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## Maternal and neonatal complications of childbirth among adolescents at the Sylvanus Olympio University Hospital Centre (CHU-SO), Lomé

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### Introduction

The World Health Organisation (WHO) defines adolescence as a period of human growth and development between childhood and adulthood, between the ages of 10 and 19 years.<sup>1</sup> Globally, the prevalence of pregnancy among people aged 15-19 years varies from region to

**Abstract:** *Objective:* To determine maternal and neonatal complications occurring at childbirth among adolescents.

*Materials and methods:* This is a retrospective, descriptive study conducted from 1<sup>st</sup> July to 31<sup>st</sup> December 2019 at the maternity ward of the Sylvanus Olympio University Hospital Centre (CHU-SO), Lomé, Togo. The socio-demographic parameters of the mothers, details of prenatal and perinatal events and the clinical profile of the newborns at birth were studied.

*Results:* The records of 332 adolescent mothers were studied. The average age of the mothers was  $17.4 \pm 1.5$  years, with a range of 13-19 years. The pregnancies in two-thirds (66.3%) were supervised in centres without surgical facilities and by midwives in 83.1% of cases. A little over half of the mothers (53.3%) attended at least four antenatal clinic sessions, while 3.6% attended none. The modes of delivery were spon-

taneous vaginal (62.3%) and Caesarean section (35.2%). Complications of pregnancy were recorded in 12.9% of the mothers. There were statistically significant associations between the referred status of the mothers and haemorrhages, retained placenta and sepsis ( $p = 0.001, 0.038$  and  $0.011$ , respectively). There were no maternal deaths. The newborn babies required resuscitation in 6.3% of cases, while 7.0% were stillborn. There was a statistically significant relationship between the referred status of mothers and the occurrence of perinatal deaths ( $p = 0.0001$ ).

*Conclusion:* Adolescent mothers are at risk of complications during childbirth, and these risks are increased by poor antenatal care and attempted deliveries in centres without surgical facilities.

**Keywords:** Adolescent, Asphyxia, Perinatal death, Sexual health, Togo.

region. The prevalence rates range from 2% in Pakistan to 26% in Argentina. At the same time, teenage pregnancies under the age of 15 years are only observed in sub-Saharan Africa and Latin America.<sup>2</sup> Worldwide, about 16 million adolescents aged 15 to 19 years give birth each year, and 95% of these births occur in developing countries representing 11% of births globally.<sup>3</sup> A meta-analysis and systematic review of the literature reported the overall prevalence of adolescent pregnancy in Africa as between 18.8% and 19.3% in the sub-Saharan African region.<sup>4</sup> The prevalence rate was higher in East Africa (21.5%) but still lower in North Africa (9.2%).<sup>4</sup> The prevalence rate of adolescent pregnancy was 15.8% in West Africa, with a peak of 51% in Nigeria.<sup>4</sup> In Togo, the overall birth rate among women aged 15 to 49 years was 145.2‰ and 79‰ among adolescent girls.<sup>5</sup>

Pregnancy rate among adolescents aged 15 to 19 years was 11.3%, which comprised 1.3% of live births.<sup>5</sup>

These results are a consequence of early sexual debut in the country where a study conducted in a school environment showed that the average age at sexual debut was 15.2 years for boys and 15.6 years for girls.<sup>6</sup> The circumstances surrounding adolescent childbirth are fraught with risks for both the mother and the baby. A study in Tsévié, Togo, among adolescents under 17 years of age, revealed that 19% of mothers had obstetric complications, and 48.8% of their babies had complications necessitating hospitalisation.<sup>7</sup>

Given the situations of early sexual debut, early pregnancy and obstetric complications among adolescents, this study evaluated the complications related to childbirth among adolescents in the largest national referral centre for maternity services. This is to generate data on childbirth-related morbidities and mortality among Togolese adolescents and their newborn babies, which health policymakers may find helpful. This study aimed to describe the maternal and neonatal complications of childbirth among adolescents in Sylvanus Olympio University Hospital Centre (CHU-SO), Lomé, Togo. The Togolese health system is organised at three levels: the central level (university teaching hospitals and private reference hospitals), the intermediate level (regional hospitals and private hospitals) and the peripheral level (district hospitals and peripheral care units).

