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Original Research Article

Advanced maternal age and obstetric outcome

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ABSTRACT

Background: The objective of this study was to compare the adverse obstetric and perinatal outcome of pregnancies in women with advanced maternal age > 35 years with that of younger women in age group 20-34 years.
Methods: A retrospective comparative study was carried out in department of obstetrics and gynecology at Adesh Medical College over the period of one year from June 2017 to June 2018. The obstetric and perinatal outcome of 100 women with advanced maternal age (study group) was compared with those of 100 younger women aged 20-34 years (control group).
Results: Among antenatal complications, women of advanced maternal age had increased incidence of hypertensive disorder of pregnancy (26.6% versus 4.4%; p = 0.00009) and breech presentation (8.8% versus 1.1%; p = 0.04). The rate of caesarean delivery was significantly higher in advanced maternal age (28.8% versus 17.7%; p = 0.05). In perinatal outcome, older women had significantly higher incidence of perinatal death (7.7% versus 0%; p = 0.01).
Conclusions: Thus, from this study, it can be concluded that advanced age women had higher incidence of hypertensive disorder of pregnancies and mal presentation, were more likely to deliver by caesarean section and had increased incidence of perinatal death.

Keywords: Advanced maternal age, Obstetric outcome, Perinatal outcome

INTRODUCTION

Advanced maternal age is commonly considered as age of mother as 35 years or more at the time of delivery and very advanced maternal age is defined as older than 40 or 45 years. Pregnancy at advanced maternal age has become increasingly common in last two to three decades. In the developed world, the changing pattern of becoming pregnant at an advanced age can be attributed to various reasons. The reason could be changes in the structure of family with more late marriages or remarriages, women's pursuit of higher education, carrier advancement and advances in assisted reproductive technique and availability of effective and safe contraceptives.[1,2] But in developing countries, the scenario is different. The women tend to become pregnant at advanced age due to concept of large family size, sometimes desire for male child and moreover due to lack of knowledge of availability of effective contraception. Accordingly concerns about adverse effects of advanced maternal age on perinatal outcomes have also increased steadily over past years. While some researchers noted an increased rate of adverse pregnancy outcomes in advanced maternal age, others have failed to find any association between these. The advanced maternal age beyond 35 years is considered to have more adverse pregnancy outcomes as compared to those in younger women.[3] So for the management of pregnant women with age >35 years, it requires an understanding of the effect of age, pre-existing co-morbidities like hypertension or diabetes which may lead to complication during pregnancy, delivery and thus prevent a healthy

outcome.[4] Any pregnancy at or more than 35 years of age are always at increased risk for antenatal complications like preeclampsia, ante-partum hemorrhage, gestational diabetes, preterm birth, intrauterine growth restriction and increased rate of caesarean section. The perinatal morbidity like low birth weight and birth asphyxia as well as perinatal mortality are increased in these women as compared to their younger counterparts.[5] It may be due to placental ageing, dysfunction and insufficiency.

Most of the studies done on obstetric outcome in women with advanced maternal age are from western world and very few studies are performed in our part of world. Thus, the aim of this study was to evaluate the effect of advanced maternal age on obstetric and perinatal outcome in setting.

METHODS

This is a retrospective comparative study carried out in department of obstetrics and gynecology at Adesh Medical College over the period of one year from June 2017 to June 2018. The obstetric and perinatal outcome of 100 women with advanced maternal age (study group) was compared with those of 100 younger women aged 20-34 years (control group). All women included under study had singleton pregnancy and gave birth at > 28 weeks of gestation. Maternal age considered was age at the time of delivery. This is a retrospective study based on the labour records of women. We compared their maternal and perinatal outcomes with those of women 20-34 years of age. Demographic data were collected for maternal age, education, occupation and previous infertility problems. The major maternal parameters studied were age at the time of delivery, parity, gestational age, obstetric complications like ante partum hemorrhage, hypertension in pregnancy, diabetes in pregnancy, preterm labour, PROM and PPH, medical disorders, presentation of foetus and mode of delivery. Foetal parameters studied were foetal weight, congenital anomalies, Apgar score at birth, still birth, preterm baby and intrauterine growth restrictions.

