

Pregnancy Outcomes in Women Aged 40 Years and Older

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Abstract

Objective: The aim of this study was to compare the pregnancy outcomes in women aged 40 years and older to that of women 20 to 29 years old after 20 weeks of gestation.

Materials and Methods: In this cross-sectional retrospective study, 153 pregnant women at least 40 years of age consisted the study group while 156 pregnant women aged between 20 and 29 years consisting the control group. The relation between maternal age and pregnancy outcomes was analysed with contingency χ^2 or two-tailed Fisher's exact test with adjusted odds ratios according to age group.

Results: Multiparity and pre-existing chronic medical diseases were observed more frequently in the study group. Older gravidas were more likely to develop gestational diabetes (OR: 15.6, 95% CI: 2.0-120.3) and preeclampsia (OR: 3.9, 95% CI: 1.9-8.0). Older women were also at increased risk for cesarean delivery (OR: 2.3, 95% CI: 1.4-3.7). Rates of delivery before 34 weeks (OR: 4.1, 95% CI: 1.3-12.8) and before 37 weeks (OR: 3.0, 95% CI: 1.2-7.4) were also observed significantly higher in the study group. Low birth weight (<2500 g) was more prevalent in the study group (OR: 11.6, 95% CI: 2.7-50.5). There was not any significant difference between groups in terms of mean birth weight, very low birth weight (<1500 g), intrauterine growth restriction and stillbirth.

Conclusion: Pregnant women aged ≥ 40 years are at increased risk of complications in pregnancy when compared to younger women. More intensive antenatal follow up is necessary for older gravidas.

Keywords: pregnancy outcome, maternal age, parity

Özet

40 Yaş ve Üzerinde Gebelik Sonuçları

Amaç: Bu çalışmanın amacı, 20. gebelik haftasından sonra, 40 yaş ve üstü gebeliklerin obstetrik sonuçları ile 20-29 yaşlar arasındaki gebeliklerin obstetrik sonuçlarını karşılaştırmaktır.

Materyal ve Metot: Bu retrospektif, kesitsel çalışmada en az 40 yaşında olan 153 gebe çalışma grubunu oluştururken, 20-29 yaşlarındaki 156 gebe kadın da kontrol grubu olarak alındı. Maternal yaş ile gebelik sonuçları arasındaki yaş gruplarına göre düzeltilmiş ilişki, ki kare ya da çift-yönlü Fisher'in kesin olasılık testi kullanılarak araştırıldı.

Sonuçlar: Multiparite ve doğum öncesi kronik medikal hastalıklar çalışma grubunda daha sık izlendi. Yaşlı gebelerde gestasyonel diyabet (OO: 15.6, %95 güven aralığı [GA]: 2.0-120.3) ve preeklampsi (OO: 3.9, %95 GA: 1.9-8.0) gelişme riski daha fazlaydı. Yaşlı kadınlarda sezaryen doğum oranı da (OO: 2.3, %95 GA: 1.4-3.7) daha yüksekti. Ayrıca 34 hafta (OO: 4.1, %95 GA: 1.3-12.8) ve 37 haftadan önceki (OO: 3.0, %95 GA: 1.2-7.4) doğumlar da çalışma grubunda daha sık olarak gözlemlendi. Düşük doğum ağırlığı, yaşlı hasta grubunda daha fazlaydı (OO: 11.6, %95 GA: 2.7-50.5). Ortalama doğum ağırlığı, çok düşük doğum ağırlığı (<1500 g), intrauterin gelişme geriliği ve ölü doğum oranları arasında iki grup arasında istatistiksel anlamlı fark bulunmadı.

Tartışma: Kırk yaş ve üzerindeki gebeler, daha genç gebelerle karşılaştırıldığında daha yüksek komplikasyon riski taşımaktadırlar. Yaşlı gebelerde çok daha sıkı antenatal takip ihtiyacı vardır.

