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PREGNANCY OUTCOME IN THE ELDERLY GRAVIDA IN ADDIS ABABA

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ABSTRACT

Objective: To determine the difference in selected antepartum obstetric problems and pregnancy outcome between women delivering at the age of 35 or above and women delivering at the age of 20-34 in the Ethiopian setting.

Design: A prospective case control study.

Setting: Saint Paul's and Tikur Anbessa Teaching Hospitals, Faculty of Medicine, Department of Obstetrics and Gynaecology, Addis Ababa University, Addis Ababa, Ethiopia.

Subjects: A hundred and seventy four gravidae delivering at the age of 35 or above and 174 gravidae delivering at the age of 20-34 from December 1, 1997 to August 30, 1998 in the above setting fulfilling inclusion criteria were cases and controls respectively.

Main outcome measures: Included current obstetric problems, labour induction, operative delivery, low birthweight, apgar scores, prenatal death, neonatal intensive care admission rates and mean foetal birthweight.

Results: Pregnancy at old age was more likely to be complicated by hypertension ($p < 0.05$, OR=2, 95% CI= 1.04-4). Cases were more likely to undergo induction of labour ($p < 0.0001$, OR= 2.3, 95% CI= 2.7-12) than controls. Although the rates of poor foetal and neonatal outcome indices seem to increase for the older gravidae, the difference was not statistically significant.

Conclusion: Consistent with other studies, hypertension was the most common disorder complicating pregnancy at age 35 and above. Cases were more likely to undergo induction of labour and operative delivery. Larger studies are needed to establish the exact magnitude of these associations and to show any significant difference in antepartum obstetric problems and fetal and neonatal outcome measures.

INTRODUCTION

Delayed child bearing, for different reasons, appears to be well-established(1). Women who find themselves at the upper end of the reproductive age confront a short "window" for childbearing(2). In the previous decades, birth to women aged more than 35 years often were to women of higher parity and lower socio-economy and occurred in less sophisticated prenatal care facilities. This may remain unchanged for women of developing countries where women are less involved in career development and society rates child bearing a virtue.

Various investigators, including data from assisted reproductive technology indicate that a woman's ability to become pregnant declines steadily with age(3,4) where about 34-46% of women aged 35 years and above are unable to become pregnant. There is also an association between age and risk for spontaneous abortion. Its magnitude is unclear due to many confounding factors such as history of previous spontaneous abortion and increased gravidity, which have been found to increase the chance of spontaneous abortions(3,5).

Diabetes mellitus, hypertension and pre-eclampsia increase in frequency with increasing age(1,3). The increase in hypertension and pre-eclampsia is consistent with the

finding that actuarial data have documented the increasing levels of systolic and diastolic blood pressure with increasing age. Although not conclusive, the bulk of literature supports the fact that the prevalence of diabetes mellitus increases with maternal age(6,7) and now some centres administer one hour glucose tolerance test to pregnant women aged 35 years or more to screen for impaired glucose metabolism. Some investigators reported an increased incidence of premature rupture of the membranes for older pregnant women(8). However, in Naeye's series(9), the effect disappeared when recent coitus and low socio-economic status were controlled. There is increasing risk for late pregnancy bleeding with increasing maternal age, especially from abruptio placenta(8,9,10). This is consistent with increased incidence of hypertension and pre-eclampsia in older pregnant women. The incidence of preterm labour is less well addressed or evidence is conflicting(1,9,11,12). There is a consistent finding indicating a rise in caesarean delivery with maternal age(10-14) with rates more pronounced for primiparas than multiparas.

Probably the most crucial issue about older maternal age is whether it is associated with poor pregnancy outcome. The literature seems to support the finding that older women have increased incidence of low birthweight babies(11,14,15,16) and probably macrosomic babies

consistent with the finding of increased rates of hypertension and diabetes. Foetal and neonatal deaths increase with age probably due to chromosomal abnormalities and malformations, pregnancy associated disorders and obstetric complications(9,11,17,18,19).

As the bulk of information on the obstetric performance of the elderly gravidae appears to emerge from the economically well-off countries, this study was conducted to shade light on the subject from the Ethiopian set-up point of view. The main objective of this study was to determine the difference in pregnancy outcome between women aged 35 and above and those aged between 20 and 34 years in two teaching hospitals in Addis Ababa, Ethiopia.

