

Pregnancy outcomes in women aged 40 years or older

Shahla Yazdani¹, Zinatosadat Bouzari^{2,*}, Atefeh Yadollahzadeh¹

¹ Infertility and Reproductive Health Research Center, Health Research Institute & Clinical Research Development Unit of Rouhani Hospital, Obstetrics & Gynecology Department, Babol University of Medical Science, Babol Iran

² Cellular and Molecular Biology Research Center, Health Research Institute & Department of Obstetrics and Gynecology, Babol University of Medical Science, Babol, Iran

³ Student Committee Research, Clinical Research Development Unit of Rouhani Hospital, Babol University of Medical Sciences, Babol, Iran

Received: 24 Aug 2015

Accepted: 23 Oct 2015

Abstract

Background: Many women nowadays postpone their first pregnancy to the fourth or fifth decades of their lives, which could emanate from social, economic and educational factors. This study was an attempt to evaluate the pregnancy and neonatal outcomes in women at 40 years of age or above.

Methods: In this retrospective study, we compared the pregnancy outcomes for women over the aged 40 with those of age group under the age of 40 years. The maternal and obstetrical data, from August 2009 to August 2013, were all obtained from hospitals obstetrical documents. The Chi-square test and the T-Test were used to determine the relationship between the qualitative and the quantitative variables.

Results: During the four years, a total number of 160 women, aged 40 or above gave birth, among which 25% was nulliparous. The mean age at delivery for the elderly group was 42.4 ± 2.1 , which can be compared with the mean age of women (26.7 ± 4.7) under the age of 40. The gestational diabetes ($p = 0.0001$), gestational hypertension ($p = 0.022$), and polyhydramnios ($p = 0.010$) occurred more often in women aged 40 or above. It is worth mentioning that the occurrence of anemia in the third trimester in the elderly group was lower than that of the younger group (8.8% vs. 23.1%) ($p = 0.024$). The preeclampsia, preterm labor, low birth weight, oligohydramnios, bleeding, emergency Cesarean section, and urinary tract infection were all similar in the two age groups.

Conclusion: This study showed that the adverse pregnancy outcomes were significantly higher in the women aged 40 years or above when compared with those of younger women. Therefore, there is an urgent need to provide more frequent prenatal care for the elderly women in primary health care centers.

Keywords: Age, Diabetes, Hypertension, Outcome, Pregnancy

Introduction

Many women nowadays postpone their first pregnancy to the fourth or fifth decades of their lives,

which could emanate from social, economic and educational factors. (1). Statistical data show that the birth rate among women between 40 to 44 years of age is increasing and that it reached 9.4 in 1000 cases in 2006 (2). This increased rate could be due to such various reasons as the high level of education,

*Corresponding author: Dr. Zinatossadat Bouzari, Molecular Cellular Biology Research Center, Babol University of Medical Sciences, Babol, Iran
Tel: +98-911-113-1229, Email: z_b412003@yahoo.co

employment, late marriage, re-marriage, birth control and infertility problems (3).

A survey to estimate the risk of neonatal or maternal complications was carried out in the United States. The results indicate that the risk of maternal death in women at the age of 35 or older is 2 to 3 times more than those at the age of 20; this risk can increase even more in women over the age of 40 (4). On the other hand, other studies reported that the risk of neonatal or maternal complications in elderly women makes no difference with the younger group (5, 6).

Furthermore, there are many research studies discussing the impact of age on pregnancy and neonatal outcomes. However, despite all the risk factors, many pregnant women aged 40 or above have been admitted to our hospital in recent years (Ayatollah Rouhani Hospital). There are no planning health care programs and prevention projects regarding maternal complications for elderly pregnant women. It is highly critical to identify the maternal complications, which are associated with elderly pregnant women. Therefore, in the present study, we evaluated the pregnancy and neonatal outcomes in women at 40 years of age or above.

Materials and Methods

A retrospective, descriptive, epidemiological study was In this retrospective study, we selected all women who were at least 40 years of age at the time of delivery from August 2009 to August 2013, who gave birth at Rohani hospital in Babol, Iran. In order to compare the elderly women with the normal group, we randomly selected 160 women with the age group under the age of 40, who delivered in the same place during a period of 4 years. Mothers with a history of chronic hypertension and diabetes mellitus and other

chronic diseases such as lupus, kidney, heart and liver failure were excluded from the study.

