.2	9725	100

2  
 $X = 214.67$   
 $DF = 2$   
 $P < 0.05$

Table -3- presents the mode of delivery among the studied women which show about two thirds most of the women above age of (40) delivered by caesarean section (215-63.6 %) while the women with the age below (40) of age delivered normally ( 9044-96.3 % ) .

Women above (40) years of age were more prone to delivered by caesarian section than those women below (40) years of age , this is due to deterioration of the myomerterium muscular function of the old age women and weakness of the uterine muscles that loss its ability for normal contraction to vaginal delivery and lead to more complications like vaginal bleeding and abnormal fetal presentation ..[11,12]

During pregnancy , the uterus increase from about (70) mg to a nearly one kilogram , and most of the increase is due to growth of its muscular wall in which the fibers increase in length , thickness and number [13]. the connective tissue components of the wall increase and the endometrial cells enlarge and accumulate glycogen to become later on a deciduas [13,14]

The published data on the risks associated with child birth at > 35 years are inconsistent , [15,16]

It is known that older women are more likely to have pre- existing medical disorders such as Diabetes Mellitus or hypertension .

Some studies have demonstrated an increased incidence of ante partum hemorrhage , Mal presentation ,and operative vaginal delivery .[17,18]

During age process , these mechanisms will be decreased and deteriorated with little response to hormonal sections from the uterine wall and in addition to that the ovary will atrophied and show degenerative changes after middle age of life [19,20] .

**Table -4-Distribution of deliveries according to the bleeding occurrence**

Age group	Post partum bleeding		No bleeding		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Below (40) Of age	1375	14.6	8012	85.4	9387	96.5
Above (40)	245	72.4	93	27.6	338	3.5

of age						
All	1620	16.6	8105	83.4	9725	100

$\chi^2 = 832.25$   
 DF = 2  
 P < 0.05

Table -4- indicates that bleeding during delivery or after it (**post partum bleeding** is more common among those mothers (above 40 years of age) and this bleeding either due to placenta – previa or – placenta abruption which are mainly happened for women above age of (40) years (254- 72.4%) while there was a less complication or bleeding for women below age of (40) of years ( 8012- 85.4%). [20]

The bleeding which is regarded as one of the main complications that may occur during the second stage of delivery or even after that (**post- partum bleeding** ) as shown in table -4- which is either due to placenta previa and placental abruption that happened for women aged above (40)

years .and this is agreed with the same study done by (14) in Nova Scotia found that the risk of bleeding is increased with the advanced maternal age which is accepted for occurring either placenta previa and placental abruption which indicate that there is a strong relation with the maternal age and parity because multi pares have a more chance for bleeding during delivery while there is no any association between the bleeding which is occurred in women below age of (35) years [20]

**Table -5-Distribution of the total delivered women according to the fetal presentation**

Age group of the delivered women	Cephalic presentation		Breech presentation		Transverse Lie		Total	
	number	%	number	%	number	%	Number	%
Below age of (40) years	9061	96.5	221	2.3	105	1.2	9387	96.5
Above age of (40) years	38	11.2	161	47.6	139	41.2	338	3.5
All	9099	93.6	382	3.9	244	2.5	9725	100

$\chi^2 = 480.53$   
 DF=2  
 P < 0.05

Regarding the fetal presentation during delivery which is shown in table -5- , there is quite difference between the two groups because in the women aged cephalic presentation is the commonest one ( 9061- 96.5 %).

there is a quite difference between the two groups because cephalic presentation which is regarded as a normal one , is most prevalent among women aged below ( 40) years while in group two in which the women aged above (40) years of age , there is more breech and transverse position that is due to enlarged uterus and then become shrinks with atrophied mucosa and disappearance of the glandular tissue and it may be converted with advancing age to fibrous mass which affect the growth and presentation of the fetus during delivery.[ 21]

**Table -6- Distribution of delivered women according to the frequency of genetic abnormalities ( Down- syndrome )**

Age group of the delivered women	Positive genetic abnormality		Negative genetic abnormality		Total	
	Number	%	Number	%	Number	%
Below age of (40) years	1254	13.3	8133	86.7	9387	96.5

Above age of (40) years	217	64.2	121	35.8	338	3.5
ALL	1471	15.2	8254	84.8	9725	100

