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Relation between Mother Age and Pregnancy Outcome and Neonatal Outcome

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Abstract: **In the past decades delayed childbearing has become increasingly and become common in both high- and low income countries. In the recent years, there is a significant growth in mean maternal age at first childbirth. The percentage of live births to women aged 35 and over has increased almost twice from 9.1% in 2005 to 16.3% in 2016. And also at the same time, the rates of deliveries among mothers over 40 rose from 1.8% in 2005 to 2.6% in 2016. The study aimed to investigate relation between mother age and pregnancy outcome and neonatal outcome in the Department of Obstetrics and Gynaecology, at Sohag University hospital. Design: A descriptive design was used for the study. Sample: - included 300 women, their ages was above the age 35 years and older. Tools: A structured self administered questionnaire was used for data collection. Results: from a total 300 elderly pregnant mothers, mother' age ranged from 35 - 45 years, most of the pregnant mothers were in the age group 35 to 39 years (87.53%). Multi gravida was (71%) and grand multi para (20.22%) was constituted the largest group. Most of the pregnant mothers were belong to lower socio-economic status (90%). The incidence of pregnancy complications such as, diabetes mellitus and chronic hypertension among pregnant mothers were increased and cesarean rate was increased (34%). Incidence of abortions was (9.12%), preterm delivery (6.25%), oligohydramnios (6.25%), APH was (6.25%) and PROM (5.90%), low birth weight baby (13.19%), NICU admission (6.94%), IUGR (3.81%) all of these were high. Preference of pregnant mother for male child (23.95%) and lack of awareness (21.52%) were the two major reasons for the continuity of pregnancies and deliveries until late age. Conclusion: There was increasing in pregnancy complications and adverse fetal outcomes among older pregnant women more than 35 years. Recommendations: Older Women should be encouraged to do prenatal screening and prenatal diagnosis, use of ante partum testing to ensure safe motherhood and a healthy fetus. Young mother should be educated about the risks of delayed child bearing at older age that increase the risk of both early and late complications of pregnancy.**

Keywords: **mother age, pregnancy, outcomes.**

1. INTRODUCTION

Advanced maternal age is considered to be 35 years or older, it has been changed to the age of 40 and is defined also as older than 40 or 45 years. The effect of maternal age on obstetric and neonatal outcomes has been become more common in both developed and developing countries over the last decades and studied in various parts of the world and with variable results **(Traisrisilp and Tongsong, 2015)**.

Maternal age generally after 35 years at the time of delivery implies decreased fertility and increased risk. The common causes of pregnancy with advanced maternal age are different such as poor socio-economic status, lack of contraceptive knowledge, religious issues, desire for male child, concept of large family and women conceiving from marriage to menopause (**Kenny et al., 2013)**.

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In the past decades delayed childbearing has become increasingly and become common in both high and low income countries. In the recent years, there is a significant growth in mean maternal age at first childbirth. The percentage of live births to women aged 35 and over has increased almost twice from 9.1% in 2005 to 16.3% in 2016. And also at the same time, the rates of deliveries among mothers over 40 rose from 1.8% in 2005 to 2.6% in 2016 **(Ben et al., 2016 and Ogawa et al., 2017)**.

Many reasons for delayed childbearing can be identified. Among them, the most significant one seems to be a progress in assisted reproductive technologies (ART) such as, in vitro fertilization, oocyte donation, which women in their 40s, 50s or even 60s to become pregnant **(Ciancimino, et al., 2014)**.

Access to ARTs and tendency to childbearing cause the creation of new definitions as very advanced maternal age (VAMA) , extremely advanced maternal age (EAMA) describing women delivering at age 45-49 and ≥ 50, respectively **(Wang, et al., 2011)**.

Higher educational level among females led to a better knowledge and awareness of different types of contraception and, together with greater access to birth control methods, constitutes another factor responsible for an increase in maternal age **(Kalayci, et al., 2017)**.

Pregnant women can be at risk because maternal age that leads to maternal and fetal risk, as chronic hypertension, diabetes mellitus, subfertility, miscarriage, ectopic pregnancy, anemia, antepartum hemorrhage, malpresentation, postpartum hemorrhage which increase the incidence of instrumental deliveries and cesarean sections. Also Fetal and neonatal risk is high due to increased incidence of chromosomal abnormalities (common Down's syndrome), multiple pregnancy, IUGR, prematurity leading to higher number of NICU admission **(Laxmy and Beena, 2013)**.

Majority of these studies give impressive findings about adverse association of age and pregnancy outcome and neonatal outcome and becomes clinically important **(Ben, et al., 2016)**. The association between adverse perinatal outcomes and maternal age has been a controversy in several studies. Some researchers have noted an increased rate of adverse pregnancy and fetal outcomes in women older than 35 years **(Wennberg, et al., 2016)**.