Ante partum hemorrhage (APH) was defined as any vaginal bleeding after 28 weeks of gestation and before delivery of baby. Pre-labour rupture of membrane (PROM) was rupture of membrane before onset of labour. Women who were diagnosed as having pre-existing hypertension were categorized as chronic hypertension. Whereas those who had new onset hypertension after 20 weeks of gestation with or without proteinuria were labelled as preeclampsia and pregnancy induced hypertension respectively. Eclampsia was convulsion occurring in women with hypertension. All these types of hypertension were collectively categorized as hypertensive disorder of pregnancy. Women were classified as diabetic if they had a history of pre-existing diabetes or that diagnosed first time during pregnancy (GDM). Pregnancy termination before 37 completed weeks of gestation was termed preterm delivery. Mode of delivery was categorized as normal vaginal, operative vaginal delivery or caesarean section. Perinatal death consisted of foetal death and early neonatal death in this study. Neonatal death was defined as death of neonate during the first 7 days of life. Birth weight lower than 2500 gm was defined as low birth weight (LBW). Birth weight more than 2 standard deviation below the mean birth weight for gestational age considered as small for gestational age (SGA).[14] Post The chi-square test was used to find any association between categorical variables. p values less than 0.05 was considered significant.

Dependent variables of pregnancy and neonatal outcomes included; Ante partum hemorrhage, postpartum hemorrhage, preterm labour (less than 37 weeks), low birth weight (less than 2500 gm), small for gestational age neonates (birth weight less than or equal to the 10th percentile), type of delivery (normal vaginal delivery or cesarean), Apgar score at 1 min less than 7, NICU admission, malposition, and foetal distress. The significance level was set at p <0.05.

Inclusion criteria

- All women with singleton pregnancy
- Women with >28wk of gestation.

Exclusion criteria

- Women with < 28 weeks of gestation
- Significant malformations of fetus
- Maternal pre-existing illness
- Smoking mothers.

RESULTS

Table 1: Demographic data.

	Study group (n = 100)	Control group (n = 100)	p value
Mean maternal age	36.9 years	24.8 years	< 0.001
Education	39%	29%	0.04
Occupation	6.8%	1.7%	< 0.001
Parity	3.2	2.1	< 0.001

Total 100 women aged 35 years and older and 100 women aged 20-34 years as control were included in this study. The overall prevalence of pregnancy in advanced maternal age was 4.53%. The mean age was 36.9 years in study group. In the control group mean maternal age was 24.8 years. The percentage of educated women is 39% versus 29% in younger age group. 1.7% of women aged 18-34 years had occupation compared to 6.8% of older age group with a significant difference. There was a statistically significant difference between the groups according to parity. The average parity was 3.2 in study group as compared to 2.1 in control group (Table 1).

Table 2: Antenatal complications.

Antenatal complications	Study group	Control group	p value
Hypertensive disorder of pregnancy	24%	6%	< 0.001
Antepartum hemorrhage	6.5%	1.1%	0.04
Pre-labor rupture of membrane	7.8%	1.4%	0.04
Multiple pregnancy	4%	2%	NS
Malpresentation	16%	12%	NS
Gestational diabetes	5.1%	0.7%	0.04

Table 3: Reasons of advanced maternal age.

Reasons for advanced maternal age	n = 100
Desire for male child	23%
Lack of knowledge of contraception	13%
Late marriage	14%
H/O subfertility	11%
Failure of contraception	9%
Bad obstetric history	7%
Remarriage	7%
Concept of large family	6.5%
Death of previous child	5.5%
Ambitious of career	2%

Table 4: Mode of delivery.

Type of delivery	Study group n = 100	Control group n = 100	p value
Normal delivery	44.1%	62%	0.05
LSCS	42%	29%	0.04
Instrumental delivery	3.8%	8.9%	NS

Table 5: Fetal and perinatal outcome.

