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Maternal and Perinatal Prognosis of Adolescent Pregnancy and Motherhood in Cotonou, Benin

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Abstract

Introduction: Adolescent pregnancy is associated with a high risk due to significant maternal and perinatal complications. **Objective:** To assess the maternal and perinatal outcomes of early motherhood in Cotonou, Benin. **Patients and Methods:** This was a descriptive cross-sectional study with retrospective data collection over a five-year period, from January 1, 2018 to December 31, 2022. Included were parturients aged 10 to 19 years who delivered during the study period and whose medical records were adequately documented. An exhaustive sampling was performed. Data were analyzed using R software version 4.2.2. **Results:** The frequency of early motherhood was 2.45% of all deliveries. Early motherhood is the prerogative of pupils (37.9%) and apprentices (29.3%). The procreators were artisans/workers in (33.5%) and pupils/students in (24.6%). Most of these adolescents were nulliparous (93.7%) and had no medical (90.3%) or surgical history (96.7%). The maternal prognosis was guarded with a mortality of 3.3% and obstetric complications dominated by high blood pressure, eclampsia, and pre-eclampsia. The perinatal prognosis was also guarded with a stillbirth rate of 12.3% and complications, the most frequent of which was low birth weight (31.7%). **Conclusion:** Teenage motherhood is frequent and has a reserved prognosis, with sanitary, social and economic consequences. Its prevention will contribute to achieving the first, third and fifth sustainable development objectives.

Keywords

Early Motherhood, Teenagers, Prognosis, Cotonou

1. Introduction

In 2019, 21 million pregnancies were recorded among adolescent girls aged 15 to 19 years in low- and middle-income countries, and 12 million of these resulted in childbirth [1] [2]. Adolescent maternity is associated with high rates of morbidity and mortality. In West and Central Africa, obstetric complications are among the leading causes of death among adolescent girls aged 15 to 19 years, according to the United Nations Children's Fund [3]. The objective of this study was to assess the maternal and perinatal outcomes of early motherhood in Cotonou.

2. Patients and Methods

This was a descriptive cross-sectional study with retrospective data collection over a five-year period, from January 2018 to December 2022, conducted at the University Clinic of Gynecology and Obstetrics (UCGO) of the Hubert Koutoukou Maga National University Hospital Center in Cotonou, a tertiary-care hospital. We included girls aged from 10 to 19 years who delivered at the hospital during the study period and whose medical records were adequately documented. An exhaustive sampling method was used. The variables of interest concerned sociodemographic characteristics, medical history, clinical features, delivery modalities, and maternal and perinatal morbidity and mortality. Adequately documented records were defined as those in which less than 20% of the data was missing. When some variables were missing from some records, we consulted secondary sources of information, such as the birth register, the hospitalization register, and the emergency obstetric and neonatal care register. When this approach proved insufficient to reduce the proportion of missing data to less than 20% for a variable, this one was removed if it was not essential to the study. Thus, we removed variables such as the residence (municipality of residence), father's occupation, mother's occupation, age at first sexual intercourse, and use of contraception before pregnancy. Data were analyzed using R software version 4.2.2.

3. Results

3.1. Rate of Deliveries among Adolescents (Early Motherhood)

The frequency of deliveries among adolescents was 2.45%.

3.2. Sociodemographic and Clinical Characteristics

The mean age was 17.80 ± 1.20 years, with extremes of 13 and 19 years. Most participants were between 16 and 19 years old (94.10%). A large majority were enrolled in school (89%). Professionally, pupils/students and apprentices were predominant, with respective proportions of 37.90% and 29.30%. Regarding obstetric history, 91.30% were primigravidae and 93.70% were nulliparous. Only 38.87% had attended at least four antenatal care visits (ANC). The prenatal workup was fully completed in 31.62% of cases. However, 22% had not undergone any obstetric ultrasound. The main mode of admission was referral (67.20%). Sociodemographic and clinical characteristics are presented in **Table 1**.

Table 1. Sociodemographic characteristics and obstetric history of adolescents who delivered at CNHU-HKM, Cotonou, 2018-2022.