Hence, the present study was conducted to investigate relation between mother age and pregnancy outcomes and neonatal outcome in the Department of Obstetrics and Gynaecology, at Sohag University hospital.

Significance of the study

Delayed childbearing has become increasing nowadays and it believed to be associated with an increased rate of obstetrical and perinatal complications as well as adverse pregnancy and fetal outcomes. Pregnant women in advanced maternal age are at greater risk of congenital disorders, placenta previa, ectopic pregnancy, spontaneous abortion, still birth, and preterm birth, induction of labour, caesarean delivery and small for gestational age (SGA) **(Waldenstrom, et al., 2015)**.

Chronic medical conditions (e.g. diabetes mellitus, hypertension) and other diseases have a possible effect on the course of pregnancy that becomes higher among older patients **(Johnson, et al., 2012).** And because multiple studies suggest that, there is an increasing in the incidence rate of perinatal complications only begins to increase after the age of 35**(Wielgos, et al., 2015).**

Aim of the study

The aim of this study is to investigate relation between mother age and pregnancy outcomes and neonatal outcome in the Department of Obstetrics and Gynaecology, at Sohag University hospital

Research questions:

Is there is a relationship between relation between mother age and pregnancy outcome and neonatal outcome?

2. MATERIALS AND METHODS

Research design:-

A descriptive design was used in the present study.

Setting:

The study was conducted at in the Department of Obstetrics and Gynaecology, at Sohag University hospital

Subjects:

Purposive sample was used in this study, the study sample included 300 women**;** they were recruited within a period of 6 months (from January to June 2019). The inclusion criteria were: their ages was above the age 35 years and older, who are available at the time of the study at selected hospital and who are willing to participate in the study.

Tools and techniques of data collection:-

It was developed by the researcher after reviewing related literatures. There was one tool used in the current study as the following:

Tool (1):- A **structured self administered questionnaire:** It was composed of two parts:

Part (1): it includes personal data related to age, educational level, occupation, residence.

Part (2): Includes obstetrical history such as, parity, medical history, pregnancy outcome, causes of delayed pregnancy, pregnancy complications and perinatal outcome and neonatal outcome.

Tool validity:

Content validity of the tools was determined through an extensive review of literature about relationship between relation between mother age and pregnancy outcomes at the Department of Obstetrics and Gynaecology, at Sohag University hospital

. The content of the data collection tools was submitted to a panel of five experts in the Obstetric health nursing with more than ten years of experience in the field. No modifications of the tools was done according to the panel judgment on clarity of sentences, appropriateness of the content, sequence of items, and recording of the items.

Tool Reliability

The tools reliability was estimated through using the Pearson correlation coefficient test to compare between variables. The Pearson correlation coefficient for the variables ranged between ($P. < 0.5$) and ($P. < 0.001$), which indicated a highly significant positive correlation between variables of the subjects. The findings from the validity and reliability suggested that, the tools of the study could be used as valid and reliable data collection tools for the current study.

Methods of data collection:

- An official permit was taken from Sohag University Hospital administrators and the manager of the Department of Obstetrics and Gynaecology. Permission also was obtained from the head nurse of the Department of Gynecology & Obstetric to gain her cooperation. A clear explanation was given about the nature, importance and expected outcomes of the study to administrators.

Ethical consideration: -

All women were informed about the aim of the study, its benefits, and data collection tools in order to obtain their acceptance and cooperation. The researchers informed them that the participation in the study is voluntary; they have the right to withdraw from the study at any time, without giving any reason and that their responses would be held confidentially.

Review of current and past

Local and international literature related to the research task was made so as to be oriented with relevant research articles and magazines. It was done at the Department of Obstetrics and Gynaecology at Sohag University hospital in Egypt; hence this review was helpful in developing the data collection tools used.

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Pilot study:

It was carried out on 10 % of the women, for the purpose of modification and clarification and estimation of the time needed for data collection. The designed tool was tested on women. Those who shared in the pilot study were being included from the study sample.

Study period:

Data was collected from January to June 2019 after obtaining the permission from the authorities.

Field work:

- The women were informed about the purpose of the study, and confidentiality of data.
- The researchers visited the place two times weekly to collect the data from 9.00 a.m. to 12.00 p.m.
- The researchers was introduced herself to the mothers and the purpose of the visit and the way of the interview was explained to them. A direct interview was done by the researchers themselves with each woman separately and privately using a questionnaire composing of questions regarding their socio – demographic characteristics, medical history and causes or delay pregnancy.
- The interview was carried out in at the Department of Obstetrics and Gynaecology at Sohag University hospital in Egypt.
- The average time spent by mothers for completion took around 20-25 minutes.
- Researchers faced the women and asked them the questions in Arabic and recorded their answers in the structured interviewing questionnaire sheet.