Variables	Study group n = 100	Control group n = 100	p value
Low birth weight	11.2%	4.5%	0.05
Perinatal death	8.4%	2.4%	0.04
Still birth	1.4%	0.5%	NS
Neonatal death	1.2%	1%	NS
Apgar score <7 at 5 mins of life	7%	7.9%	NS

Among antenatal complications only pregnancy induced hypertension was significantly higher in study group (24% versus 6%). In medical complications diabetes was significantly higher in AMA (4.1% versus 0.7%). Pre-labor rupture of membranes and antepartum haemorrhage are also more common in elderly pregnant females (Table 2). Among major reasons of advanced maternal age in our area was desire of male child, lack of contraception knowledge, failure of contraception, late marriage and now a day's sub-fertility and career ambition are also causing of elderly pregnancy (Table 3). Rate of caesarean delivery was significantly higher in study group (42% versus 29%) (Table 4). The low birth weight was significantly higher in advanced age (11.2% versus 4.5%). Perinatal death was significantly higher in women with advanced age. There was no difference in Apgar score at 5 min of life in two groups (Table 5).

DISCUSSION

In western world, the average age at which first time mothers give birth is continuously rising. From the year 1970-2007, live births among women with advanced maternal age in the US have increased from 5% to approximately 15%.[6,7] The incidence of pregnancy at advanced maternal age was reported as 21% in US by Goldman J et al, 33.4% in Norway by Wang Y et al and as 17.5% from South Africa by Hoque ME.[5,8,9]

According to a multi-country data the prevalence of advanced maternal age varies from 2.8% in Nepal to 31.1% in Japan. The overall prevalence of 29 countries was 12.3%.[10] In our study prevalence was 4.5% below the world average. This trend seen in many countries may be due to women's choice but the scenario in our part of world is different. The incidence of pregnancy at advanced maternal age in this study is only 4.53% which is very less than that mentioned in above studies. This may be due to the fact that women here get married at early age and complete childbearing early. Few women who get pregnant at advanced age do so not by their choice but due to various social reasons where pressure to have male child remains one important cause. Various studies have been carried out globally to identify and assess the complications of pregnancy with increasing maternal age. In this study, the women aged 35 years or more had significantly higher incidence of hypertensive disorder of pregnancy, gestational diabetes, SGA, more cases of operative delivery, abruption etc.

Consistent with the current results, Khalil et al, demonstrated that preeclampsia, SGA, GDM, and CS are more common in advanced maternal age pregnancy.[11] Ihab et al also showed that being >35 years old is associated with high risk pregnancy.[11,12] This is similar to that reported by Amarin et al, Goldman et al, Bobrowski et al and Joseph et al.[8,13-15]

Several studies have shown association between increased feto-maternal adverse outcomes and AMA. Decreased fecundity, high risk of miscarriages, negative impact on in vitro fertilization are affecting the success of conception and pregnancy.

In the ante partum and intrapartum period congenital anomalies, multiple gestation, preeclampsia, gestational diabetes, placental abruption, placenta previa, preterm delivery, low birth weight, macrosomia, malpresentation are important concerns that increase the maternal and perinatal adverse outcomes. In the postpartum period

haemorrhage and depression is thought to be more prevalent among AMA women (Ihab et al, Laopaiboon et al).[10,12]

Duckitt et al, demonstrated that maternal age greater than 40 years doubles the risk of preeclampsia explained by the fact that as pregnancy progresses maternal adaptation (resulting in high flow, low resistance circulation and decrease in mean blood pressure) is impaired in older women leading to development of preeclampsia and chronic hypertension.[16] Hypertensive disorder in pregnancy was significantly higher in study group (24% versus 6%).

