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Disparities in adverse pregnancy outcomes between advanced maternal age and younger age in Ethiopia: Institution based comparative cross-sectional study

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Women older than 35 years are known to beat "advanced maternal age" and considered to be at risk of adverse pregnancy outcome. Data on adverse birth outcomes and the risk factors are still scarce in developing countries including Ethiopia. The aim of this study was to examine the obstetrical outcomes among primiparous and multiparous women of advanced age (35 and above) when compared to the younger age group (20 to 34) and identify its predictors among women delivering at public health facilities of Shashemene Town, Ethiopia. Institution based comparative cross sectional study were conducted from March to April, 2016. A consecutive sampling technique was employed to select 306 study participants. Data were collected using pretested structured questionnaires through face to face interview and checklist. Data were entered into Epi-data version 3.1 and analyzed using SPSS version 20.0. Logistic regression analyses were used to identify associated factors. A total of 306 mothers were involved in this study with response rate of 100%. Advanced maternal age, antenatal follow up, mode of current delivery and previous caesarian section were factors associated with adverse pregnancy outcome.

Key words: Adverse pregnancy outcome, advanced maternal age, participants.

INTRODUCTION

Globally, women and children are among the most vulnerable in terms of unfavorable influences in the environment including insufficient nutrition, inadequate health care and poor education. In addition, pregnancy brings those factors as high risk for women. Worldwide, it is estimated that more than 50 million women suffer from poor reproductive health and serious pregnancy related complications (Tesfay et al., 2015).

Mothers age 35 and above at estimated date of delivery is known to be old maternal age (Yogev et al., 2010). Older age is risk factor for decreasing fertility and increasing miscarriage. For women who succeed in

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conception at higher age, the risk of complication during pregnancy and delivery is high (Almhfooth et al., 2013). Older pregnant mothers have an increased risk of pregnancy, labour complications and adverse fetal outcome. Medical complications like hypertensive disorders, gestational diabetes and preterm birth and labour related complications like induction of labour, prolonged labour and hemorrhage are the most common ones. This aged group mothers mostly delivered with caesarean section and their children will have a higher risk of congenital anomalies and will face fetal and neonatal mortality (Tromp et al., 2010). Even if the issue is essential and its effect is bad to the mother and fetus, studies on this area lack adequate data. Therefore this study aimed to compare pregnancy outcomes between advanced maternal age and younger age and identify predicting factors among women delivering at public health facilities of Shashemene Town.

MATERIALS AND METHODS

Study setting and study period

Shashemene town is situated in West Arsi Zone in Oromia Regional State, Ethiopia ("CSA-Ethiopia", 2012). The city lies on the trans-African highway 4 of Cairo-Cape town, about 150 miles (240 km) from Addis Ababa. Based on the 2007 population Census, the population size of Shashemene were 102,062 of which 51,477(50.4%) are males and 50,585 (49.6%) are females. According to the Central Statistical Agency of 2005, females 35.2% (16,288.5) were in reproductive age group (15 to 49), the total fertility rate was 4.2. The population expected for 2013 using the census data in 2007, was 129,084, of which 65,091 were men and 63,993 were women.

Study design and population

A comparative cross sectional study was conducted on pregnancy outcomes among women aged 20 to 34 years and 35[+] delivering at public health facilities in Shashemene town. All pregnant mothers who gave birth at public health facilities of Shashemene town, Ethiopia, from March to April, 2016 were taken as source population and selected mothers who gave birth during the study period at public health facilities of Shashemene town, Ethiopia taken as study population. All mothers 20 years and above who gave birth at public health facilities of Shashemene town, Ethiopia during data collection period were included and women who were seriously ill and unable to respond were not included in the study.

Ethical consideration

Ethical clearance was obtained from the Institutional Review Board (IRB) of Jimma University College of Health Sciences to shashemene town health facility authorities. Permission letters were obtained from Shashemene Referral Hospital and Melkaoda Hospital Administration, after the objectives of the study were explained, consent was obtained from head of maternal and child health unit. Written and verbal consent were taken from selected participant to validate willingness to participate in the study before the interview. Privacy and confidentiality were ensured by using coding.

Sampling technique

A comparative cross sectional study was conducted among women aged 20 to 34 years and 35[+] delivering at public health facilities in the town.

Data collection tools

Data were collected using pretested and structured questionnaire and through chart review. Questionnaire contained socio demographic, obstetrics, medical history and other characteristics.