Statistical analysis:

Data was collected and analyzed by the computer program SPSS" version. "21" Chicago. USA. Data expressed as mean, standard deviation and number, percentage, so nonparametric methods were used. Mann Whitney U test, Kruskal-Wallis test and was used Person's correlation used to determine significance between variables in same group. N.s $P > 0.05$ no significant, * $P < 0.05$ significant, ** $P<0.001$ moderate significance and *** $p<0.000$ highly significance.

3. RESULTS

Table (1): Percentage distribution of studied mothers according to their demographic characteristics

Items	No	%
1-women ' age in years		
Range	35 - 45 years	
- 35 < 39	264	88.0
- ≥ 40	36	12.0
2- women ' education		
- Illiterate	15	5.0
-Read and write	60	20.0
-Primary education	57	19.0
-Secondary education	93	31.0
-University education	75	25.0
3-Occupation		
House wife	237	79.0
Worked	63	21.0

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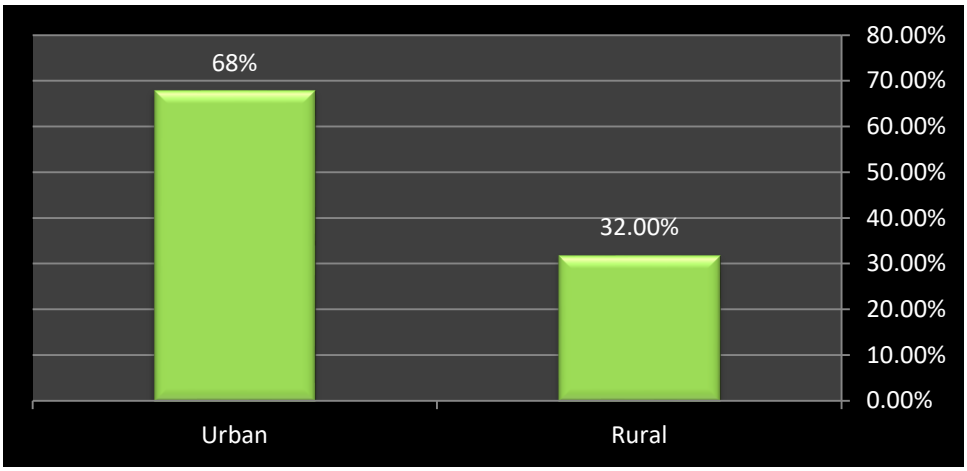

Figure (1): Percentage distribution of studied mothers according to their residence

Table (2): Percentage distribution of studied mothers according to their obstetrical history of mothers

Item	Total (300)	
	No.	%
Parity		
- Primigravida	27	8.88
- Multigravida	213	71.0
- Grand multigravida	60	20.22
Medical history		
- Yes	90	30.0
- No	210	70.0

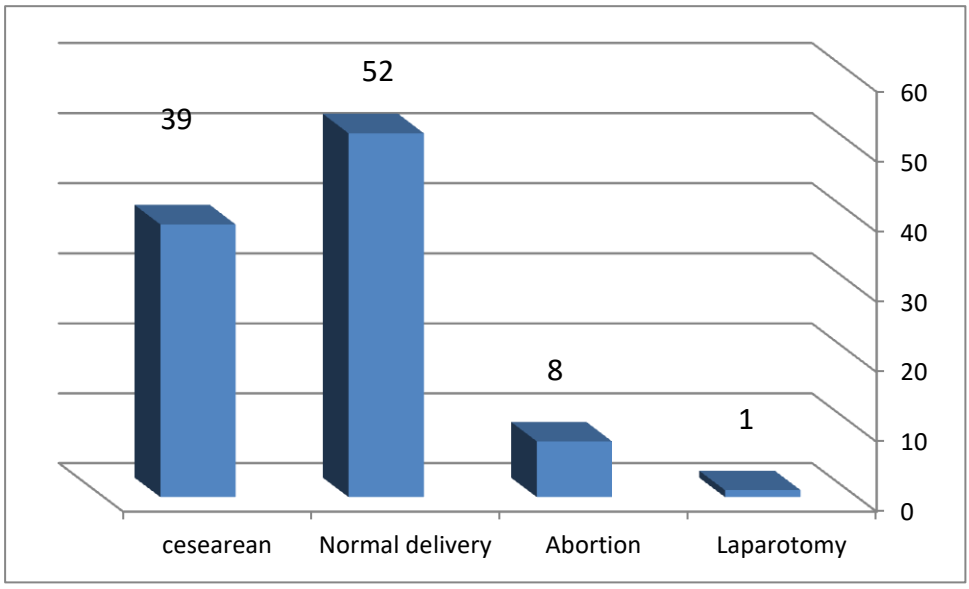

Figure (2): Percentage distribution of studied mothers according to pregnancy outcome