MATERIALS AND METHODS

A prospective case control study was conducted from December 1, 1997 to August 30, 1998 in Tikur Anbessa and Saint Paul's teaching hospitals delivery units, Addis Ababa. All women aged 35 or above constituted the source population among whom 174 women with defined inclusion and exclusion criteria were the study population. Pregnant women aged between 20-34 years satisfying the inclusion and exclusion criteria were controls. The following inclusion criteria were used for both cases and controls. Hospital delivery, singleton pregnancy at 28 or more completed weeks of gestation, complete information and known gestational age. Cases and controls were excluded from the study if they had previous caesarean scar, uterine rupture, bronchial asthma, cardiac disease and multi-foetal gestation.

Operational definitions used included: preterm labour: the onset of labour after 28 and before 37 completed weeks of gestation; delivery of a foetus after 28 completed weeks of gestation with no evidence of life.

Death of the newborn between delivery to 28 completed days. Early neonatal death refers to death with in the first seven days in hospital. Perinatal death: Is stillbirth and early neonatal death during the study period. Hypertension: Blood pressure of 140/90 mm Hg or greater on two occasions at least 4hrs apart left lateral or sitting position, irrespective of past history of hypertension. Premature rupture of the foetal membranes: Rupture of the foetal membranes an hour before the onset of labor (PROM). Antepartum haemorrhage: Vaginal bleeding after 28 completed weeks of gestation up to the delivery of the foetus. Diabetes mellitus: Abnormal glucose metabolism detected during pregnancy or pre-pregnancy period. It is defined as gestational when detected during pregnancy and pre gestational when diagnosed before pregnancy. Sample size was determined by using $\alpha=0.05$, $\beta=0.2$, $P_0=11\%$ (Caesarean section rate for the hospitals) $P_1=22\%$ (caesarean section rate for elderly gravidae from different studies). Following patient informed consent, pre-tested questionnaire was filled out by interns and residents. Data were analysed using Epi-Info 6 statistical package. Outcome measures included selected antepartum complications, intrapartum interventions and perinatal complications. Newborns were followed while in hospital but maternal outcome was not analysed. Odds ratio, χ^2 test with two sided Fisher's exact test and statistical significance when $p < 0.05$ were used where applicable.

RESULTS

During the study period 4139 women delivered in the study hospitals of which 450(11%) were aged 35 years or

more. Out of 174 cases studied, 27 (16%) were primiparous and the remaining multiparous. The general characteristics of the study subjects are shown in Table 1. Although the difference in monthly income was not statistically significant, the controls earned better in the 499-1000 Birr range and the cases in over 1000 Birr range. At all levels of education, the controls were more educated than the cases. More than 80% of cases and controls were booked for antenatal care. Five per cent of controls and 39% of cases were grand multiparas. This difference was statistically significant ($p < 0.001$). There was no statistically significant difference in marital, occupational and booking status between the study groups. Table 2 shows the distribution of study subjects by current obstetric characteristics. Hypertension was the most frequent pregnancy associated disorder. It occurred in 33 (19%) of women aged 35 years or more and 18(10.3%) of women younger than 35 years. Twenty two (12.6%) and 13 (7.5%) of cases and controls respectively developed premature rupture of the membranes. Seventeen (9.8%) and 14 (8%) of pregnancies in cases and controls respectively experienced preterm labour. Antepartum haemorrhage, malpresentation and diabetes mellitus were seen less frequently. Although hypertension was detected in significantly larger number of cases than controls ($p < 0.05$, $OR=2$, 95% CI 1.04-4) differences in the frequencies of PROM, preterm labour, post-term pregnancy, antepartum haemorrhage, malpresentation and diabetes mellitus did not achieve statistical significance.