Anahtar sözcükler: gebelik sonuçları, anne yaşı, parite

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Introduction

Many women today are delaying childbearing for various reasons. Pursuits of career or financial goals, higher education, delaying of marriage and longer life expectancy have been mentioned as possible reasons for this phenomenon (1,2). Traditionally pregnant women older than 35 years are referred as those with advanced maternal age (3,4) and these women are suggested to have more adverse pregnancy outcomes than the younger pregnant women. Increased incidence of early pregnancy loss, genetic disorders, preterm labor, hypertensive disorders, cesarean delivery and maternal and perinatal mortality has been reported (5-7). Furthermore, adverse fetal outcome has been reported to be largely due to the associated increased incidences of chronic problems and other significant malformations (8).

The number of babies born to women with advanced maternal age has progressively increased over the past decade (9), but the great majority of data on this topic is composed largely of reports of the studies involving pregnant women in their late 30s. However, pregnancies occurring in women aged 40 years or older are increasing in frequency and associated with many confounding factors e.g. parity, preexisting diabetes mellitus or hypertension, which should be taken into account.

Women with maternal age of 40 years and above exhibit significant differences in the incidence of hypertension, diabetes mellitus, antepartum hemorrhage, preterm delivery and cesarean section. The available data suggests that the risks accelerate after the age of 35 years and rapidly increase after the maternal age of 40 years. Nevertheless, there is limited data about the pregnancy outcomes in mothers aged 40 years and older.

The aim of the present study was to test the hypothesis that advanced maternal age of 40 years or above is associated with adverse outcomes for mother and baby.

Materials and Methods

Obstetric records of 153 women aged 40 years or older, delivered at SSK Ankara Maternity and Women's Health Teaching Hospital, between February 2003 and March 2004 were reviewed. The control group included 156 pregnant women aged 20 to 29 years, delivered at the same hospital following each woman from the study group. Data were collected by retrospective review of maternal and neonatal inpatient records.

We compared parity and pre-existing chronic diseases such as diabetes mellitus, hypertension and thyroid dysfunction as confounding factors between the study and the control groups. Pregnancy complications and birth outcomes such as gestational hypertension, gestational diabetes mellitus, preterm delivery, intrauterine growth restriction (IUGR), placenta previa, abruptio placenta as well as mode of delivery, mean birth weight and Apgar scores were compared between two age groups.

Statistical analysis was performed by using SPSS 11.0 for Windows (SPSS Inc, Chicago, IL, USA) statistical software. Statistical analysis included contingency χ^2 or two-tailed Fisher's exact test with adjusted odds ratios (OR) according to the age group. A p value less than or equal to 0.05 was considered as statistically significant.

Results

Data from 309 pregnancies were studied. There were 153 patients in the study population aged 40 years or older (7 nulliparas, 146 multiparas) and the control population (aged 20-29 years) was composed of 156 women (73 nulliparas, 83 multiparas). Table 1 shows the demographic characteristics of the study population. While multiparity was significantly more common in the study group, nulliparity was encountered more frequently in the control group (Table 1). Among 153 women in the study group reviewed, 84 women (54.9%) were 40 years old and 69 (45.1%) were older than 40 years. Figure 1 shows the age distribution of the study population of all patients aged 40 years or older. The majority of patients aged 40 years or older at the time of delivery were in their early 40s.

Table 2 displays various pregnancy complications for both groups. Preeclampsia (OR: 3.9, 95% CI: 1.9-8.0) and gestational diabetes mellitus (OR: 15.6, 95% CI: 2.0-120.3) were observed more frequently in the study group compared to the controls. Furthermore, we observed significantly higher rates of cesarean delivery in women with advanced maternal age compared to the control group (43.0% vs. 25.0%, OR: 2.3, 95% CI: 1.4-3.7). Previous cesarean delivery was the most common indication for cesarean delivery in the study (n=27, 40.9%) and in the control group (n=7, 17.9%).