In this study, the risk of GDM increased with maternal age. Fulop et al, explained reduction in insulin sensitivity with age by progressive deterioration of beta cell function.[17] Carlon et al, did a population-based study and concluded that odds of GDM were greater in > 40 years age group.[18]

The incidence of breech presentation was significantly higher in advanced age women than younger women. This is similar to that reported by Viegas et al, Gilbert et al, Hoque et al where breech presentation was significantly higher among advanced age women.[9,19,20] But Aghamohammadi et al and Sahu et al did not find any statistically significant difference in malpresentation when aged and young women were compared.[21,22] Several studies have found that advanced maternal age is a risk factor for cesarean delivery.[23] Bayrampour et al, found an increased risk of CS birth in women of advanced maternal age as compared to young females in both primigravida and multigravida.[23] Caesarean delivery rate was significantly more common among advanced aged women as compared to adult women in this study also. The increased operative delivery could be due to age related weakening of myometrium, reduction of oxytocin receptors, increased rates of maternal systemic diseases, and obstetric complications. Some authors identified maternal request as one of the factors subscribing to the increasing cesarean birth rate among primiparous women who had in vitro fertilization pregnancy.[24,25]

Goldman et al, from USA reported that odds of caesarean section among 35-39 years and > 40 years were 1.6 and 2 respectively.[8] Nojomi et al and Verma et al reported the rate of caesarean section to be significantly higher in advanced aged mother.[26,27] In this study, perinatal death (both still birth and neonatal death) was significantly higher in older women than the younger ones.

Odibo et al, identified a positive relationship between advanced maternal age and IUGR may be due to poor oxygen exchange.[28] Low birth weight may be due to age-related changes in the uterine vasculature, poorer placental perfusion. Multiparity, maternal obesity, smoking and maternal pre-existing co-morbidities (pre-gestational hypertension and gestational diabetes) are more common among the elderly pregnant and increases the adverse perinatal outcomes (Ihab et al).[12] This is similar to that reported from USA by Bahtiyar et al and by Bateman and Simpson where the odds of still birth among 35-39 years women were 1.45 and 1.28 respectively.[29,30] Similarly Jocobsson et al also reported increased rate of still birth in aged women.[31] However Nojomi et al Amarin et al and Naheed et al did not find any increase in perinatal mortality rate in women > 35 years when compared to younger women.[4,13,26] Association of low birth weight with advanced maternal age was also found in this study (11.2% versus 4.5%) and although there were no significant difference in Apgar scores in both groups.

There are also some limitations in our article. We designed the study as a retrospective case control study. Prospective studies that include more women can give more information about this growing health concern.

CONCLUSION

This study has shown that pregnancies over 35 years of age are high-risk pregnancies had higher incidence of hypertensive disorder of pregnancies, GDM and malpresentation, are more likely to deliver by caesarean section and have increased incidence of low birth weight and perinatal deaths necessitating more careful antenatal follow-up in which follow-up of pregnancy must be done more carefully. AMA pregnant should be referred to higher centres, including neonatal intensive care.

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REFERENCES

1. Bianco A, Stone J, Lynch L, Lapinski R, Berkowitz G, Berkowitz R. Pregnancy outcome at age 40 and older. Obstet Gynecol. 1996;87:917-22.
2. Berkowitz GS, Skovron ML, Lapinski RH, Berkowitz RL. Delayed childbearing and the outcome of pregnancy. N Engl J Med. 1990;322:659-64.
3. Chloe V, Ruth CF. Pregnancy and advanced maternal age. Progress Obstet Gynecol. 2006;17:113-24.
4. Naheed F, Tufail A, Kammeruddin K, Madiha S. Obstetrical risks with increased maternal age > 35 years. Pakistan J Surg. 2009;25:240-3.
5. Wang Y, Tanbo T, Abyholm T, Henriksen T. The impact of advanced maternal age and parity on obstetric and perinatal outcomes in singleton gestations. Arch Gynecol Obstet. 2011;284:31-7.
6. Matthews TJ, MacDorman MF. Infant mortality statistics from the 2007 period linked birth/infant death data set. Nat'l Vital Stat Rep. 2011;59:1-30.