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## Materials and Methods

### *Location and design of the study*

The study was conducted at the maternity ward of the Obstetrics and Gynecology Department, Sylvanus Olympio University Hospital, Lomé, Togo. This retrospective, descriptive study covered the period between 1<sup>st</sup> July and 31<sup>st</sup> December 2019.

The hospital records of all the parturients aged 10 to 19 years who gave birth in the facility were included in the study. In contrast, records with missing data and records of parturients with multiple births and gestational age less than 28 weeks were excluded from the study.

### *Sample size determination*

To obtain a representative sample, the Schwartz formula was used as shown below:

$$n = \frac{z^2 \times p(1-p)}{m^2}$$

where n = sample size, z = confidence level (for a 95% confidence level, z=1.96), p = percentage of pregnancy among adolescents in Togo, which is equal to 17%,<sup>8</sup> and m = margin of error = 0.05. Therefore, for an event with a probability of 0.17 with a 95% confidence level and a margin of error of 0.05, the calculated sample size was 217.

### *Data collection and management*

Maternal socio-demographic and obstetric (prenatal, perinatal and postnatal) details and neonatal data (need for resuscitation, need for hospitalization and morbidities) were extracted from the registry and the retrieved case files.

### *Definition of patterns of admission in CHU-SO*

- Admitted patient - a patient who came directly from her home to the maternity unit of CHU-SO.
- Addressed patient - a patient sent from the antenatal care service of CHU-SO to the maternity unit of CHU-SO.
- Referred patient - a patient sent from another hospital to the maternity unit of CHU-SO.

Data analysis and processing were performed using Epi-data 3.1 and Microsoft Excel version 2016 software. The Chi-Square test (Chi<sup>2</sup>) was used to compare categorical variables, and the level of significance was set at p values less than 0.05.

### *Ethical considerations*

Permission was obtained from the Director of the Hospital and the Head of the Obstetrics and Gynecology Department of the CHU-SO for data collection. The files were coded to maintain confidentiality.

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## Results

Out of the 3634 pregnant women who attended the maternity ward of the CHU-SO during the period of study, 636 cases (17.5%) were adolescents, but 332 cases met the inclusion criteria for this study.

### **Socio-demographic profile of the mothers**

#### *Age, level of education, occupation and marital status of adolescent mothers*

The mean age of the mothers was 17.4 ±1.5 years, with a range of 13 to 19 years. Two hundred and eighteen (65.6%) were aged between 18 and 19 years, and 49 (14.7%) were aged less than 16 years. Forty-nine (14.7%) had no formal education, while 127 (38.3%), 147 (44.3%) and 9 (2.7%) had primary, secondary and tertiary levels of education, respectively. About a third (30.1%) were students, while 28.9%, 25.8% and 12.7% were housewives, trainees and retailers, respectively. Two hundred and nineteen (66.0%) were cohabiting, 22.9% (76/332) were single, while 11.1% (37/332) were legally married.

#### *Socio-demographic profile of the spouses*

One hundred and twelve spouses of the subjects (33.7%)

had secondary education, 28 (8.4%) had tertiary education, and 47 (14.2%) were not formally educated. One hundred and eleven spouses (33.4%) were artisans, 37 (11.2%) were students, and 24 (7.2%) were state employees.

*Pregnancy and antenatal care details*

Two hundred and seventy-seven (83.4%) of the mothers were primigravida, and 55 multigravida (16.6%). Three hundred (90.3%) subjects were nulliparous. Of the 55 adolescents who were multigravida, 12 had an interpregnancy interval of less than 24 months.

One hundred and seventy-seven (53.3%) of the mothers had at least four antenatal clinic attendances, while 143 (43.1%) had less than four attendances, and 12 (3.6%) did not attend antenatal clinic. The average gestational age at antenatal care booking was 21 weeks. The mothers commenced antenatal care before 15 weeks of gestation in 45 (13.6%) cases, between 15 and 28 weeks of gestation among 212 (63.9%) cases, and after 28 weeks of gestation among 34 (10.2%) cases. For 41 mothers, the gestational age at antenatal clinic booking was not recorded.