The Ethical Committee of Babol University of Medical Sciences approved the study. After getting the consent from the hospital, data regarding the age, parity, gravidity, abortion, number of living children, maternal weight, height and body mass index (BMI), and cigarette smoking, complications of pregnancy (including, anemia in the third trimester (hemoglobin less than 10), urinary tract infection, bleeding, gestational diabetes, gestational hypertension, preeclampsia, preterm labor, oligohydramnios, low birth weight (LBW), polyhydramnios, vaginal bleeding), mode of delivery, the reason of Cesareansection, and neonatal information including jaundice, Apgar score, Neonatal Intensive-Care Unit (NICU) admission were obtained through a standardized data form and were then recorded and coded.

The diagnosis of gestational diabetes was based on the impaired glucose tolerance during pregnancy. Gestational hypertension was defined as the presence of hypertensive disorders after 20 weeks of gestation. Preterm labor was defined as birth occurring between 20 and 37 weeks of pregnancy. Low birth weight was defined as being less than 2500 grams. Polyhydramnios was diagnosed when the amniotic fluid index was more than 24 cm. Also, amniotic fluid index of less than 5 cm was defined as oligohydramnios.

The data were analyzed using SPSS statistical software (version 18). The Chi-square, Fisher's exact, and the T-Test were used to determine the relationship between the qualitative and the quantitative variables. Statistical significance level in all tests was considered 0.05 and the P-value<0.05 represented the significant difference.

Table 1. Demographic characteristics of pregnant women (N = 320)

Mothers characteristics	Women aged ≥ 40 (N=160)	Women aged < 40 (N=160)	P-Value
Age (years)	42.4 \pm 2.1	26.7 \pm 4.7	0.0001
Gravidity	2.8 \pm 1.4	1.8 \pm 1.1	0.001
Parity	1.4 \pm 1.1	0.6 \pm 0.8	0.0001
Abortion	0.4 \pm 2.1	0.2 \pm 0.5	0.0001
Maternal weight (kg)	81.5 \pm 13.8	431 \pm 14.4	0.555
Maternal height (cm))	160.8 \pm 5.6	61.6 \pm 5.2	0.648
Maternal BMI(kg/m ²)	31.5 \pm 4.9	31.2 \pm 5.0	0.206
Smoker n (%)	1 (0.6%)	0 (0.0)	0.317

-All amount are shown as mean \pm SD

Results

Table 1 summarizes the characteristics of the sample included in further logistic regression. Out of the 1,140 women who participated in this study, 4.2% (59/1414) specifically reported that they had been avoiding pregnancy and preferred voluntary childlessness. The mean QoL of married women within 20 to 45 years of age in physical status, mental/emotional state, stress evaluation, life enjoyment, and overall QoL were 19.0 ± 5.3 , 20.0 ± 6.8 , 23.4 ± 7.8 , 32.6 ± 5.3 , and 61.5 ± 10.1 respectively. Among those who attempted conception ($n=1,081$), 168 women experienced difficulty conceiving at some stage in their lives. In this study, we compared the quality of life of women who had experienced infertility with other fertile ones. There was no statistically significant result found in the mean scores of the five domains (physical state, mental/emotional state, stress evaluation, life enjoyment, and overall quality of life) between the fertile and infertile groups (Table 2).

Table 3 describes the results of logistic regression of each WHOQOL domain; five domains showed significant predictors in the model proposed (Table 3). This Physical State Scale had a range of 10-50 (10 items scored from 1 to 5). It showed BMI as a

predictor, indicating that the underweight/ normal domain ($<25 \text{ Kg/m}^2$) represented better scores compared with the overweight one (obese $\geq 25 \text{ Kg/m}^2$). The mental/emotional state domain had a range of 10-50 (10 items scored from 1 to 5). It showed intermediate own occupation domain represented lower chance of higher (worse) score when compared with managerial / professor and routine own occupation one. In addition, experienced infertility had fatter chance of higher (worse) score in this when compared with the other groups. The evaluation scale of the stress status domain had a range of 10-50 (10 items scored from 1 to 5). The WHOQOL stress domain did not show any statistical significance with any of the characteristics of women included. The life enjoyment domain was very useful in focusing on overall score for the life enjoyment by summing the scores for each question. This life enjoyment scale had a range of 11-55 (11 items scored from 1 to 5). It showed that own occupation, partner occupation, and age were regarded as predictors, indicating that intermediate own occupation, manageable/ professor partner occupation, and age ≤ 35 years represented lower chance of higher (better) score when compared with the other groups. The overall score of quality of life scale had a range of 14-98 (14 items scored from 1 to 7). The intermediate