Data analysis and quality control

Collected data were entered into Epi data version 3.1 and exported to SPSS version 20.0 for analysis. After cleaning data for inconsistencies and missing value in SPSS, binary logistic regressions with p value < 0.25 were transferred to multivariable logistic regression. Variables with p value < 0.05 were considered significant variable. Training for data collectors, pretest and supervision were undertaken to control data quality.

RESULTS

Socio demographic characteristics of the respondent

Three hundred and six study participants participated with a response rate of 100%. The mean age of women (20 to 34) was 24.39 (SD ± 3.865). Regarding residence in the age group 20 to 34, 88 (50.3%) were living in urban. Married women between age 20 to 34 was 151. Those mothers who can read and write were 49(32.02) and 31(20.2) in both age group, respectively. Oromo was the dominant ethnicity is the study area with 110 (71.89%) and 102 (66.69%). Majority of participants in both age group were housewives in their occupation 116 (48.7%), 112(79.7%) and their Income ranged from 1801 to 3000 48.3 (31.37%) (Table 1).

Obstetric characteristics of participants

Majority of normal reproductive age group participants are multigravida which accounts for 92(41.3) and 131(58.7) in advance reproductive age group. Moreover, multiparas were 86(41.1%) and 123(58.9%). Those mothers with 1 to 3 antenatal visits were 89(50.9%) and 86(49.1%), respectively. Mothers who took iron/folic acid during antenatal care visit were 98(44.1%) and 124(55.9%). For mothers in both age group, their current mode of delivery of SVD was 112(73.2%) and 106(26.8). Current labour with no complication in advanced age group was 129(84.3%) (Table 2).

Medical related complications of the respondents

Advanced reproductive age group mothers who do not

Table 1. Sociodemographic characteristics of participants in women attending public health facilities of Shashemene Town, Ethiopia, 2016   (N =153).

Variable	Normal reproductive age group (20-34) N (%)	Advanced reproductive age group (35-49) N (%)
Residence		
Rural	65(49.6%)	66(43.1%)
Urban	88(50.3%)	87(56.86%)
Marital status		
Married	151(98.69)	152(99.34)
Others[1]	2(1.31%)	1(0.65%)
Educational status		
Can't read and write	35(22.87)	39(25.49)
Can read and write only	49(32.03)	31(20.26)
Elementary	38(24.8)	47(30.72)
Secondary	14(9.1)	25(16.34)
College and above	17(11.11)	11(7.19)
Ethnicity		
Oromo	110(71.89)	102(66.66)
Amhara	26(16.99)	28(18.3)
Silte	11(7.19)	15(9.8)
Gurage	5(3.28)	9(5.88)
Others [2]	1(0.65)	9(5.88)
Occupation		
Housewife	116(48.7)	122(79.74)
Merchant	17(51.5)	16(10.46)
Others[3]	20(13.07)	15(9.8)
Income		
300-1000	44(28.76)	46(30.06)
1001-1800	43(28.1)	27(17.64)
18001-3000	48(31.37)	48(31.37)
>3000	18(11.76)	32(20.9)

Others[1]- Single, widowed
Others[2]- Wolayita, Hadiya, Tigire, Kambata
Others[3]- farmer, daily labour

report medical illness before pregnancy was 136(88.88). Whereas in both age group from those who reported previous medical illness 22(14.37) and 17(11.11) anemia is commonly mentioned one 17(11.11) and 6(3.92) respectively (Table 3).

Frequency of maternal adverse pregnancy outcomes of the respondent

While comparing the prevalence of adverse maternal pregnancy outcomes among women aged 20 to 34 and 35[+], the risks were high among advanced maternal age (Table 4).

Frequency of fetal adverse pregnancy outcomes of the respondent

Adverse pregnancy outcome at normal reproductive age group was 45(29.41%) and in advanced age group it was 62(40.5%). Adverse fetal outcomes were more at advanced maternal age in comparison with normal reproductive age group except still birth which was the

Table 2. Obstetric characteristics of participants in women attending public health facilities of Shashemene Town, Ethiopia, 2016 (N= 153).