	Number (N = 427)	Percentage (%)
Age	**N = 427**	**100**
<15	7	1.64
[15 - 19]	420	98.36
Occupation	**427**	**100**
Pupil/Student	162	37.90
Apprentice	125	29.30
Civil servant	37	8.70
Housewife	67	15.70
Merchant	32	7.50
Not specified	4	0.90
Education level	**427**	**100**
Not enrolled	47	11.00
Primary	42	9.84
Secondary	144	33.72
University	34	7.96
Gravidity	**427**	**100**
Primigravida	406	95.08
Paucigravida[1]	20	4.68
Multigravida[2]	1	0.20
Parity	**427**	**100**
Nulliparous	400	93.70
Primiparous	24	5.60
Pauciparous[3]	3	0.70

[1]Paucigravida: women with 2 or 3 previous pregnancies, [2]Multigravida: women with 4 or more previous pregnancies, [3]Pauciparous: women with 2 or 3 previous deliveries.

3.3. Delivery-Related Data

Preterm delivery occurred in 36.53% of cases. The cesarean section rate was 41.69%.

The main indications for cesarean section were severe preeclampsia and eclampsia (24.70%), and acute fetal distress (18.50%). Onset of labor was most often spontaneous (90.30%). Delivery characteristics are presented in Table 2.

Table 2. Distribution of adolescents according to delivery characteristics at CNHU-HKM, Cotonou, 2018-2022.

	Number	Percentage (%)
Gestational age at delivery	**N = 427**	**100**
Preterm[1]	156	36.53
Term[2]	238	55.74
Post-term[3]	33	7.73
Mode of delivery	**N = 427**	**100**
Cesarean section	178	41.69
Vaginal delivery[4]	249	58.31
Type of vaginal delivery	**N = 249**	**100**
Spontaneous	217	87.10
Induced	32	12.90
Type of delivery assistance	**N = 249**	**100**
Spontaneous expulsion	183	73.49
Instrumental delivery	12	4.82
Episiotomy-assisted delivery	54	21.69

Preterm delivery[1]: From 22 weeks of gestation to 36 weeks + 6 days; Term delivery[2]: From 37 weeks to 41 weeks of gestation ; Post-term delivery[3]**:** After 41 weeks of gestation.; **SVD[4]** (Spontaneous Vaginal Delivery): Vaginal delivery.

3.4. Maternal Prognosis

✓ **Maternal Mortality**

Among 427 cases of early motherhood and 385 live births (LB), 14 maternal deaths were recorded, corresponding to a maternal mortality rate of 3.28% and a maternal mortality ratio (MMR) of 3636 deaths per 100,000 LB. The causes of death were eclampsia (35.70%), severe anemia (28.60%), and immediate postpartum hemorrhage (14.30%).

✓ **Maternal Complications During Pregnancy and Delivery**

Pregnancy was complicated in 54.30% of cases. The main conditions identified were hypertensive disorders of pregnancy (15%), eclampsia (13.10%), and anemia (7.30%).

Complications of vaginal delivery included cervical lacerations (2.40%) and perineal tears (2.40%). In the postpartum period, the conditions identified were hypertensive disorders and eclampsia (18.90%), severe anemia (3.40%), and immediate postpartum hemorrhage (IPPH) (3.10%). Complications related to pregnancy and delivery are presented in Table 3.

Table 3. Distribution of adolescents who delivered at CNHU-HKM, Cotonou, 2018-2022, According to maternal complications.

	Number (N)	Percentage (%)
Complications during pregnancy	**427**	**100**
Preeclampsia	64	14.99
Eclampsia	56	13.11
Maternal anemia	31	7.26
Threatened preterm labor	25	5.85
Retroplacental hematoma	24	5.62
Pre-labor rupture syndrome	8	1.87
Premature rupture of membranes[2]	4	0.94
Uterine rupture	1	0.23
No complication	195	45.67
Complications of vaginal delivery	**249**	**100**
Cervical tears	6	2.41
Perineal tears	6	2.41
Postpartum complications[4]	**413**	**100**
Preeclampsia/Eclampsia	78	18.90
Severe anemia	14	3.40
IPPH[5]	13	3.10
Other	15	3.60
Other complication	287	69.50

IPPH[5]: Immediate postpartum hemorrhage.