Two out of three (66.3%) pregnancy centres were medical-social centres (Table 1). Of the 29 mothers less than 1.50 m tall, 23 were monitored in centres without a surgical unit (20 social and medical centres and three birthing centres or maternity homes). The pregnancies were monitored by obstetricians (11; 3.4%), general practitioners (3; 1%), midwives (276; 83.1%) and birth attendants (42; 12.5%).

Forty-three (12.9%) mothers had complications of pregnancy such as preterm contractions (23; 6.9%), eclampsia and pre-eclampsia (18; 5.4%), retroplacental haematoma (2; 0.6%) and placenta previa (1; 0.3%).

*Labour and delivery details*

One hundred and ninety-seven (59.3%) of the subjects were referred to CHU-SO, while 116 (35%) and 19 (5.7%) were admitted and addressed, respectively.

Among the referred cases, the reasons for referral included acute fetal distress (27; 8.1%), unavoidable premature delivery (27; 8.1%), excessive uterine height associated with prolonged pregnancy (25; 7.5%), severe pre-eclampsia (16; 4.8%), premature rupture of membranes (14; 4.2%), contracted pelvis (12; 3.6%), and primiparity with breech presentation (12; 3.6%).

The mode of delivery was spontaneously vaginal (62.3%), instrumental vaginal (2.5%) and Caesarean section (35.2%). Contracted pelvis (18.8%), preeclampsia/eclampsia (18.0%), and acute foetal distress (13.7%) were the leading indications for Caesarean section.

*Maternal postpartum complications*

The complications recorded in the mothers included perineal tears (n = 23) and episiotomy (n = 59 cases). Estimated blood loss was less than 500ml among 320

(96.4%) mothers, between 500 and 1000ml for 6 (1.8%) and greater than or equal to 1000ml among 6 (1.8%). Among the referred mothers, 23 (6.9%) had soft tissue tears, 12 (3.6%) had a postpartum haemorrhage, and 11 (3.3%) had sepsis. In the admitted group, 15 (4.5%) had soft tissue tears, 3 (0.9%) had a postpartum haemorrhage, and only 1 (0.3%) had sepsis. Postpartum haemorrhage and sepsis were more frequent among referred mothers (p = 0.001 and p = 0.012 respectively) (Table 2).

*Perinatal outcome of the babies*

The newborn babies comprised 187 males and 145 females, giving a male-to-female ratio of 1.2:1. Two hundred and eighty-eight (86.7%) babies did not require resuscitation, while 21 (6.3%) required resuscitation. Twenty-three (7.0%) were stillborn, and 3 (0.9%) babies died in the delivery room. The mean weight of the babies was 2770 ± 584g. The birth weight was less than 2500g in 86 (25.9%), 2500 to 3500g in 216 (65.1%), 3500 to 4000g in 24 (7.2%) and greater than 4000g in 3 (0.9%). The weights of three babies were not recorded.

Forty-one babies (12.3%) sustained birth injuries which included serosanguinous bump (n = 37) and subconjunctival haemorrhage (n = 4). One hundred and fifteen (37.2%) babies were hospitalised in the paediatric ward for various reasons (such as sepsis, prematurity, perinatal asphyxia and intra-uterine growth restriction) with a case fatality rate of 1%.

Referred mothers had significantly higher frequencies of perinatal deaths (20; 10.2%) than admitted mothers (5; 3.5%) (p = 0.0001) (Table 3).

**Table 1:** Distribution of adolescent mothers according to types of maternity centres

	Number (n=332)	Percentage (%)
Medical-social Centre	220	66.3
University Teaching Hospital	51	15.4
Birthing House	27	8.1
Clinic without surgical facility	10	3.0
Regional Hospital Centre	10	3.0
Peripheral Care Unit	8	2.4
Prefectural Hospital Centre with a surgical facility	6	1.8

