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Problem of childbirth among women aged 40 years and above in the African context

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Abstract
Introduction: In recent decades, the age at childbearing has continued to increase for multiple reasons. These include the education of girls, delayed marriage, pursuit of professional careers, the desire to conceive after a second union, the availability of assisted reproductive technologies, and the low uptake of family planning methods. Consequently, late pregnancies are associated with increased risks for both the mother and the fetus**.**
Materials and Methods: This was a retrospective analytical case-control study, unmatched, conducted over 11 years from January 1, 2008 to December 31, 2018, in the Department of Gynecology and Obstetrics of CHU Point G, Bamako.
Results: The frequency of childbirth at advanced maternal age (≥ 40 years) was 1.93 %. Married women were the most represented in both cases and controls. Women aged 40 years and above were 1.7 times more likely to develop hypertension compared with women aged 20-34 years. Diabetes was observed in 12.36 % of cases versus 0.04 % of controls. Placenta previa occurred exclusively in cases (7.18%). The risk of anemia was significantly higher among older parturient (OR = 5.95). No significant association was found between advanced maternal age and cesarean delivery (OR = 1.22), maternal death, or a low Apgar score (0-7 at 1 minute, OR = 1.17). Low birth weight (< 2500 g) was observed in 21.88% of younger mothers (20-34 years) and 23.85% of older mothers (≥ 40 years).
Conclusion: Pregnancy at 40 years of age and beyond constitutes a high-risk situation for both mother and child. Maternal risks include hypertension, diabetes, placenta previa, anemia, and an increased likelihood of cesarean section. For the newborn, advanced maternal age is associated with a higher risk of stillbirth, prematurity, and macrosomia.

Keywords: Advanced maternal age, pregnancy, cesarean section, maternal death

Introduction
Since the 1980s, the rate of parturient in their fifth decade has doubled [1]. In the United States, the *National Statistics Report* recorded 101,016 live births among women aged 40-49 years in 2002, representing 2.5% of all births [2]. In Canada, the proportion of live births to mothers aged 40-49 years increased from 0.6% in 1982 to 2.6% in 2002 [3]. this age has been steadily increasing due to several factors, including female education, delayed marriage, pursuit of professional careers, and the desire to conceive following a second union. In developed countries, this trend has been facilitated by the availability of assisted reproductive technologies (ART) [4]. In our context, however, the low uptake of family planning, particularly in traditional settings, contributes to the issue of late pregnancies, as women continue to conceive from puberty until menopause. In 1958, the International Federation of Gynecology and Obstetrics (FIGO) defined late pregnancies as those occurring beyond the age of 35 years. More recently, in France, a pregnancy is considered late from the age of 40 years [5]. The increase in maternal and fetal morbidities has traditionally been a concern [6, 7, 8], and awareness of the challenges of conception, obstetrical complications, and neonatal outcomes should enable optimal counseling of patients. We conducted this study to identify the contributing factors and to assess the prognosis of late pregnancies in our department.

Materials and Methods
This study was conducted in the Department of Gynecology and Obstetrics of the University Hospital Center (CHU) Point G in Bamako, a tertiary-level referral maternity unit that receives cases from both Bamako and across Mali.

We performed a retrospective and prospective analytical case-control study over an 11-year period, from January 1, 2008 to December 31, 2018. The study included all women who delivered in the department with a gestational age ≥ 28 weeks. Cases were defined as women aged 40 years and above at delivery, while controls were women aged 20-34 years, chosen because this age range represents the optimal reproductive period. Data analysis was performed using SPSS version 21. Statistical tests included calculation of odds ratios (OR) with 95% confidence intervals (CI).

Results

During the study period, 17,983 women delivered in our department, of whom 348 were aged 40 years and above, representing a frequency of 1.93 %. Sociodemographic characteristics: Married status predominated, with 99.43% among cases and 97.19% among controls (Table 1). The proportion of women with no antenatal care (ANC) or with only 1-3 visits was significantly higher in cases compared with controls: 9.20 % and 43.97 % versus 5.76 % and 37.15 %, respectively (Table 2). Maternal complications: Women aged ≥ 40 years were 1.7 times more likely to develop hypertension compared with those aged 20-34 years (OR = 1.7; 95% CI [1.25-2.33]). Diabetes was observed in 12.36% of cases compared to 0.04 % of controls. Placenta previa was found exclusively among cases (7.18%). The risk of anemia was 5.95 times higher among cases (OR = 5.95; 95% CI [2.99-11.83]) (Table 3). Obstetric outcomes: No significant association was found between advanced maternal age and cesarean delivery (OR = 1.22; 95 % CI [0.98-1.51]) (Table VII). Maternal death was not significantly associated with advanced age (OR = 1.64; 95% CI [0.22-12.54]) (Table 4). Parity: Primiparous women represented only 6.61% of cases, whereas they accounted for 42.03% of controls. Conversely, grand multiparity predominated among cases (56.9% vs. 5.21% among controls) (Figure 1). Perinatal outcomes: No significant association was found between advanced maternal age and an Apgar score of 0-7 at 1 minute (OR = 1.17; 95% CI [0.92-1.50]) (Table 5). Low birth weight (<2500 g) was observed in 21.88% of neonates born to mothers aged 20-34 years and 23.85% of those born to mothers aged ≥ 40 years (Fig 2).