3.5. Perinatal Prognosis

✓ **Stillbirth**

Out of 439 births, 54 stillbirths were recorded, corresponding to a stillbirth rate of 12.30%.

✓ **Perinatal Morbidities**

Fetal asphyxia was observed in 18.68% of cases. Preterm newborns accounted for 36.50%, 5.50% had an Apgar score at one minute ≤ 3, and 31.70% had a birth weight below 2500 grams. Table 4 presents the main perinatal morbidities.

Table 4. Perinatal morbidities of adolescent mothers at CNHU-HKM, Cotonou, 2018-2022.

	Number (N)	Percentage (%)
Acute fetal asphyxia	**82**	**18.68**
Gestational age at birth	**439**	**100**
Preterm birth	156	35.53
Term birth	283	64.46

Continued

Apgar score at 1 minute	**439**	**100**
≥7	325	74.00
4 - 6	39	8.90
≤3	21	4.80
Birth weight	**439**	**100**
<2500 g	139	31.70
2500 - 4000 g	294	66.90
>4000 g	6	1.40
Newborn morphology	**439**	**100**
Presence of malformation	10	2.28
Absence of malformation	429	97.72
Neonatal unit transfer	**439**	**100**
Yes	95	21.64
No	365	78.36

4. Discussion

4.1. Frequency of Deliveries among Adolescents

The frequency of deliveries among adolescents was 2.45%. This rate is lower than those reported by other authors in sub-Saharan Africa. Hamidou S reported a rate of 3.06% at the Issaka Gazobi Maternity in Niamey; Prosper found 7.7% in Lubumbashi; and Samaké reported 19.61% at the Reference Health Center of Commune VI in the Bamako district [4]-[6]. Tebeu noted a prevalence of 26.5% in northern Cameroon in rural area [7]. Some studies have reported lower rates than ours, notably in Enugu, Nigeria (1.67%), and Kuala Lumpur, Malaysia (1.1%) [8] [9]. In France, the overseas departments record variable rates of adolescent maternity: 6.2% in French Guiana, 3.8% in Réunion, and 4.2% in Guadeloupe [4] [10]. Although sub-Saharan Africa has experienced a general decline in the number of births per woman, adolescent fertility rates remain high in many countries. Each year, children born from girls aged 15 to 19 years account for 16% of all births, according to an UNFPA report [11]. Globally, one in five girls gives birth to her first child before the age of 18 [12].

Several factors contribute to the high rates of pregnancy and childbirth among adolescents, including socioeconomic vulnerability, low levels of education, lack of information and sexual education, forced and early marriages, sexual violence, cultural taboos, stigmatization of girls using contraceptive methods, and difficulties in accessing contraception [12]-[14].

4.2. Sociodemographic Characteristics, Obstetric History, and Pregnancy Follow-Up

In Cotonou, early motherhood primarily affects older adolescents, with a mean

age of 17.80 ± 1.20 years, most of whom are enrolled in school (89%). Antenatal care was limited, with an insufficient number of prenatal visits and incomplete biological and ultrasound assessments. Among the 63.50% who delivered at term or post-term, only 38.87% attended at least four antenatal care visits. Several factors may explain this finding, including lack of financial resources, unawareness of the importance of prenatal care, insufficient family support, and fear of stigmatization by healthcare staff [15]. In the literature, the mean age of adolescents experiencing early motherhood varies but generally ranges between 15 and 19 years [4]-[6] [16]. In many societies, a considerable proportion of girls over 15 years are married, with pregnancy occurring as a consequence of marriage or prompting the union. Consequently, at least 90% of adolescent mothers are married, highlighting the close link between adolescent pregnancy and child marriage [17] [18].

Insufficient prenatal care has been reported by several authors in both developed and developing countries [5] [6] [10] [15] [19]. Poor quality of prenatal follow-up exposes pregnant adolescents to missed identification of pregnancy risk factors, inadequate delivery planning, and an increased risk of obstetric complications, which may adversely affect maternal and perinatal outcomes.

Most of the patients were referred (67.20%). Referrals were due to pregnancy-related complications such as hypertensive disorders, dystocia, and in utero transfer in cases of risk of prematurity, regardless of the specific reason. The center off the study is indeed a level III referral maternity hospital, handling a high proportion of high-risk pregnancies and delivery.