Novelty Journals

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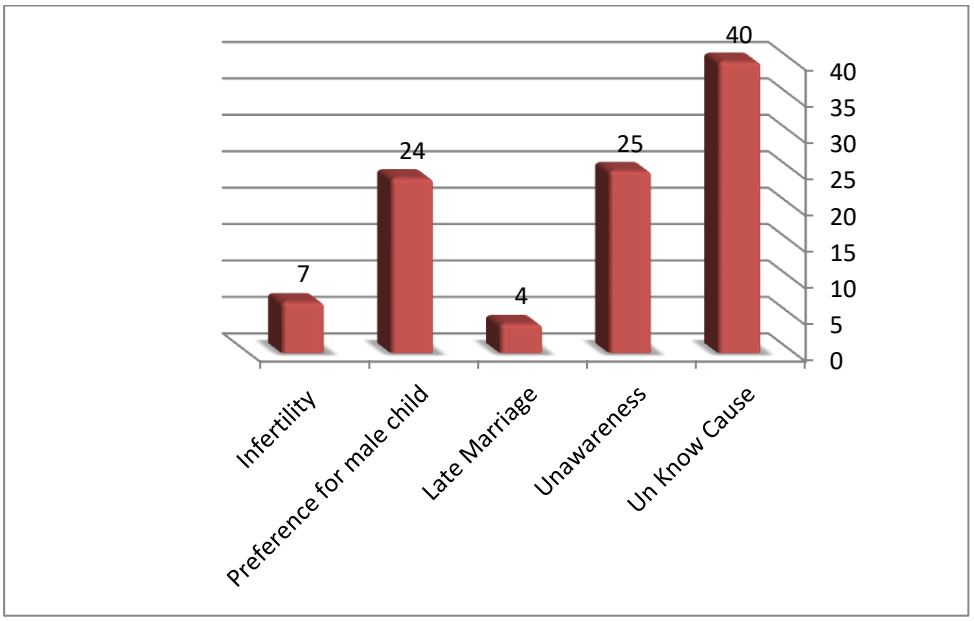

Figure (3): Percentage distribution of studied mothers according to their cause of delay in the pregnancy

Table (3): Percentage distribution of studied mothers according to pregnancy complications

Pregnancy complications	%	No.
Uneventful outcome	50.0	150
Abortion	8.0	25
Ectopic pregnancy	1.0	3
Eclampsia	4.0	14
Anemia	6.0	19
Gestational diabetes	1.0	3
Pregnancy induced hypertension	5.0	17
Preterm delivery	9.0	28
Oligohydramnios	5.0	15
Malpresentation	4.0	13
Twin delivery	2.0	6
Premature rupture of membrane	3.0	10
Antepartum hemorrhage	3.0	10
Postpartum hemorrhage	2.0	6

Table (4): Percentage distribution of studied mothers according to perinatal outcome and neonatal outcome

Items	%	No
Perinatal outcome		
Neonatal ICU Admission	8.0	24
Intra Uterine Growth Retardation	2.0	6
Uneventful Outcome	90.0	270
Neonatal outcome		
Birth weight (kg)	15.0	45
Macrosomy	12.0	36
SGA	23.0	69
LGA	22.0	66
APGAR score : - at < 7 1st min - at < 7 5th min	 12.0 5.0	 36 15
Congenital anomalies	11.0	33
Stillbirth	0.0	0.0

Novelty Journals

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Table (5): relation between mother 'age and perinatal outcome and neonatal outcome

perinatal outcome and neonatal outcome	Mother 'age				p- value
	35 < 39 (N= 264)		≥ 40 (N= 36)		
	%	No	%	No	
Perinatal outcome					
Neonatal ICU Admission	4.0	10	6.0	2	**0.001**
Intra Uterine Growth Retardation	0.0	0	0.0	0.0	
Uneventful Outcome	30.0	79	60.0	21	
Neonatal outcome					
Low birth weight (kg)	5.0	13	10.0	4	**0.000**
Macrosomy	8.0	20	8.0	3	
SGA	5.0	13	18.0	6	
LGA	9.0	24	13.0	5	
APGAR score :					
- at < 7 1st min	5.0	13	7.0	2	
- at < 7 5th min	2.0	5	3.0	1	
Congenital anomalies	2.0	5	9.0	3	
Stillbirth	0.0	0	0.0	0	

Table (1) distributes socio-demographic characteristics of the studied mothers. It was observed that mother' age ranged from 35 - 45 years, and that mothers were mostly between 35 < 39 years (88.0%) and (12.0%) of them were ≥ 40 years. Regarding level of education, it was observed that high percentage of mother (31.0%) were in secondary education. As regards occupation, it was noted that more than three quarters of mother (79.0%) were housewives compared to (21.0%) of them were worked.