**Table 2:** Relationship between mode of admission and maternal complications

	Admission mode				p-value
	Admitted N = 116	Addressed N = 19	Referred N = 197	Total N = 332	
Perineal tears	15 (12.9%)	1 (5.3%)	7 (3.6%)	23 (6.9%)	0.091
Postpartum haemorrhage	3 (2.6%)	0 (0.0%)	9 (4.6%)	12 (6.1%)	0.001
Sepsis	1 (0.9%)	0 (0.0%)	10 (5.1%)	11 (5.6%)	0.011
Severe anaemia	0 (0.0%)	0 (0.0%)	7 (3.6%)	7 (3.6%)	1.021
Postpartum eclampsia	2 (1.7%)	0 (0.0%)	1 (0.5%)	3 (1.5%)	0.154
Placental Retention	0 (0.0%)	0 (0.0%)	2 (1.0%)	2 (1.0%)	0.038
Oedemato-ascitic syndrome	1 (0.9%)	0 (0.0%)	0 (0.0%)	1 (0.5%)	0.822
Severe preeclampsia	1 (0.9%)	0 (0.0%)	0 (0.0%)	1 (0.5%)	0.339

**Table 3:** Relationship between maternal mode of admission and neonatal complications

	Admission mode				p-value
	Admitted N = 116	Addressed N = 19	Referred N = 197	Total N = 332	
Perinatal asphyxia	4 (3.5%)	1 (5.3%)	24 (12.2%)	29 (8.7%)	0.053
Perinatal deaths	5 (4.3%)	1 (5.3%)	20 (10.2%)	26 (7.8%)	0.0001

## Discussion

The mean age of the adolescent mothers in this study was 17.4 ± 1.4 years, similar to the findings of 17.6 ± 1.2 years in Congo,<sup>9</sup> and 17.7 ± 1.3 years in multi-centre research across 29 countries in Africa, Asia, America and the Middle East.<sup>10</sup>

These results suggest that adolescent pregnancy is a major public health problem worldwide. In resource-limited countries, some of the factors predisposing to teenage pregnancy include lack of sex education, lack of use of modern contraceptive methods, traditions, socio-economic dependence of women, peer influence, multiple sexual partnerships, and early sexual debut before the age of 13 years.<sup>11-14</sup>

The first antenatal clinic visit aims to confirm the pregnancy, assess risk factors, and schedule follow-up care. In the present study, the average estimated gestational age at antenatal care booking was 21 weeks. Close to two-thirds (63.9%) and 10.2% of the adolescent mothers commenced antenatal care at an estimated gestational age of 15-28 weeks and later than 28 weeks, respectively. This delay in antenatal care booking was also recorded among adolescents in France, where the average estimated gestational age at antenatal care booking was 28.9 ± 7.9 weeks in mothers under 16 years of age and 26.5 ± 8.3 weeks in mothers aged 16-18 years.<sup>13</sup> The delay in booking for antenatal care could be explained by the embarrassment of announcing the unplanned pregnancy, the immaturity in terms of pregnancy management and the absence of health facilities for young people. Also, the late commencement of antenatal care may be a fallout of possible disputes surrounding these pregnancies, which are often not planned.<sup>15, 16</sup> In the present study, more than half of the adolescent

mothers (59.3%) were referred to CHU-SO. The findings are superior to those of Fouelifack *et al.*<sup>9</sup> in Cameroon and Luhete *et al.*<sup>11</sup> in Congo, who in comparative studies reported 6.4% of adolescents versus 4.3% of adults and 7.7% of adolescents versus 5.1% of adults, respectively. The fact that more than half of the adolescent mothers were referred in this study can be explained by the choice of antenatal care centres. Indeed, only 20% of the adolescent mothers were followed up in a centre with a surgical facility. Pregnant women are routinely referred to CHU-SO, the only referral centre in the region. This observation is also justified by the unfavourable socio-economic conditions of pregnant adolescents and their spouses, who often patronise poorly equipped and sometimes unlicensed care centres, using unqualified or poorly qualified providers and often close to their homes to minimise the cost of care. These centres often lack surgical facilities and are unable to manage obstetric complications.<sup>17</sup>

In the present study, a little above one adolescent mother out of three (35.2%) gave birth by Caesarean section. This Caesarean section rate is twice as high as those reported in Cameroon, Congo and France (16.6%, 11.4% and 13.72%, respectively).<sup>9, 11, 18</sup> The high Caesarean section rate in the present study may be explained by the fact that 59.3% of adolescent mothers were referred and presented with emergencies. In the Cameroonian and Congolese reports, only 7.7% and 6.4% of teenage mothers were referred for childbirth.<sup>9, 11</sup> Therefore, if antenatal care is not accessed in centres with surgical branches, delivery of these adolescent mothers should take place at the same centre to improve the materno-foetal prognosis.