Table 1: Distribution of cases and controls according to marital status

Marital status	Cases (n=348)	Controls (n=8001)	Total (N=8349)
Married	346 (99.43%)	7776 (97.19%)	8122
Single	2 (0.57%)	218 (2.72%)	220
Widow	0 (0.0%)	7 (0.09%)	7

Table 2: Distribution of parturients according to number of ANC visits and marital status

Number of ANC visits	Cases (n=348)	Controls (n=8001)	Total (N=8349)	OR	95% CI
None	32 (9.20%)	461 (5.76%)	493	1.95	1.32-2.88
1-3 visits	153 (43.97%)	2972 (37.15%)	3125	1.44	1.15-1.81
≥4 visits	163 (46.84%)	4568 (57.09%)	4731	Ref	-
Marital status					
Married	346 (99.43%)	7776 (97.19%)	8122	Married	346 (99.43%)
Single	2 (0.57%)	218 (2.72%)	220	Single	2 (0.57%)
Widow	0 (0.0%)	7 (0.09%)	7	Widow	0 (0.0%)

Table 3: Distribution of parturients according to associated pregnancy pathologies

Associated pathology	Cases (n=348)	Controls (n=8001)	Total (N=8349)	OR	95% CI
None	208 (59.77%)	6802 (85.01%)	7010	Ref	-
Hypertension	53 (15.23%)	1015 (12.69%)	1068	1.71	1.25-2.33
Diabetes	43 (12.36%)	3 (0.04%)	46	-	-
Placenta previa	25 (7.18%)	0 (0.0%)	25	-	-
Heart disease	6 (1.72%)	20 (0.25%)	26	-	-
Urinary infection	3 (0.86%)	106 (1.32%)	109	0.93	0.29-2.94
Anemia	10 (2.87%)	55 (0.69%)	65	5.95	2.99-11.83

Table 4: Distribution of parturients according to mode of delivery

Mode of delivery	Cases (n=348)	Controls (n=8001)	Total (N=8349)	OR	95% CI
Spontaneous vaginal	201 (57.7%)	4989 (62.35%)	5190	Ref	-
Assisted vaginal	3 (0.9%)	74 (0.9%)	77	1.01	0.31-3.21
Cesarean section	144 (41.3%)	2938 (36.72%)	3082	1.22	0.98-1.51

Table 5: Distribution of parturients according to postpartum outcome

Postpartum outcome	Cases (n=348)	Controls (n=8001)	Total (N=8349)	OR	95% CI
Alive	347 (99.71%)	7987 (99.83%)	8334	Ref	-
Deceased	1 (0.29%)	14 (0.17%)	15	1.64	0.22-12.54

Table 6: Distribution of parturients according to Apgar score at 1st minute

Apgar score at 1 min	Cases (n=348)	Controls (n=8001)	Total (N=8349)	OR	95% CI
8-10	256 (73.56%)	6130 (76.61%)	6386	Ref	-
0-7	92 (26.40%)	1871 (23.40%)	1963	1.17	0.92-1.50
Postpartum outcome					
Alive	347 (99.71%)	7987 (99.83%)	8334	Ref	-
Deceased	1 (0.29%)	14 (0.17%)	15	1.64	0.22-12.54