2  
X=658.43  
DF=2  
P<0.05

Women above (40) years of age have more chance for developing genetic abnormalities than women below age of (40) years (217 - 64.2 %), as shown in table -6-

For the genetic abnormalities that occur, there is more tendency towards (Down- syndrome) which is more in women above age of (40) years or these results are agreed with another research conducted by Fisch TP -2004 (16) who showed that paternal age has a negligible effect up to the age (35). Over the age of (35), paternal effect is seen in conjunction with a maternal age of over 35 and was most pronounced when maternal age was 40 or over. and he referred to the women's ova only divide a total of 24 times throughout the life, the first 23 of which happen in utero, where as means sperm divide continuously throughout life leading to gradually increasing copy errors, which is trisomy 21 that is derived from maternal age effect because of an error when the egg splits [22]

The risk of having a baby with chromosomal abnormalities increases with maternal age –(11) that indicate the main risks for down syndrome which is one of the most commonest chromosomal birth defects as well as the over all risks for having a baby with any type of chromosome abnormality, including Down – syndrome. in addition to that the risk of fetal congenital anomalies increase with maternal age despite ante- natal care screening and its occurrence is remain the most commonest type of abnormalities [23].

**Table -7-Risks for chromosomal abnormalities by maternal age**

Maternal age	Down- syndrome	Any abnormality
15-24 years	1/1300	1/500
25-29years	1/1100	1/385
35years	1/350	1/178
40years	1/100	1/63
45years	1/25	1/18

Down – Syndrome results from a triplication of auto some 21 so the patient having a total chromosomal set of (47) in stead of (46), it is occur in about (1.5) per 1000 new born infants and many of them don't survive to term, on the other hand the explanation of Down Syndrome is duo to no oocytes are formed after birth and those which are shed in the later stages of reproductive life may be 40 or more years old [24].

Genetic testing is a standard of care offered to any women 35 or older, duo to potential increased risk, this should be a completely informed choice for the women and her partner, the standard tests is (Expanded AFP Screening) which is a simple test preformed between (15-20) weeks of pregnancy to estimate her own personal risk for carrying a fetus with Down – syndrome this test also provides a good information about the presence of neural tube defect

The delivered women were classified into groups according to maternal age at delivery to, (35-40), (> 40) years old. Women aged < 18 were excluded from the analysis, the frequencies of the various outcomes of pregnancy in the maternal age groups were calculated and multiple logistic regression models were then constructed to examine the magnitude and significance of the independent effects of age [25]

Lastly some governments have sometimes taken actions to regulate or restrict later in life child bearing while Whitley –E and d Doyle – Roman said in 1999 ( Immoral as well as dangerous to the health of mother and child ) but in Italy , the Association of medical Practitioners and Dentists prevented its members from providing women aged (50) and over with fertility treatment while National Council of the Federation of Doctors would not allow any one but married heterosexual couples to undergo artificial insemination).[22,25]

### **Conclusions:**

- 1- Increased maternal age is associated with the increased obstetrical problems in comparison with other age groups
- 2- More caesarean section deliveries among women aged above (40) years and increase the number of vaginal deliveries below age of (40) years
- 3- There is more complications for women above age of (40) years like bleeding and others than women below age of (40) years
- 4- Increase the risk of abnormal fetal presentation like (breach and transverse position)for women above age of (40) years than women below age of (40) years
- 5- Increase the risk of chromosomal abnormalities (Down- Syndrome) among women aged above (40) years of age

### **Recommendations :**

- 1- Regular checking for women aged above (40) years through family clinics and ante- natal care clinics to detect any abnormalities during pregnancy .
- 2- More concentration for women above age of (40) years regarding regular observations for the pregnant women and fetal position with the other complications that may occur during pregnancy
- 3- Additional healthy facilities for pregnant women especially those above (40) years of age like periodic examination and medical consideration to discover any abnormalities in the early pregnancy
- 4- Pre- pregnancy counseling and intensive ante- natal care assessment is necessary for women aged above (40) years
- 5- Educational approach for women aged above (40) years towards the medical observation through out the pregnancy to exclude any complications that may happened
- 6- Adequate informative programs about the main risks that occur during pregnancy mainly for women aged above (40)\_ years
- 7- Family history and genetic counseling with periodic assessment before pregnancy

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