One adolescent mother out of four had a perineal tear or an episiotomy, indicating difficulty in delivering the foetus. These results are similar to those of Fouelifack *et al.* and Egbe *et al.* in Cameroon, who reported 30.5% and 22.3%, respectively,<sup>11, 19</sup> but lower than 39.1% reported by Luhete *et al.* in Congo.<sup>9</sup> The bony pelvis and the soft tissues form crucial parts of the birth canal that may influence the process of childbirth, particularly in the adolescent.<sup>9, 11, 19</sup> The obstetric complications are often aggravated by lack of antenatal care, poor quality supervision during antenatal care and late referrals that often require emergency care.

Perineal tears and episiotomies can be the cause of

haemorrhages during childbirth. The present study recorded a haemorrhage in 3.2% of cases. Several studies have reported that postpartum haemorrhage is not peculiar to adolescent mothers.<sup>2, 10, 11, 15, 18</sup> However, late commencement of antenatal care and poor attendance of antenatal clinics, attempted childbirth in centres without surgical facilities and late referrals are all risk factors for these haemorrhages. In the same vein, this study observed that referred adolescent mothers had had incidences of haemorrhage, placental retention and sepsis. The reinforcement of sexual education and the popularisation of contraceptive methods, which are underway in Togo and the initiative on free care for pregnant women, are all current efforts geared toward improving adolescents' sexual and reproductive health.

Adolescent pregnancies are often accompanied by threats to childbirth, sometimes unavoidable, resulting in preterm births.<sup>13, 18</sup> In this study, close to one-fifth of the newborns were preterm, similar to the findings of Tamambang *et al.*<sup>19</sup> and Egbe *et al.*<sup>20</sup>, who reported preterm delivery rates of 12.2% and 13.5%, respectively. Similarly, these two studies reported significantly more preterm deliveries among adolescents than adults.<sup>19, 20</sup> The social difficulties experienced by adolescent mothers, namely financial difficulties responsible for poor utilisation of quality antenatal care services, travel with inappropriate means of transportation for pregnant women and stress, are all reasons that could explain the high number of preterm deliveries. These premature deliveries, which often require prolonged hospitalisation and a high cost of care, also worsen the parents' economic conditions, thus creating a vicious socio-economic circle.

In this study, only 6.3% of the newborn babies required resuscitation, and less than one per cent died in the delivery room. This success of resuscitation in the delivery room is the result of the reinforcement of skills in this area undertaken in recent years to improve the survival of newborns at birth.<sup>21</sup> Perinatal asphyxia was more common among the babies of referred adolescent mothers, although the difference lacked statistical signifi-

cance. This finding justifies the need for delivery centres to have surgical facilities. The occurrence of perinatal asphyxia in newborn babies of adolescent mothers is variously reported in the literature. In France, the occurrence of perinatal asphyxia in this group of babies was not significant in a case-control study.<sup>18</sup> Still, in Congo<sup>9</sup> and Cameroon,<sup>20</sup> this difference was statistically significant in favour of newborns of adolescent mothers. Despite the lack of statistical significance in the presents study, perinatal asphyxia occurs more frequently in the babies of adolescent mothers compared to the babies of older women.<sup>9, 18, 20</sup> The immaturity of the pelvis and the delay in the commencement of routine antenatal care due to non-desire of the pregnancies could explain the frequent occurrence of perinatal asphyxia in the newborn babies of adolescent mothers.

The perinatal death rate in this study was less than one-tenth (7.8%), similar to the reports of 6.4% in Congo by Luhete *et al.*<sup>9</sup> and 10.4% in Cameroon by Fouelifack *et al.*<sup>11</sup> Studies have also reported that the risk of perinatal death is twice as high for newborns of mothers under 20 years of age.<sup>9, 11</sup> Therefore, the present study also reported that referred adolescent mothers recorded significantly more perinatal deaths among their babies.

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## Conclusion

This study determined the spectrum of complications related to pregnancy and childbirth among adolescent mothers. The study also noted that teenage pregnancies were generally poorly supervised, even though this is not peculiar to only adolescents in the country. Strengthening the sexual health policy for adolescents with a large-scale popularisation of family planning services and the sensitisation of community leaders against early marriages may help reduce adolescent pregnancies.

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