It provides comprehensive emergency obstetric and neonatal care

4.3. Maternal and Perinatal Morbidities

Pregnancy-related complications among adolescents are numerous. The most frequent maternal conditions include anemia, hypertensive disorders of pregnancy and their complications, and threatened preterm labor. Perinatally, low birth weight associated with prematurity and intrauterine growth restriction (IUGR), as well as acute fetal asphyxia, are most commonly reported [5] [6]. Uterine hypovascularization in adolescents, as suggested by some authors, maternal anemia, hypertensive disorders of pregnancy, and smoking may partially explain intrauterine growth restriction and prematurity [16] [20] [21]. Analytical studies have confirmed an increased risk of anemia among adolescents compared with adult pregnant women, plausibly linked to iron deficiency in this population [22]. Puberty, physical growth, and menstrual blood loss increase iron requirements, which are not always met through diet. In adolescents, the nutritional needs of pregnancy are compounded by those of ongoing growth. Regarding hypertensive disorders of pregnancy, a contrast exists between developed and developing countries. In some industrialized countries, the risk of hypertensive disorders in adolescents is not higher compared with adult pregnant women [16] [23], whereas a higher risk is reported in developing countries [5] [24] [25] [26].

Psychologically, the prevalence of depression among adolescent mothers is

twice as high as in adult mothers, ranging from 26% to 68% within three months postpartum [27]. Concerning delivery, most analytical studies conclude an increased risk of cesarean section and episiotomy among adolescents compared with adult parturients. In our series, the cesarean rate appears high (41.69%) compared with other reports, which range from 11.4% to 39.36% [5] [6] [16] [21].

4.4. Maternal and Perinatal Mortality

The maternal mortality rate was 3.28%, with a maternal mortality ratio (MMR) of 3636 deaths per 100,000 live births among adolescents. The causes of death were eclampsia (35.70%), severe anemia (28.60%), and immediate postpartum hemorrhage (14.30%). Maternal mortality rates were lower in other series, and several comparative studies did not find a statistically significant difference compared with adult women [4]-[6] [10] [16]. The high rate of severe obstetric complications, particularly hemorrhagic complications combined with inadequately met transfusion needs, insufficient prenatal care, and critical condition at admission, may explain the elevated hospital maternal mortality observed in our series. The stillbirth rate of 12.30% observed at CNHU-HKM in Cotonou is comparable to that reported by Tebeu at the University Hospital of Yaoundé among mothers under 17 years (11.88%). The influence of maternal age on perinatal mortality risk is variable in the literature. Several studies reported an increased risk of perinatal death in cases of early motherhood [5] [28], whereas others found no significant difference compared with adult parturients [21] [29]. Although the etiology of stillbirth is often undetermined, the high rates of acute fetal asphyxia, post-term delivery, and prematurity among adolescent mothers in various series may explain the increased perinatal mortality risk. Similarly, low socioeconomic status, insufficient prenatal care, maternal anemia, and frequent parasitic and bacterial infections in low-income countries may contribute to stillbirth [29].

5. Conclusion

Early motherhood constitutes a public health problem with well-known contributing factors and severe health, social, and economic consequences for individuals, families, and communities. Its prevention requires a concerted effort and will contribute to achieving the first, third, and fifth Sustainable Development Goals. Preventing early pregnancies will help avoid girls dropping out of school, early marriage, and poverty; it will promote the achievement of women's physical, mental and social well-being, and their empowerment. Comprehensive sexuality education, access to contraception, the removal of barriers to antenatal care and emergency obstetric care for adolescents will help prevent and improve the prognosis of early motherhood [30].

6. Limitations

This study was retrospective and carried out in a single center. The data comes from medical records. This may have introduced information and selection bias,

resulting in an abnormally high number of complicated cases. The absence of a control group of adult women (20 to 35 years old) prevents establishing a causal relationship between the observed maternal and perinatal complications and the young age of the patients in this study. Future research on this topic will address these limitations.

Authors' Contributions

All authors participated in the care of patients and newborns. They were involved in the conception, execution, writing, and revision of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest related to this research.

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