Neonatal outcomes were presented in Table 3. Preterm delivery rate before 37 and 34 weeks of gestation was significantly higher in the study group (OR: 3.0, 95% CI: 1.2-7.4 vs. OR: 4.1, 95% CI: 1.3-12.8 respectively). We observed significantly higher number of low birth weight newborns (<2500 g) in the study group with advanced maternal age compared to the control group. However, mean Apgar scores, the mean birth weight of the infants (3050 g vs. 3090 g in the study and the control group respectively), the number of very low birth

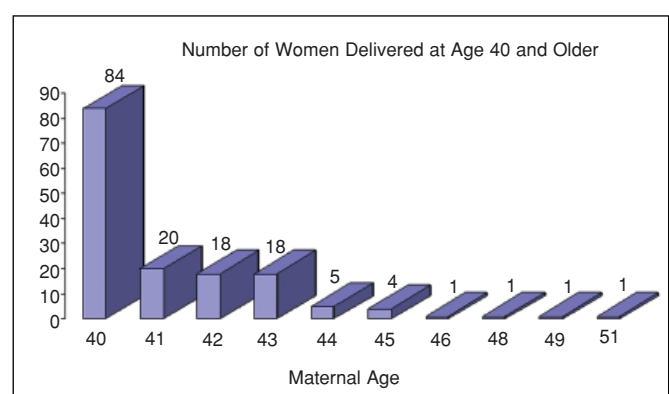


Figure 1. Age distribution of mothers in the study group.

Tablo 1. Demographic characteristics of the study population

	Study Group (n=153)*	Control Group (n=156)*	Statistical Significance (P)
Gravida			
1	6 (3.9%)	68 (43.6%)	<0.0001
2-4	88 (57.5%)	85 (54.5%)	0.6469†
≥5	59 (38.6%)	3 (1.9%)	<0.0001
Parity			
1	7 (4.6%)	73 (46.8%)	<0.0001
2-4	136 (88.9%)	83 (53.2%)	<0.0001
≥5	10 (6.5%)	0	0.08†
Pre-existing chronic disease			
Chronic hypertension	5 (3.3%)	1 (0.6%)	0.0099
Diabetes mellitus	3 (2%)		
Thyroid dysfunction	1 (0.7%)		

*Presented as number and percentage.
†Not specific.

Tablo 2. Antenatal characteristics and pregnancy complications

	Study Group (n=153)*	Control Group (n=156)*	Statistical significance (P)
Pre-eclampsia	35 (22.8%)	11 (7.0%)	<0.0001
Gestational diabetes	14 (9.1%)	1 (0.6%)	<0.001
Abruption	2 (1.3%)	1 (0.6%)	0.62†
Placenta previa	2 (1.3%)	0	0.24†
Anemia	17 (11.0%)	20 (12.8%)	0.72†
Cesarean delivery	66 (43.1%)	39 (25.0%)	<0.001

*Presented as number and percent.
†Not specific.

Tablo 3. Neonatal outcome of the study population

	Study Group (n=153)*	Control Group (n=156)*	Statistical significance (P)
Delivery before 37 weeks of gestation	19 (12.7%)	7 (4.5%)	0.01
Delivery before 34 weeks of gestation	15 (9.8%)	4 (2.6%)	0.0089
Birth weight			
<2500g	20 (13.0%)	2 (1.3%)	<0.0001
<1500g	2 (1.3%)	2 (1.3%)	1
>4000g	9 (5.9%)	8 (5.1%)	0.8
Apgar score <7	10 (6.5%)	6 (3.8%)	0.3155
IUGR	9 (5.9%)	4 (2.6%)	0.166

weight infants (<1500 g) and rate of intrauterine growth restriction were not statistically different between the two groups.

Hydrocephaly was diagnosed in one pregnancy in the study group at 26th weeks of gestation and the pregnancy was terminated. Besides, one patient in the study group, who lacks of antenatal follow-up during her entire pregnancy, delivered an infant with Down's syndrome. There were three (2.0%) stillbirths in the study group diagnosed during the late second trimester in which the patients were preeclamptic and did not receive any medical assistance during their pregnancies.