Concerning the percentage distribution of studied mothers according to their residence, **figure (1)** pointed out that urban residence was more (68.0%) compared to rural residence was (32.0).

Table (2) showed the obstetrical history of mothers, regarding parity, it was observed that 71.0% of mothers were Multi gravida and 20.22% were Grand multi gravid only 8.88% mothers were primigravida. Also, it was noted in mothers that most of them (70.0) didn't have obstetrical history compared to (30.0%) of them had obstetrical history.

Regarding to distribution of studied mothers according to pregnancy outcome, **Figure (2):** revealed that more than half (52.0%) of the mothers delivered vaginally, 39.0% underwent LSCS, 8.0% underwent suction and Evacuation for abortion, Laparotomy were performed in 1.0%.

Regarding to causes of delay in the pregnancy **figure (3),** illustrated that preference for male child (24.0%) and lack of awareness (25.0%) were two major reasons for delaying pregnancy.

The present study **Table (3),** showed percentage distribution of studied mothers according to pregnancy complications and it was noted that, 50.0% mother had uneventful outcome. Other mothers had complication including abortion (8.0%), Ectopic Pregnancy (1.0%), Anemia (6.0%), Gestational diabetes (1.0%), Pregnancy induced Hypertension (5.0%), Eclampsia (4.0%), Preterm Delivery (9.0%), Oligohydramnios (5.0%), Malpresentation (4.0%), Twin Delivery (2.0%), premature rupture of membrane (3.0%), and Antepartum haemorrhage (3.0%) and Postpartum hemorrhage (2%)

Table (4): showed percentage distribution of studied mothers according to perinatal outcome and neonatal outcome and it was observed that, regarding perinatal outcome was uneventful in 90.0% of mothers, 8.0% required NICU admissions and Intra Uterine Growth Retardation were 2.0%. As regard neonatal outcome 15.0% of neonates were low birth weight baby, macrosomy were 12.0%, SGA 23.0%, LGA 22.0%, Apgar score was < 7 at 1st min among 12.0% of babies and < 7 at 5th min in 5.0%, congenital anomaly was seen in 11.0% of babies, there was no stillbirth.

Table (5): showed relation between mother 'age and perinatal outcome and neonatal outcome, it was observed that a statistical significant differences were found between mother 'age and perinatal outcome and neonatal outcome (P= 0.001, p= 0.000) respectively.

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4. DISCUSSION

Delayed childbearing is now become increasingly in the past decades. In the Recent years have seen significant growth in mean of maternal age at the first childbirth **(Sobotka, 2017).** And there are similar trends have been observed worldwide, in both high- and low-income countries **(Shan et al. 2018).**

And other changes in work and society have been reflected in women's desire to develop their careers, also obtain financial security and built a stable relationship with their partner before becoming mothers **(Laopaiboon et al. 2014).**

Higher educational level among women led to a better knowledge and increase awareness of different types of contraception and, together with greater access to birth control methods, constitutes another factor responsible for an increase in maternal age (**Neelam et al., 2018**)

From the current study it was observed that, mother' age ranged from 35 - 45 years, and that mothers were mostly between 35 < 39 years , high percentage of mother were in secondary education and n noted that more than three quarters of mother were housewives.

The present study showed that, most of mothers were Multi gravida and about one twenty percent were Grand multi gravid only less than one percent of mothers were primigravida. This result was in agreement with **(Priyadatt et al., 2016)** who found the same result; this is because of high fertility and large family size trends.

Current study revealed that more than one third of mother were had underwent LSCS, this result was similar with result conducted by **(Khalil et al, 2013)** who found that caesarean section rate was the same. These results were similar to findings conducted by **(Dietl et al, 2015)** who reported that advanced maternal age predisposes to caesarean delivery and indicated that C-section rate was higher in the study group.

Similar result has been presented in another study by **(Pawde, et al., 2015)** and in accordance with results about " Pregnancy in women aged 35 years and above: A prospective observational study " conducted by **(Bayrampour and Heaman, 2010)** who found that advanced maternal age is known as risk factor for delivery via cesarean section. This is may be related to that there is a persistent negative relationship between the age of pregnant women and the function of the uterus **(Main, et al., 2012).**

Also results were consistently with **(Bayrampur and Heaman, 2010)** who showed that women above 35 year of age are more likely than younger women to be delivered by caesarean and there is almost linear increase in relationship between maternal age and uterine dysfunction in a continuous effect throughout the child bearing years as reported by **(Main et al, 2012).**

The present study revealed that, causes of delay in the pregnancy were preference for male child and lack of awareness. This result was similar with the study conducted by **(Giri et al, 2012)** who showed that desire for male child was the cause and unawareness.