Table 2. Outcome of pregnancy and neonatal in pregnant women ($n= 320$)

	Women aged ≥ 40 N (%)	Women aged < 40 N (%)	P-Value
Anemia in the third trimester	14 (8.8)	37 (23.1)	0.024
Bleeding	8 (5.0)	5 (3.1)	0.396
Urinary tract infection	8 (5.0)	6(3.8)	0.585
Gestational diabetes (GDM)	47 (29.4)	17 (10.6)	0.0001
Gestational hypertension	38 (23.8)	22 (13.8)	0.022
Preeclampsia	12 (7.5)	5 (3.1)	0.081
Low birth weight (LBW)	2 (1.2)	6 (3.8)	0.152
Oligohydramnios	15 (9.4)	11 (6.9)	0.404
Polyhydramnios	9 (5.6)	1 (0.6)	0.010
Preterm labor	6 (3.8)	5 (3.1)	0.759
Hospitalization during pregnancy	46 (28.8)	54 (33.8)	0.335
Intra uterine fetal death (IUFD)	7 (4.3)	0 (0.0)	0.010
APGAR <7 (in 1 minute)	1(6.0%)	8(5.0%)	0.015
Jaundice	1(6.0)	4(2.5)	0.019
NICU admission	26 (16.9)	31 (19.4)	0.567
Cesarean section	128 (80.0)	126 (78.8)	0.782
Repeat Cesarean section	66 (41.2)	57(35.6)	0.301
Emergency Cesarean section	38(23.1)	35(21.9)	0.689

Table 3. Cause of hospitalization during pregnancy in the women (N = 100)

Variables	Women aged \geq 40 years	Under 40 years	P-Value
	N=46 N (%)	N=54 N (%)	
Oligohydramnios	4(2.5)	11(6.9)	0.064
Post date	6(3.8)	7(4.4)	0.777
Polyhydramnios	0 (0.0)	1(0.6)	0.317
Diabetes	7(4.4)	8(5.0)	0.791
Decreased of fetal movements	7(4.4)	6(3.8)	0.777
Hypertension	18(11.2)	12(7.5)	0.250
Other cause	4 (2.5)	9 (5.6)	0.157

own occupation and age \leq 35 years were associated with worse scores in this domain. No experienced infertility was associated with better scores in the overall score.

Discussion

The advanced maternal age is a risk factor in pregnancy (7). Several studies have shown advanced maternal age is associated with the increased prevalence of weight gain, obesity, fibroids, diabetes, chromol anomalies, and perinatasomal morbidity and mortality (8, 9, 10, 11, 12). In our study, the pregnant women age 40 or over had more complications during pregnancy such as gestational diabetes hypertension, gestational hypertension, and IUFD. Our findings are in agreement with the results of two studies in which the gestational diabetes and IUFD were higher in the older group and significant differences were found between the two groups (13),(14) However, in contrast to a research study, the gestational diabetes did not significantly differ between the two groups (15).

In the report by Jahromi and vincent-RohFritschlike, the gestational hypertension was significantly higher in the older group (15-16), but in a study by Favilli, which is contrary to our study, hypertension was similar in the two groups (14).

Keshavarz et al. also found that preeclampsia increases with age (13). The significant difference in our study could be due to the lower number of people involved in our study compared with that of other studies. But in Favilli's study, pre-eclampsia was similar in the two groups (14).

Several studies reported that the Cesarean section rates were reported to be higher in women aged over 40 (14, 16) and (17). In our study, cesarean section was very high (80 %). In contrast to other studies, we did

not find any differences between the two groups in this regard. A possible explanation for the difference between the result of our study and those of other studies may be due to the small sample compared with other studies as well as the willingness of the women and clinician to caesarean section in this area.

For neonatal complications, the Jaundice and NICU admissions showed no significant differences between the 2 groups. This result is not consistent with Laskov;s study, suggesting that women who experience pregnancy at the age of 45 and above undergo more neonatal complications. Due to these potential differences, proper care need to be thoroughly implemented for the elderly women in primary health care centers during pregnancy.