Discussion

Pregnant women older than 40 years of age are suggested to have more adverse pregnancy outcomes than the younger pregnant women (10,11). It is now unclear that whether advanced maternal age alone is an independent risk factor for adverse pregnancy outcomes or associated risk factors such as hypertension and diabetes mellitus that are seen more frequently in the older gravida, account for increased incidences of pregnancy complications. Previous studies suggest that when underlying maternal disease conditions are taken into account, women in this age are at minimal risk for maternal morbidity and, in fact, overall neonatal outcomes do not appear to be affected significantly (4,12-14). This study confirms that advanced maternal age is a risk factor for certain adverse outcomes in pregnancy; however, associated risk factors that are related to age have to be taken into account.

In the present study, the majority of women in the study group were multiparous and multiparous patients have many unique problems that often unrelated to problems of nulliparous women. As in our study, previous reports concerning the course of pregnancies in older women have focused largely on elderly multiparas. However, today more women are delaying childbearing until the fourth decade of life and the number of first-time mothers are increasing in the modern world. Nulliparous women on their early 40s are often well-educated professionals who purposely have delayed childbearing or frequently have a long history of infertility and become pregnant with the aid of assisted reproductive technology (10). Our institution is a tertiary referral center, which provides medical service mostly to a low socioeconomic group; so many of our patients especially those with advanced maternal age have educational and financial problems that could effect the pregnancy outcomes. Besides, we have experienced more unplanned pregnancies in the older age group.

The age distribution of mothers in our study population showed that the majority of patients were in their early 40s and this finding was consistent with previous reports (10). This is probably due to decreased fecundity with advanced age.

Dulitzki et al. (15) showed the older primiparas to be a high risk population, whereas the multiparas had no excess risk of

adverse outcomes. But this finding could not be reproduced in our study. We found that pregnancy complications in the older age group were significantly higher than controls and it was consistent with the previous reports of Lehman et al. (16) and Göl et al. (17) who showed increased incidence of complications due to diabetes mellitus and hypertensive disorders of pregnancy among older women. We have found that gestational hypertension was increased more than three-fold and gestational diabetes mellitus was increased fourteen-fold in the older age group, compared to controls.

The cesarean delivery rate of 40.9% for the study population aged 40 years or older is more than twice the rate for the control group. This higher rate could be explained only partially by presence of gestational complications. Couples' demands for perfect pregnancy outcomes may cause providers to deliver the infants earlier or by cesarean section because of anxiety concerning stillbirth (12-15,18). Our data reveals that the most common indication for cesarean delivery was previous cesarean deliveries and this could be attributed to higher incidence of multiparous patients in the older age group.

In our study neonatal outcome was favorable in the older women in accordance with most recent studies (4,15,19). Older women were more likely to deliver preterm and more likely to deliver at <34th weeks of gestation (20). We found that the mean birth weights of infants were exactly the same for the two age groups. However, incidence of low birth weight infants was significantly higher in the older age group. Furthermore, preterm delivery rate, both before 37 and 34 weeks of gestation, was also higher in the study population aged 40 years or older. This finding is consistent with most previous reports (11,15-18). We suggest that, prematurity, rather than fetal growth restriction appears to be responsible for the high incidence of birth weights under 2500 g in the older gravidas.

The risk of stillbirth was significantly higher in the older women. Impaired placental function has already been discussed as a possible cause for increased incidence of small for gestational age babies in the older women and may have also contributed to the increased rate of stillbirth (9). In this study, there were three stillbirths in the older age group, of which the mothers were known preeclamptic.

The risk of aneuploidy and fetal congenital anomalies increase with maternal age despite antenatal screening (9). In our study, one of the patients delivered a baby with Down's syndrome and the rate of Down's syndrome was not different from that reported for the general population (21).

In conclusion, the results of this study showed that pregnant women aged ≥ 40 years are at increased risk of complications in pregnancy compared with younger women. However, age alone is not an independent factor for the adverse outcomes. When defining the risks, confounding factors such as multiparity, low socioeconomic status, maternal pre-existing chronic diseases and the quality as well as the sufficiency of antenatal and neonatal health care should be taken into account. Additional work is needed for improving our management protocols in the area of pregnancies with advanced maternal age.