The present study showed that pregnancy complications were including abortion , Ectopic Pregnancy , Anemia , Gestational diabetes , Pregnancy induced Hypertension , Eclampsia , Preterm Delivery , Oligohydramnios , Malpresentation , Twin Delivery , premature rupture of membrane , antepartum haemorrhage and Postpartum hemorrhage.

These results were in accordance with **(Ramchandran et al., 2015)** who studies "Obstetric and perinatal outcome of elderly mothers aged 35 years and above" and reported that abortion rate was associated with maternal age because majority of foetal losses occurred in 1st trimester and these could be attributed to aneuploidies. Also anemia, incidence of pregnancy induced hypertension is higher among the elderly pregnant women; this is because of micro vascular endothelial dysfunction which is basic pathology of preclamsia, which is further accelerated with advanced maternal age.

The current study reflected that, there was a relation between hypertension of mothers and women ≥40 years. This result was in congruence with **(Nagarwal et al., 2015)** who found the same relation. Advanced maternal age in pregnancies was associated with increased risk of gestational diabetes, placenta previa, and higher birth weight but a lower rate of NICU admission **(Yeon et al., 2019).**

These results were in consistent with the result conducted by **(Johnston et al., 2003)** about " Demographic and obstetric outcomes of pregnancies conceived by assisted reproductive technology(ART) compared to non-ART pregnancies "who found that rates of gestational diabetes and placenta previa among women increased with advancing maternal age. This could also be explained by progressive vascular endothelial damage with increasing age.

Also consistent with results by **(Zhu et al., 2018)** about " Obstetric outcomes of twin pregnancies at advanced maternal age: a retrospective study " who reported that advanced maternal age in pregnancy was associated with increased gestational diabetes. This result also was in agreement with the study conducted by **(Lisonkova et al., 2013)** who studied "Effect of advanced maternal age on perinatal outcomes in twins: the impact of chorionicity" and mentioned that other studies have suggested that some perinatal outcomes, such as a lower risk of neonatal and perinatal death, lower rate of preterm birth, and higher birth weight, were more favorable in pregnancies of advanced maternal age.

The present study reflected that**,** perinatal outcome was uneventful in most of mothers, less than one percent was required NICU admissions and intra uterine growth retardation. As regard neonatal outcome more than one percent of neonates were low birth weight baby, macrosomy, SGA, LGA, Apgar score was < 7 at 1^{st} min among of babies and < 7 at 5^{th} min in less than one percent and congenital anomaly.

The current study revealed that as regard neonatal outcome of neonates were LGA, this result was in agreement with the study conducted by **(Schimmel, et al., 2015)** who studied "The effects of maternal age and parity on maternal and neonatal outcome: Archives of gynecology and obstetrics "and mentioned that the incidence of large for gestational age (LGA) was significantly higher in the women aged ≥ 40.

These results were in accordance with the results conducted by **(Zhang et al., 2002)** about "Multifetal pregnancy in older women and perinatal outcomes" who found the same.

Also the current study displays that, neonatal outcome of neonates were SGA. This result was supported by **(Osmundson et al., 2016)** who studied "Labor outcome at extremely advanced maternal age. American journal of obstetrics and gynecology "and found that, the higher maternal age, the lower gestational age at delivery.

The present study revealed that a statistical significant differences were found between mother 'age and perinatal outcome and neonatal outcome, these results were nearly and supported by **(Kenny et al., 2013)** who found in his study about " Advanced maternal age and adverse pregnancy outcome: evidence from a large contemporary cohort" and reported that advanced maternal age is associated with increased the risk of adverse perinatal and pregnancies outcomes

Also **(Gluck et al., 2018)** who studied "impact of advanced maternal age on the outcome of pregnancies" and found the same result **,** advanced maternal age pregnancies often have decreased uterine blood flow, and the need for a larger placental surface for adequate blood flow during pregnancy may be the reason for increased placenta previa **(Crawford et al., 1997).**

The current study showed that a statistical significant differences were found between mother 'age and perinatal outcome and neonatal outcome. This result was similar with the study conducted by **(Małgorzata et al., 2019)** who studied "Evaluation of Pregnancy Outcomes at Advanced Maternal Age" and found that maternal age has been associated with several adverse pregnancy and perinatal outcomes. And the risk of perinatal complications begins to increase after pregnancy at the age of 35 but becomes significant in women aged ≥ 40.

5. CONCLUSION

It was found that, delayed child-bearing is associated with increasing rate of obstetrical and perinatal complications. There was increasing in pregnancy complications and adverse fetal outcomes among older pregnant women more than 35 years.

6. RECOMMENDATIONS

- Older Women should be encouraged to do prenatal screening and prenatal diagnosis, use of ante partum testing to ensure safe motherhood and a healthy fetus.

- Young mother should be educated about the risks of delayed child bearing at older age that increase the risk of both early and late complications of pregnancy.