Variable	Normal reproductive age group (20-34) N (%)	Advanced reproductive age group (35-49) N (%)
Gravidity		
Primigravida	61(73.5)	22(26.5)
Multigravida	92(41.3)	131(58.7)
Parity		
Multipara	86(41.1%)	123(58.9)
Primiparous	67(69.1%)	30(30.9)
Number of visit		
1-3	89(50.9)	86(49.1)
>=4	31(38.3)	50(61.7)
Take Iron /folic acid during ANC		
Yes	98(44.1)	124(55.9)
No	55(65.5)	29(34.5)
Mode of current delivery		
SVD	112(73.2)	106(26.8)
Caesarian section	41(46.6)	47(53.4)
Current labor have any problem or complication		
Yes	26(16.99)	24(15.69)
No	127(83)	129(84.3)
Type of complication		
Prolonged labor	13(8.49)	8(5.23)
Mal position or mal presentation	8(5.23)	11(7.19)
Obstructed labor	2(1.31)	4(2.61)
Others	4(2.61)	2(1.31)

[2]Obstructed labour, Failure of VBAC, uterine rupture, Postterm, APH.

same frequency among the two age group (Table 5). In binary multiple logistic regression age, education, ethnicity, occupation, outcome of last delivery, previous caesarian section and antenatal follow up showed association with p value < 0.2, these variables transferred to multivariate logistic regression then age, antenatal follow up, previous caesarian section and mode of current labour showed significant association with p value < 0.05 (Table 6).

DISCUSSION

The study revealed that the prevalence of adverse pregnancy outcomes was 45(29.41%) and 62(40.5%) among mothers aged 20 to 34 and 35[+], respectively. This study showed that adverse pregnancy outcomes were highly prevalent in advanced maternal age when compared to younger age group. The study done in Norway from 2004 to 2007 ruled out that the prevalence of adverse pregnancy outcomes among advanced maternal age was 33.4% (Laopaiboon et al., 2014). Another study conducted in Taiwan found that the prevalence is from 11.4 to 19.1% (Jahromi and Husseini, 2008). A large, population-based cohort study in the UK showed an 18.2% prevalence of adverse pregnancy outcome among maternal ages of 35 years or older (Kenny et al., 2013).

The prevalence of hypertensive disorder of pregnancy in advanced maternal age was higher when compared to their younger counterparts. This study was similar to the study conducted in Nigeria (Liou et al., 2010). This might

Table 3. Medical related complications of women attending public health facilities of Shashemene Town, Ethiopia, 2016. N =153.

Variable	Age	
	Normal reproductive age group (20-34)	Advanced reproductive age group (35-49)
	N (%)	N (%)
Medical illness before pregnancy		
Yes	22(14.37)	17(11.11)
No	131(85.6)	136(88.88)
Type of medical illness		
Anemia	17(11.11)	6(3.92)
Malaria	0(0.0)	3(1.96)
Upper urinary tract infection	4(2.61)	2(1.31)
Chronic hypertension	1(0.65)	2(1.31)
Diabetes mellitus	0(0.0)	4(2.61)
On treatment		
Yes	17(11.11)	13(8.49)
No	136(88.88)	140(91.5)

be due to the reason that old age is one of a risk factor for pregnancy induced hypertensive disorder.

The prevalence of postpartum hemorrhage in advanced maternal age was higher when compared to their younger counter parts. This study was supported by the study done in Israel (Tesfay et al., 2015). Also according to Laopaiboon et al. (2014), the prevalence of caesarian delivery was 6 times higher among advanced maternal age when compared to younger mother. Study done in Nigeria supports this result; advanced age has higher incidence of cesarean delivery than their counterparts (Bako et al., 2013). These two findings can be based on the reason that advanced age women are more likely to be grand multi-para and this may lead them to face postpartum hemorrhage due to uterine atony. Obstructed labour, prolonged labour, mal presentation and related fetal complications which is more common in advanced maternal age may lead them to caesarean section than their counter part.

Adverse fetal outcome like low birth weight, preterm birth, Apgar score 5 min < 7, congenital anomaly, admission to neonatal intensive care unit (NICU) and fetal death are highly related with advanced age group. This result is similar with a study conducted in Turkey which ruled out that advanced maternal age were significantly associated with fetal complication and Apgar score 5 min < 7 (Lamminpää, 2015). Similarly, study conducted in Flemish found that advanced maternal age were associated with very preterm and low birth weight (Delbaere et al., 2007).

Advanced maternal age (35[+]) was 2 times risky of wide range of adverse pregnancy out come when compared to mothers in normal reproductive age group (20 to 34). The result is in line with a case control study conducted in

Iran, which revealed that advanced maternal age of 40 and above were more complicated by maternal and neonatal complication (Khalil et al., 2013). A retrospective study done in Spain supports this result (Jahromi and Husseini, 2008). In this study antenatal care follow up was significantly associated with adverse pregnancy outcome. Studies done in Gondar University Hospital, Northwest Ethiopia rule out that lack of ANC follow up were associated with adverse pregnancy outcome like still birth (Adane et al., 2014).