Table 1

Distribution of study subjects by selected patient characteristics, Saint Paul's and Tikur Anbessa hospitals

	Age <35 (n=174)	Age ≥35 (n=174)	P-value
Unmarried	17 (10%)	17 (10%)	NS*
Occupation			
Housewife	113 (65%)	110 (63%)	NS*
Employed	40 (23%)	45 (26%)	NS*
Not employed	21 (12%)	19 (10%)	NS*
No antenatal care visit	31 (18%)	30 (17%)	NS*
Education			
Illiterate	41 (24%)	68 (39%)	NS*
<12 grade	78 (45%)	62 (36%)	NS*
≥12 grade	55 (32%)	44 (25%)	NS*
Parity			
0 - 4	165 (95%)	107 (61%)	0.0001
≥5	9 (5%)	67 (39%)	
Income in Birr+			
<499	115 (66%)	124 (71%)	
499-1000	53 (31%)	37 (21%)	0.05
>1000	6 (3.4%)	13 (8%)	

* not significant; + 1 USD = 8.4 Birr.

Pregnancy was terminated by induction in 23 (13.2%) of the elderly gravidae and 11 (6.3%) of the young gravidae. Operative delivery was necessary in 71 (41%) of the former and in 52 (21%) of the latter group. The Caesarean section rate was 24% for cases and 5% for controls.

Women aged 35 years or above were more likely to have induction of labour, Caesarean delivery and overall increased rate of operative deliveries (Table 3). The most common indication for abdominal delivery was foetal distress. Out of 42 Caesarean deliveries performed cases, 18 (43%) were for foetal distress, 8 (19%) for cephalopelvic

Table 2

Current selected obstetric problems among study subjects, Saint Paul's and Tikur Anbessa hospitals

	Age <35 (n=174)	Age ≥35 (n=174)	P-value
Hypertension	18 (10.3%)	33 (19%)	0.03
Diabetes mellitus	1 (0.6%)	5 (3%)	NS*
APH	6 (3.4%)	10 (6%)	NS*
Malpresentation	6 (3.4%)	7 (4%)	NS*
PROM	13 (7.5%)	22 (12.6%)	NS*
Preterm labor	16 (8%)	18 (9.8%)	NS*
Post-term pregnancy	14 (8%)	17 (10%)	NS*

*NS: Not significant

Table 3

Selected obstetric interventions by maternal age, Saint Paul's and Tikur Anbessa hospitals

	Age <35 (n=174)	Age ≥35 (n=174)	P-value	OR+	95% CI*
Labor induction	11 (6.3%)	23 (13.2%)	0.03	2.3	(1.06-4.8)
All operative deliveries#	52 (21%)	71 (41%)	0.02	1.6	(1.04-2.5)
Caesarean section	9 (5%)	42 (24%)	0.00001	5.8	(2.7-12.4)

+ Odds ratio; * Confidence interval;

Includes forceps, vacuum and cesarean section.

Table 4

Distribution of selected fetal and neonatal outcomes among study subjects Saint Paul's and Tikur Anbessa hospitals

	Age <35 (n=174)	Age ≥35 (n=174)	P value
Mean birth weight	3030 ± 511	3051 ± 635	non significant
Low birth weight	15 (9%)	20 (13%)	NS*
Weight 4kg	6 (3.5%)	8(5%)	NS*
First minute apgar 6	48 (28%)	60 (35%)	NS*
Fifth minute apgar 6	14 (8%)	25 (14%)	NS*
Perinatal death (corrected)	6 (3.5%)	15 (9%)	NS*
Still birth	7 (4%)	13 (8%)	NS*
ENND•	1 (0.6%)	4 (2%)	NS*
Admission to neonatal intensive care unit	12 (7%)	23 (13%)	NS*

NS: Not significant

• Early neonatal death.

disproportion and five (12%) for antepartum haemorrhage. Nine of the Caesarean sections patients were primiparas (rate of 33%) and the remaining 33 were multiparas (rate of 23%). Parity was not found to influence the rate of Caesarean section significantly ($p < 0.05$). However, most of the Caesarean deliveries performed for foetal distress

and cephalopelvic disproportion were on multiparous women. The majority of the women who underwent Caesarean delivery for foetal distress had no high risk for fetal distress such as hypertension, antepartum haemorrhage or intra-uterine growth retardation.

Table 4 shows selected neonatal outcomes among the study subjects. The mean weight were 3051 and 3030 grams for cases and controls respectively. The difference was not significant. There is no difference in the male to female ratio of the newborns. Twenty (13%) and 15 (9%), 8 (4%) and 6(3%) of the newborns were low birthweight and macrosomic respectively for cases and controls in that order. Low Apgar score in the first and fifth minutes was found in 60 (35%) and 25 (14%) of the newborns of women aged 35 years or above and in 48 (28%) and 14 (8%) of the newborns of women aged below 35 years. Although the number of newborns with low Apgar score, perinatal deaths, intensive care unit admissions and low birth weight babies appear to be higher for cases than controls the difference was not statistically significant. There were a total of five babies born with lethal congenital malformations, three to the older and two to the younger women.