- Encourage pregnant women in advanced maternal age they should take care in tertiary referral centers.

- Health Care providers must be aware of the complications and adapt obstetrical supervision for better pregnancy and fetal outcomes

- Study should be applied on large sample in different setting so that the findings can be generalized to large population to establish the association between maternal age and maternal and neonatal outcomes.

- One of the important roles for the midwives and community health nurses providing antenatal care to determine the risk of delayed child birth that pregnant women experience and offer them counseling in these topics.

REFERENCES

[1] **Bayrampour H, Heaman M. (2010):** Advanced maternal age and the risk of caesarean birth: a systematic review. Birth; 37(3):219.

[2] **Bayrampour H., Heaman M. (2010):** Advanced maternal age and the risk of cesarean birth:a systematic review. Birth; 37(3):219–26. https://doi.org/10.1111/j.1523-536X.2010.00409.x PMid: 20887538. [PubMed] [Google Scholar]

[3] **Ben A., et al. (2016):** Pregnancy and Birth Outcomes Among Primiparae at Very Advanced Maternal Age: At What Price? Maternal and child health journal. 20:833–842.

[4] **Ciancimino L., Lagana A., Chiofalo B., Granese R., Grasso R., TriioloO. (2014):** Would it be too late? A retrospective case-control analysis to evaluate maternal-fetal outcomes in advanced maternal age. Archives of gynecology and obstetrics.290 (6):1109-14.

[5] **Crawford BS., Davis J., Harrigill K. (1997):** Uterine artery atherosclerotic disease: histologic features and clinical correlation. Obstet Gynecol; 90:210-5.

[6] **Dietl A., Cupisti S., Beckmann M.W, Schwab M., Zollner U. (2015):** Pregnancy and obstetrical outcomes in women over 40 years of age. Geburtshilfe und Frauenheilkunde; 75(08):827–32. https://doi.org/10.1055/s-0035-1546109 PMid: 26366002 PMCid:PMC4554509. [PMC free article] [PubMed] [Google Scholar]

[7] **Giri R., Srivastav S., Suwal1 A ., and Tuladhar A. (2012):** Advanced maternal age and obstetric outcome Med Coll J.;15(2): 87

[8] **Gluck O., Mizrachi Y., Bar J., Barda G. (2018):** The impact of advanced maternal age on the outcome of twin pregnancies. Arch Gynecol Obstet; 297:891-5.

[9] **Johnson J., Tough S., Wilson R., Audibert F., Blight C., BrockS J., Cartier L., Desilets V., Gagnon A., Langlois S., Murphy L.(2012):** Delayed child-bearing. Journal of obstetrics and gynecology, Canada; 34(1):80-93.

[10] **Johnston R., Fong A., Lovell S., Sobolewski P., Rad S., Turner A. (2015):** Demographic and obstetric outcomes of pregnancies conceived by assisted reproductive technology (ART) compared to non-ART pregnancies. JBRA Assist

[11] **Kalayci H., Ozdemir H., Alkas D., Cok T., Tarim E. (2016):** Is primiparity a risk factor for advanced maternal age pregnancies? The Journal of Maternal-fetal & Neonatal Medicine. 2017; 30(11):1283 https://doi.org/10.1080/14767058.1211633 PMid: 2740

[12] **Kenny L., Lavender T., McNamee R., O'Neill SM. Mills T., Khashan A. (2013):** Advanced maternal age and adverse pregnancy outcome: evidence from a large contemporary cohort. PLoS One;8: e56583.

[13] **Khalil A., Syngelaki A., Maiz N., Zinevich Y., Nicolaides K. (2013):** Maternal age and adverse pregnancy outcome: a cohort study. Ultrasound Obstet Gynecol.; 42(6):634–643. doi: 10.1002/uog.12494. [PubMed] [CrossRef] [Google Scholar]

[14] **Laopaiboon M., Lumbiganon P., Intarut N., Mori R., Ganchimeg T., Vogel J., et al. (2014):** Advanced maternal age and pregnancy outcomes: a multicountry assessment. BJOG.;121(Suppl 1):49–56

[15] **Laxmy R, Beena G. (2013):** Pregnancy outcome in women of advanced maternal age. Int J Bioassay; 2(9):1193-8.

[16] **Lisonkova S., Joseph K., Bell R., Glinianaia S. (2013):** Effect of advanced maternal age on perinatal outcomes in twins: the impact of chorionicity. Ann Epidemiol; 23:428-

[17] **Main D., Main E., Moore II. (2012):** The relationship between maternal age and uterine dysfunction:a continuous effect throughout reproductive life. American journal of obstetrics and gynecology; 182(6):1312–20. https://doi.org/10.1067/mob..106249 PMid:10871444. [PubMed] [Google Scholar]

[18] **Małgorzata R., Beata A.,* Magdalena P., Paulina D., Magdalena N., and Hubert H. (2019):** Evaluation of Pregnancy Outcomes at Advanced Maternal Age**.**

[19] **Nagarwal K., Chandrakanta G., Manohar R. (2015):** Pregnancy outcome comparison in elderly and non-elderly primigravida. Int Multispecialty Journal Health.;1(1):24-30.