A prospective study done at University Hospital UZ Brussels proved that lack of antenatal follow up was associated with adverse pregnancy outcome like preterm (Beeckman et al., 2012). Mode of current labour is significantly associated with adverse pregnancy outcome. Most mothers who came to this hospital were referred from health center with complication that leads to caesarian section. Mothers who deliver by caesarian section were more risky to develop adverse pregnancy outcome than those who delivered by spontaneous vaginal delivery. Caesarian section is a major operation which can be associated with significant maternal and fetal, morbidity and mortality. This can be due to the fact that bleeding in caesarian section is higher than vaginal delivery, this can lead mother to risk of death (Arulkumaran, 2016).

Conclusion

In this study, adverse pregnancy outcome is high in advanced maternal age. Postpartum hemorrhage and Hypertensive disorders are mostly observed adverse outcomes in advanced maternal age. Age, antenatal

Table 4. Frequency of maternal adverse pregnancy outcomes of women attending public health facilities of Shashemene Town, Ethiopia, 2016.

Variable	Age	
	Normal reproductive age group (20-34) N (%)	Advanced reproductive age group (35[+]) N (%)
Pregnancy induced hypertension		
Yes	18(46.2)	21(53.8)
No	135(50.6)	132(49.4)
Type of pregnancy induced hypertension		
Gestational Hypertension	9(42.9)	2(57.1)
Preeclampsia	7(50)	7(50)
Eclampsia	2(50)	2(50)
Ante partum hemorrhage		
Yes	19(57.6)	14(42.4)
No	134(49.3)	139(50.7)
Post-partum hemorrhage		
Yes	23(48.9)	24(51.1)
No	130(50.2)	129(49.8)
Instrumental delivery		
Forceps	3(2%)	2(1.3)
Induction		
Yes	150(98)	151(98.7)
No	25(59.5)	17(40.5)
Cesarean section		
Yes	126(48.5)	136(51.5)
No	41(46.6)	47(53.4)
Indication for cesarean section		
Previous cesarean section	12(46.2)	14(53.8)
Fetal distress	20(43.5)	26(56.5)
Others[2]	7(58.3	5(41.7)

[2]Obstructed labour, Failure of VBAC, uterine rupture, Postterm, APH

Table 5. Frequency of fetal adverse pregnancy outcomes among women at public health facilities of Shashemene Town, Ethiopia 2016.

Variable	Age	
	Normal reproductive age group (20-34) N (%)	Advanced reproductive age group (35 and above) N (%)
Neonatal condition		
Live birth	143(93.5)	143(50)
Still birth	10(0)	10(50)

Table 5. Cont'd.

Gestational age		
Term	146(50.7)	142(49.3)
Preterm	5(45.5)	6(54.5)
Post term	2(28.6)	5(71.4)
Current pregnancy condition		
Single	152(50.3)	150(49.7)
Others	1(33.3)	2(66.7)
Twins	0(0)	1(100)
Birth weight (g)		
<1500	1(14.3)	6(85.7)
1500-2500	4 (28.6)	10(71.4)
2500-4000	145(52.5)	131(47.5)
≥4000	3(33.3)	6(66.7)
5 minute APGAR score <7		
Yes	13(27.7)	34(72.3)
No	140(54.1)	119(45.9)
Congenital anomaly		
Yes	7(33.3)	14(66.7)
No	146(51.2)	139(48.8)
Death	2(28.6)	5(77.4)

Table 6. Multivariable logistic regression Analysis of Adverse pregnancy outcome among women age 20-34 and 35[+] delivering at public health facilities of Shashemene Town, Ethiopia 2016.

Predictor		P value	AOR	95% C.I. for EXP(B)	
				Lower	Upper
Age	20-34	0.026	1.00	1.078	3.288
	35[+]		1.883		
Antenatal follow up	Yes	0.004	1.00	1.529	9.960
	No		3.902		
Previous caesarian section	No	0.000	1.00	0.027	0.321
	Yes		0.094		
Mode of current labour	SVD	0.002	1.00	1.581	7.234
	Caesarian section		3.381		

follow up, mode of current delivery and previous caesarian section are risk factors for adverse pregnancy outcome.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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