References

1. Bobrowski RA, Bottoms SF. Underappreciated risks of the elderly multipara. *Am J Obstet Gynecol* 1995;172:1764-70.
2. Hansen JP. Older maternal age and pregnancy outcome: a review of the literature. *Obstet Gynecol Surv* 1986;41:726-42.
3. Kirz DS, Dorchester W, Freeman, RK. Advanced maternal age: the mature gravida. *Am J Obstet Gynecol* 1985;152:7-12.
4. Bianco A, Stone J, Lynch L, Lapinsky R, Berkowitz RL. Pregnancy outcome at age 40 and older. *Obstet Gynecol* 1996;87:917-22.
5. Aldous M, Edmonson M. Maternal age at first childbirth and risk of low birth weight and preterm delivery in Washington State. *JAMA* 1993;270:2574-7.
6. Peipert JF, Bracken MB. Maternal age: an independent risk factor for cesarean delivery. *Obstet Gynecol* 1993;81:200-5.
7. Spellacy WN, Miller SJ, Winegar AA. Pregnancy after 40 years of age. *Obstet Gynecol* 1986;68:52-4.
8. Hook EB. Rates of chromosomal abnormalities at different maternal ages. *Obstet Gynecol* 1981;58:282-5.
9. Jolly M, Sebire N, Harris J, Robinson S, Regan L. The risks associated with pregnancy in women aged 35 years or older. *Hum Reprod* 2000;15:2433-7.
10. Gilbert WM, Nesbitt TS, Danielsen B. Childbearing beyond age 40: Pregnancy outcome in 24,032 cases. *Obstet Gynecol* 1999;93:9-14.
11. Jacobsson B, Ladfors L, Milsom I. Advanced maternal age and adverse perinatal outcome. *Obstet Gynecol* 2004;104:727-33.
12. Edge VL, Laros RK. Pregnancy outcome in nulliparous women aged 35 or older. *Am J Obstet Gynecol* 1993;168:1881-5.
13. Cnattingius S, Forman M, Berende SH, Isotalo L. Delayed childbearing and risk of adverse perinatal outcome. A population based study. *JAMA* 1992;268:886-90.
14. Prysak M, Lorenz RP, Kisly A. Pregnancy outcome in nulliparous women 35 years and older. *Obstet Gynecol* 1995;85:65-70.
15. Dulitzki M, Soriano D, Schiff E, Chetrit A. Effect of very advanced maternal age on pregnancy outcome and rate of cesarean delivery. *Obstet Gynecol* 1998;92:935-9.
16. Lehmann DK, Chism J. Pregnancy outcome in medically complicated and uncomplicated patients aged 40 years or older. *Am J Obstet Gynecol* 1987;157:738-42.
17. Göl M, Aydın Ç, Güven CM, Yensel U, Karıcı L, Baloğlu A. 40 yaş ve üzeri kadınlarda gebelik sonuçları. *MN-Gynecology Obstetrics & Reproductive Medicine* 2003;9:176-9.
18. Dildy GA, Jackson M, Fowers GK, Oshiro BT, Varner MW, Clark SL. Very advanced maternal age: Pregnancy after 45. *Am J Obstet Gynecol* 1996;175:668-74.
19. Dollberg S, Seidman DS, Armon Y, Stevenson DK, Gale R. Adverse perinatal outcome in the older multipara. *J Perinatol* 1996;16:93-7.
20. Heffner LJ, Sherman CB, Speizer FE, Weiss ST. Clinical and environmental predictors of preterm labor. *Obstet Gynecol* 1993;81:750-7.
21. Laufer N, Simon A, Samueloff A, Yaffe H, Milwidsky A, Gielchinsky Y. Successful spontaneous pregnancies in women older than 45 years. *Fertil Steril* 2004;81:1328-32.