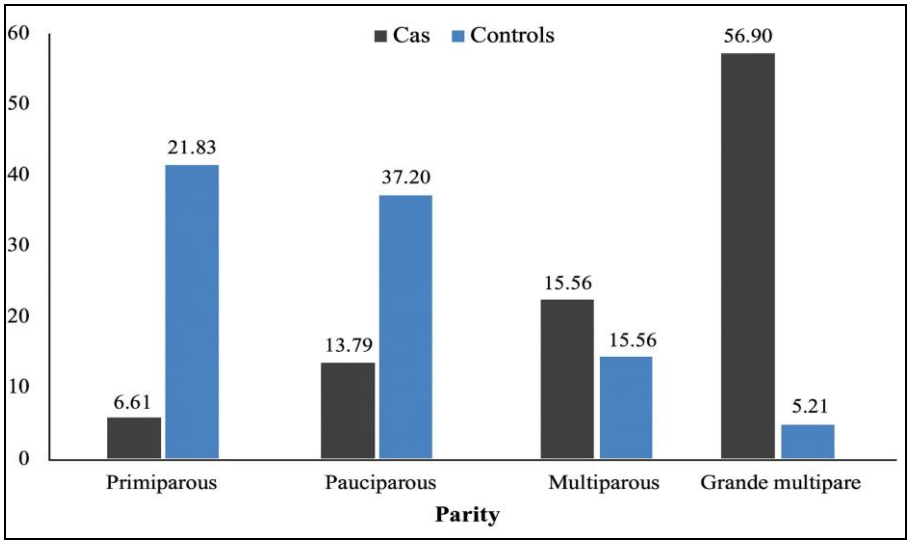

Fig 1: Distribution of parturients according to parity in cases and controls

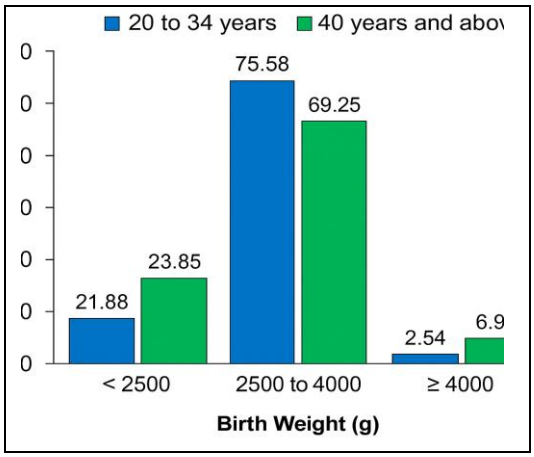

Fig 2: Distribution of parturients according to newborn birth weight

Discussion

In our study, the frequency of deliveries among women aged 40 years and above was 1.93%. Our result is comparable to those reported in France, where the AUDIPOG sentinel network [9] recorded an increase in the rate of births among women aged 40-50 years from 2.4% in 1999 to 2.9% in 2003. Such differences may be related to case definition criteria, as some authors included women aged ≥ 35 years. These rates reflect the natural decline in fertility after the age of 40, likely related to ovulatory disorders at this stage of reproductive life.

Sociodemographic characteristics

Regarding occupation, 80.46% of cases were housewives compared to 63.27% of controls. This predominance has also been noted in other studies [5]. It may be explained by a lower educational level among older women, which increases the likelihood of late pregnancies due to reduced awareness of the risks and limited knowledge of contraceptive methods. In our series, married status predominated among both cases and controls. In our sociocultural context, marriage represents a major milestone in a couple's life and is closely associated with procreation.

Antenatal care

The proportion of women who had no antenatal care (ANC) or only 1-3 visits was significantly higher in cases (9.20 % and 43.97 %) compared to controls (5.76 % and 37.15 %). Our rate is higher than that reported in developed countries. Fetal mortality in utero is generally increased [5, 10, 11, 12], with the risk being doubled. These fetal losses are secondary to maternal and fetal pathologies [13]. Low ANC attendance remains a major determinant of adverse maternal and perinatal outcomes in African settings.

Parity

Grand multiparity was predominant among older women (56.9 % vs. 5.21 %), a statistically significant difference. This finding is consistent with other studies in Mali and reflects the persistence of traditional reproductive patterns in Africa, where women continue to conceive from puberty until menopause. In contrast, in developed countries, late pregnancies are more frequently associated with delayed primiparity.

Maternal complications

The risk of preterm delivery was significantly higher among older women in our study (OR = 1.37; 95 % CI [1.10-1.70]). Pre-existing conditions are all more frequent in older women, with an odds ratio of 1.9 (95% CI 1.4-2.5) according to Joseph [14], whether related to hypertension or diabetes.

Hypertension

In our study, the risk of hypertension was 1.71 times higher in cases compared with controls, with an OR of 1.71 [1.25-2.33]. This finding has been reported in several studies, as gestational

hypertension increases from the age of 40 years in most series, particularly among primiparous women [15, 16, 17]. This hypertension can be explained by cardiac and arterial senescence, as well as lifestyle and dietary factors. Chronic hypertension is significantly more frequent in most series; however, differences regarding diabetes are less consistent and vary according to parity and population [15, 18]. Furthermore, preeclampsia is more frequent in multiparous women aged 40 years, although results vary among authors. In primiparous women over 40 years, the OR remains below 2 compared with younger women. Severe preeclampsia and HELLP syndrome are increased regardless of parity [19], but with a risk multiplier below 2 [9, 12]. In cases of multiple pregnancies obtained through assisted reproductive technology, the risk of moderate or severe preeclampsia is further increased.