[20] **Neelam R., Deepak P., Yogendra S., Verma A. (2018): Effects of advanced maternal age on pregnancy outcome.** International Journal of Reproduction, Contraception, Obstetrics and Gynecology *Rajput N et al. Int J Reprod Contracept Obstet Gynecol. Oct;7(10):xxx-xxx* www.ijrcog

[21] **Ogawa K., Urayama K., Tanigaki S. et al. (2017):** Association between very advanced maternal age and adverse pregnancy outcomes: A cross sectional Japanese study, BMC Pregnancy and Childbirth, 17.

[22] **Osmundson S., Gould JB., Butwick A., Yeaton A., El-Sayed Y. (2016):** Labor outcome at extremely advanced maternal age. American journal of obstetrics and gynecology.; 214(3):362–e1. https://doi.org/10.1016/j.ajog..09.103 PMid: 26454124. [PubMed] [Google Scholar]

[23] **Pawde A., Kulkarni M., Unni J. (2015):** Pregnancy in women aged 35 years and above: A prospective observational study. J Obstet Gynecol India.; 65(2):93-6.

[24] **Priyadatt D., Patel S., Shital T., Mehta, B. Patel A. (2016):** Advanced maternal age; facts, factors and feto maternal outcome. Int J Sci Res.; 5(1):2277-8179.

[25] **Ramachandran N., Sethuraman D., Nachimuthu V., Natrajan T. (2015):** Obstetric and perinatal outcome of elderly mothers aged 35 years and above: a comparative study. Int J Res Med Sci.; 3(1):214-9.

[26] Reprod; 19:16-20.

[27] **Schimmel M., Bromiker R., Hammerman C., Chertman L., Ioscovich A., Granovsky S., Samueloff A., Elstein D. (2015):** The effects of maternal age and parity on maternal and neonatal outcome. Archives of gynecology and obstetrics; 291(4):793–8. https://doi.org/10.1007/s00404-014-3469-0 PMid: 25227657. [PubMed] [Google Scholar]

[28] **Shan D., Qiu PY. Wu Y., Chen Q., Li A., Ramadoss S., et al. (2018):** Pregnancy outcomes in women of advanced maternal age: a retrospective cohort study from China. Sci Rep.; 8:12239.

[29] **Sobotka T. (2017):** Post-transitional fertility: childbearing postponement and the shift to low and unstable fertility levels. Vienna: Vienna Institute of Demography Working Papers 01/; 2017.

[30] **Traisrisilp K. and Tongsong T. (2015):** Pregnancy outcomes of mothers with very advanced maternal age (40 years or more) J Med Assoc Thail.98 (2):117–122.

[31] **Waldenstrom U., Cnattingius S., Vixner L., Norman M. (2017):** Advanced maternal age increases the risk of very preterm birth, irrespective of parity: a population-based register study. BJOG: an international journal of obstetrics and gynecology. 124:1235–1244.

[32] **Wang Y., Tanbo T., Abyholm T., Henriksen T. (2011):** The impact of advanced maternal age and parity on obstetric and perinatal outcomes in singleton gestations. Archives of gynecology and obstetrics.284:31–37.

[33] **Wennberg A., Opdahl S., Bergh C., Aaris K., Gissler M., Romundstad L., Pinborg A., Tiitinen A., Skjærven R., Wennerholm U. (2016):** Effect of maternal age on maternal and neonatal outcomes after assisted reproductive technology. Fertil Steril. 2016; 106(5):1142–1149.e14.

[34] **Wielgos A., Szymusik I., Bartnik P., Kacperczyk J., Kosinska K., Pietrzak B.(2015):** Pregnancy beyond the age of 40-the influence of parity on perinatal outcome. Neuroendocrinology Letters; 36(4):101-7.

[35] **Yeon L., Mi K., Yoo K., Ji-Hee S., Suk-Joo C., Soo-young O., Cheong-Rae R., Jong-Hwa K. (2019):** Perinatal outcome of twin pregnancies according to maternal age

[36] **Zhang J., Meikle S., Grainger D., Trumble A. (2002):** Multifetal pregnancy in older women and perinatal outcomes. Fertil Steril; 78:562-8.

[37] **Zhu C., Wang M., Niu G., Yang J., Wang Z. (2018):** Obstetric outcomes of twin pregnancies at advanced maternal age: a retrospective study. Taiwan J Obstet Gynecol