7. Osterman MJ, Martin JA, Matthews TJ, Hamilton BE. Expanded data from the new birth certificate 2008. Nat'l Vital Stat Rep. 2011;59:1-28.
8. Cleary-Goldman J, Malone FD, Vidaver J. Impact of maternal age on obstetric outcome. Obstet Gynecol. 2005;983-90.
9. Hoque ME. Advanced maternal age and outcomes of pregnancy: a retrospective study from South Africa. Bio Med Res. 2012;23:281-5.
10. Laopaiboon M, Lumbiganon P, Intarut N, Mori R, Ganchimeg T, Vogel JP, et al. WHO multicountry survey on maternal newborn health research network. advanced maternal age and pregnancy outcomes: a multicountry assessment. BJOG: An Int J Obstet Gynaecol. 2014;121:49-56.
11. Khalil A, Syngelaki A, Maiz N, Zinevich Y, Nicolaides KH. Maternal age and adverse pregnancy outcome: a cohort study. Ultrasound Obstet Gynecol. 2013;42(6):634-43.
12. Usta IM, Nassar AH. Advanced Maternal age. Part I: obstetric complication. Am J Perinatol. 2008;25:521-34.
13. Amarin VN, Akasheh HF. Advanced maternal age and pregnancy outcome. East Mediterr Health J. 2001;7:646-51.
14. Bobrowski RA, Bottoms SF. Underappreciated risks of the elderly multipara. Amer J Obstet Gynecol. 1995;172:1764-70.
15. Joseph KS, Allen AC, Dods L, Turner L, Scott H, Listor R. The perinatal effects of delayed childbearing. Int J Obstet Gynecol. 2005;105:1410-2.
16. Duckitt K, Harrington D. Risk factors for preeclampsia at antenatal booking: systematic review of controlled studies. BMJ. 2005:330:565.
17. Fulop T, Larbi A, Douzeicch N. Insulin receptor and ageing. Pathol Biol (Paris). 2003;51:574-80.
18. Carlon MC, Davey MA, Biro M, Kealy M. Very advanced maternal age and morbidity in Victoria, Australia: a population-based study. BMC Preg Childbirth. 2013;13:80.
19. Viegas OA, Leong WP, Ahmed S, Ratnam SS. Obstetrical outcome with increasing maternal age. J Bio Soc Sci. 1994;26(2):261-7.
20. Gilbert WM, Nesbitt TS, Danielsen B. Childbearing beyond age 40: pregnancy outcome in 24,032 cases. Obstet Gynecol. 1999;93:9-14.
21. Aghamohammadi A, Nooritajer M. Maternal age as a risk factor for pregnancy outcomes: maternal, fetal and neonatal complication. African J Pharm Pharmacol. 2011;5:264-9.
22. Sahu TM, Agarwal A, Das V. Advanced maternal age and obstetric outcome. J Obstet Gynecol India. 2007;57:320-3.
23. Bayrampour H, Haeman M. Advanced maternal age and the risk of cesarean birth: a systematic review. Birth Issues Perinatal Care. 2010;37:3.
24. Roberts CL, Algert CS, Carnegie M, Peat B. Operative delivery during labour: Trends and predictive factors. Paediatr Perinat Epidemiol. 2002;16:115-23.
25. Lin HC, Sheen TC, Tang CH, Kao S. Association between maternal age and the likelihood of a cesarean section: A population based multivariate logistic analysis. Acta Obstericia et Gynaecologica Scandinavica. 2004;83:1178-83.
26. Nojomi M, Haghighi L, Bijari B, Rezvani L, Tabatabaee SK. Delayed childbearing and maternal outcomes. Iranian J Reprod Med. 2010;8:80-5.
27. Verma S. Advanced maternal age and obstetric performance. Apollo Med. 2009;6:258-63.
28. Odibo A, McDonald R, Nelson D. Advanced maternal age is an independent risk factor for intrauterine growth restriction (IUGR). Am J Obstet Gynecol. 2004;10:157.
29. Bahtiyar MO, Funai EF, Rosenberg V. Stillbirths at term in women of advanced maternal age in the United States: when could the antenatal testing be initiated? Amer J Perinatol. 2008;25:301-4.
30. Bateman BT, Simpson LL. Higher rate of stillbirth at the extremes of reproductive age: a large nationwide sample of deliveries in the United States. Am J Obstet Gynecol. 2006;194(3):840-5.
31. Jacobsson B, Ladfors L, Milson I. Advanced maternal age and adverse perinatal outcome. Obstet Gynecol. 2004;104(4):727-33.

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