DISCUSSION

This study showed more than 90% of the study subjects were married. More than three fourth of them had antenatal care, because the majority of women were urban dwellers. Among the cases 27 (16%) were expecting their first baby. This is higher than the 9.7% figure reported by Cunningham and Kenneth(20) among 898 women aged 35 years or above at Parkland Memorial Hospital. This suggested women are delaying pregnancy beyond 35 years as in other parts of the world for various reasons. The majority of the cases were parous, a finding similar to that of Cunningham and Kenneth(20).

In this study, pregnancy in the elderly gravida was twice more likely to be complicated by hypertension. Hansen in his review(3) found that 16 of 18 studies reported a positive correlation between age and hypertension and/or toxemia, generally showing a two to four fold increase in frequency for older as compared to younger women. This is consistent with the finding that actuarial data documented the increasing levels of systolic and diastolic blood pressure with increasing age. Diabetes mellitus was identified in three per cent of older women compared to 0.6% in younger women. Different authors have reported rates ranging from 0.6-6%(3), with higher rates in parous women, without adjusting for other risk factors. Hansen(3) in his review of literature found an increased risk of premature delivery for women aged 35 years and above by 10 of 14 studies. Berkowitz *et al*(15) in a study of predominantly whites, married and college educated primiparous private patients found a rate of 12% which is comparable with the 9.8% reported here. Some investigators reported an increased incidence of premature rupture of the membranes for older pregnant women(7) although in Naeye's(9) series, this effect disappeared

when other factors were controlled. Antepartum haemorrhage increases with maternal age, especially from abruptio placenta (5,12,13). The rates of pre-term labour, premature rupture of the membranes, post-term pregnancy, antepartum haemorrhage and malpresentation in the older patients in this study did not show statistical significance compared to rates for younger patients. However, this analysis was based on small number of patients to make further conclusion.

The overall caesarean section rate for pregnant women aged 35 years or above was 24% compared to 5% for those aged below 35 years. The older primiparae had a rate of 33% compared to the 23% rate of the older multiparae. The difference between the two age groups was significant ($p < 0.0001$). Older primiparae had higher Caesarean section rate than older multiparae but the difference was not statistically significant ($p > 0.05$).

Of the gravidae aged 35 years or above who had Caesarean section, nearly half of them underwent the procedure with the diagnosis of foetal distress that is the most common indication for Caesarean delivery in the study hospitals. In few of the cases there was associated hypertension and/or post-term pregnancy, but majority had no associated risk factor for foetal distress. Although different Caesarean section rates have been reported by different authors (10,11,13,14) and difficult to compare figures for various reasons, the overall agreement is that Caesarean section rate increases markedly with increasing maternal age even when contributing factors like induction of labour, epidural anaesthesia, meconium stained liquor and foetal distress are controlled. It has been suggested that increase in Caesarean delivery for older women may be a self-fulfilling prophecy with physician belief that this group is at increased risk for labour complications and Caesarean section would circumvent it (13,21).

Except for a slight increase in the mean birthweight, low birthweight rate, low Apgar score, prenatal death, early neonatal death rate and admission to neonatal intensive care unit for older age group, the foetal and neonatal outcome difference was not significant ($p > 0.05$). This may be partly explained by the small size of the study and similarity between cases and controls (Table 1). The low birthweight rate of 13% for older women is similar to that reported by Cunningham and Kenneth (20).

This study has shown that women aged 35 years and above are more parous and less educated than women under 35. Consistent with other studies, hypertension was the most common medical disorder complicating pregnancy at old maternal age. Pregnant women aged 35 years or above were more likely to undergo induction of labour and operative deliveries. Although the rates of poor foetal and neonatal outcome indices seem to increase for

the older women, the difference was not statistically significant. Larger studies are needed to establish the exact magnitude of these associations and any significant difference in foetal and neonatal outcome measures in developing countries set-up.

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