Conclusion

This study showed that the rate of Cesarean section is so high in Babol, Iran. When considering women aged 40 or over, the occurrence of gestational diabetes and hypertension was higher. It seems that elderly age is associated with higher risk of chronic diseases such as diabetes and hypertension. Neonatal outcome in our older women was generally good. Despite the limitations, this study has important implications for future research and programs. The findings of this study may be used as a basis for the development of prenatal care program for elderly women with regard to maternal complications, adverse pregnancy outcome, and prevention. Emphasis should be placed on ways to prevent gestational diabetes and hypertension during pregnancy for the elderly women. Therefore, there is an urgent need to provide more frequent prenatal care for the elderly women in primary health care centers.

Acknowledgements

We sincerely thank the Development Center of Clinical Research of Rouhani hospital in Babol.

Conflict of Interest

The authors declare that they have no competing interests.

References

- Ziadeh S, Yahaya A. Pregnancy outcome at age 40 and older. *Archives of gynecology and obstetrics*. 2001;265(1):30-33.
- Brady E, Hamilton, Arialdi M, Miniño, Joyce A, Martin, Kenneth D, Kochanek, Donna M. Annual summary of vital statistics: 2005. *Pediatrics*. 2007;119(2):345-346.
- Gravena AAF, Sass A, Marcon SS, Pelloso SM. Outcomes in late-age pregnancies. *Revista da Escola de Enfermagem da USP*. 2012;46(1):15-21.
- Berg CJ, Chang J, Callaghan WM, Whitehead SJ. Pregnancy-Related Mortality in the United States, 1991-1997. *Obstetrics & Gynecology*. 2003; 101(2):289-296.
- Forman MR, Meirik O, Berendes HW. Delayed childbearing in Sweden. *Jama*. 1984;252(22):3135-3139.
- Kirz DS, Dorchester W, Freeman RK. Advanced maternal age: the mature gravida. *American journal of obstetrics and gynecology*. 1985;152(1):7-12.
- Jolly M, Sebire N, Harris J, Robinson S, Regan L. The risks associated with pregnancy in women aged 35 years or older. *Human reproduction*. 2000;15(11):2433-2437.
- Cleary-Goldman J, Malone FD, Vidaver J, Ball RH, Nyberg DA, Comstock CH, et al. Impact of maternal age on obstetric outcome. *Obstetrics & Gynecology*. 2005;105(5, Part 1):983-990.
- Robson S, Cameron CA, Roberts CL. Birth outcomes for teenage women in New South Wales, 1998-2003. *Australian and New Zealand journal of obstetrics and gynaecology*. 2006;46(4):305-310.
- Fraser AM, Brockert JE, Ward RH. Association of young maternal age with adverse reproductive outcomes. *New England journal of medicine*. 1995;332(17):1113-1118.
- Lagrew Jr DC, Morgan MA, Nakamoto K, Lagrew N. Advanced maternal age: perinatal outcome when controlling for physician selection. *Journal of perinatology: official journal of the California Perinatal Association*. 1995;16(4):256-260.
- Windridge KC, Berryman JC. Women's experiences of giving birth after 35. *Birth*. 1999;26(1):16-23.
- Keshavarzi F, Rezaei M, Iranfar S, Fakhri T, Nankali A, Imani A. Advanced maternal age relationship with pregnancy complications. *Behbood Journal* 2011; 15(3): 193-199
- Favilli A, Pericoli S, Acanfora MM, Bini V, Di Renzo GC, Gerli S. Pregnancy outcome in women aged 40 years or more. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2012;25(8):1260-1263.
- Jahromi BN, Husseini Z. Pregnancy outcome at maternal age 40 and older. *Taiwanese journal of obstetrics and gynecology*. 2008;47(3):318-321.
- Vincent-Rohfritsch A, Le Ray C, Anselem O, Cabrol D, Goffinet F. [Pregnancy in women aged 43 years or older: maternal and perinatal risks]. *Journal de gynécologie, obstétrique et biologie de la reproduction*. 2012;41(5):468-475.
- Studzinskiz. Pregnancy and delivery in woman over 40 years old. *Wiad Lek*. 2004;57(3-4):140-144.