Gestational diabetes

We found a prevalence of 12.36 % among cases compared with 0.04 % among controls. Bianco *et al*. [18] reported a frequency of 10.8% in women aged 40 years and older, with an OR of 3.8 [2.7-5.4]. These results confirm the markedly increased risk of diabetes during pregnancy with advancing maternal age, particularly after 40 years. Moreover, gestational diabetes is consistently increased across all series, affecting 7 % of women aged 40-45 years and 12 % beyond this age [20]. Adjustment for body mass index does not modify this risk [21]. According to the AUDIPOG 2002-2003 data [9], the OR for preexisting diabetes was 4.4 (95% CI: 2.6-7.3) when comparing women aged 40-50 years to those aged 20-34 years. An excess of non-insulin-dependent diabetes has also been observed in primiparous women aged 40 years and older compared with younger women aged 20-35 years (10 % versus 2.9 %).

Placenta previa

In our study, placenta previa was observed exclusively in patients aged 40 years and older, with a rate of 7.18 %. In the literature, Mamelle N. *et al*. [22] reported a prevalence of 0.82 % of hemorrhagic placenta previa in women aged 40-50 years, compared with 0.41% in those aged 20-35 years. This pathological placental insertion, more frequent in older pregnant women, may be explained by alterations of the uterine mucosa due to high multiparity and uterine scarring. Placenta previa thus increases with maternal age and affects approximately 2 % of women aged 40 years and older [18, 23], including primiparous women. According to Ananth [3], the risk of placenta previa is nearly nine times higher in women aged 40 years compared with those aged 20 years.

Mode of delivery and perinatal outcomes

The cesarean section rate among cases was 41.38 % (OR = 1.22). Fetal malpresentations are slightly more frequent in this age group [9, 24]. Jolly [20] reported an odds ratio of 1.7 (95 % CI: 1.5-1.9) for breech presentations. Among older parturient, the mode of delivery is characterized by a markedly higher cesarean section rate compared with younger women. This significant finding, with an average twofold increase in risk, affects both primiparous [9, 25] and multiparous women, and applies to both elective and emergency cesarean sections [20]. The elevated cesarean section rate in women aged 40 years and older can be explained by multiple factors: uterine fibroids and history of myomectomy, pregnancy-related complications, malpresentations, macrosomia, induced labor, prolonged and dystocic labor [18, 25], and assisted reproductive technology [26]. Regarding neonatal outcomes, Apgar scores between 8 and 10 at one minute were observed in 73.56% of cases and 76.61% of controls. Mamelle N. *et al*. [22] also found no significant association between Apgar scores and maternal age. Macrosomia was more frequent among older mothers (6.9% vs. 2.54% in controls), consistent with findings from Asma J. *et al*. [27], who reported 18 % vs. 12 %. This may be explained by the higher prevalence of diabetes among women aged ≥40 years. Finally, stillbirth occurred in 13.22 % of cases versus 8.87% of controls (OR = 1.50; 95 % CI [1.09-2.07]), confirming an increased risk of perinatal mortality with advancing maternal age.

Preterm birth

The risk of prematurity (GA < 37 weeks) is increased in some series of women over 35-40 years; however, overall, the difference is not significant compared with younger women. AUDIPOG 2002-2003 data [9] reported a higher risk of prematurity in multiparous women aged 40 years and older (OR 1.39; 95 % CI: 1.2-1.5). Furthermore, neonatal mortality is increased in women aged 40 years and above in some older and more recent series, with a relative risk below 2. However, the difference does not appear substantial due to the generally low neonatal mortality rates in developed countries, and most authors conclude that neonatal outcome remains favorable for the majority of infants [23, 24].

Conclusion

Pregnancy and childbirth at 40 years of age and above represent a high-risk situation for both the mother and the newborn in the African context. In our study, advanced maternal age was associated with increased risks of hypertension, diabetes, placenta previa, anemia, preterm birth, and stillbirth. Although no significant association was found with cesarean delivery, maternal death, or neonatal asphyxia, the overall maternal and perinatal prognosis remains unfavorable. These findings highlight the importance of strengthening antenatal care coverage, improving the management of maternal comorbidities, and raising awareness among women about the risks associated with late pregnancies. Preventive strategies, including family planning and health education, should be promoted to reduce adverse outcomes linked to advanced maternal age.

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Conflict of Interest

Not available

Financial Support

Not available

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