

# Features and Patterns of Primipara Delivery in a Cameroon Semi-Rural Area: The Case of Ayos Locality

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**How to cite this paper:** Nyada, S.R., Ebong, C.E., Ntsama, J.A.M., Mendoua, M., Nsahlai, C., Mboua, V., Emenguele, P.M., Tompeen, I., Belinga, E. and Ndoua, C.C.N. (2023) Features and Patterns of Primipara Delivery in a Cameroon Semi-Rural Area: The Case of Ayos Locality. *Open Journal of Obstetrics and Gynecology*, 13, 64-73.

<https://doi.org/10.4236/ojog.2023.131007>

**Received:** December 12, 2022

**Accepted:** January 27, 2023

**Published:** January 30, 2023

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## Abstract

**Introduction:** The delivery of a primipara, a woman giving birth for the first time, is challenging and may lead to complications and influence the obstetrical future of a woman. **Materials and Methods:** We carried out a cross-sectional and analytical study at the maternity of the regional hospital annex of Ayos, a semi-rural locality in Cameroon, for the period between January 2012 and December 2020. The objective was to determine the frequency and the determinants of primipara delivery. **Results:** We recruited 440 cases. The frequency of primipara delivery was 31.8%. The ages of the participants ranged from 12 to 35 years with a mean age of  $18.01 \pm 3.52$  years. Single women contributed to 95.5% of cases while 97.5% were unemployed. The delivery occurred at term in 90.2% and 98.4% of pregnancies were singleton. The delivery was vaginal in 91.6%, while caesarean delivery was done in 8.4% (8% emergency and 0.4% elective). The most frequent maternal complications were genital tract tears (15.7%), post-partum hemorrhage (12.5%) and endometritis (2.7%). The birth weight of newborns ranged from 1070 to 4500 g with a mean of  $3024.5 \pm 511.4$  g. The single marital status, a gestational age between 37 and 42 weeks and a birth weight between 1500 g and 2499 g were significantly associated with vaginal delivery. **Conclusion:** The frequency of primiparous delivery was relatively high (31.8%) in the Ayos semi-rural health district of Cameroon. Major complications associated with delivery included

genital tract tears, post-partum hemorrhage, cesarean section and neo-natal infection.

## Keywords

Primipara, Delivery, Complication, Semi-Rural, Cameroon

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## 1. Introduction

The proportions of modes of delivery of primiparous women differ from country to country, as well as between developing and developed countries. There may also be differences between rural and urban settings within the same country. In the United States for example, one third of women deliver by cesarean route at first childbirth [1]. Vaginal delivery in primiparous women is associated with many maternal and fetal complications such as prematurity, low birth weight, instrumental delivery and anal sphincter tear [2] [3] [4] [5]. Cesarean delivery, on the other hand, which is mandatory in some cases for the preservation of maternal and fetal health, is associated with an increased risk of well-known complications such as infection, thromboembolism, abnormal placentation in later pregnancies and need for hysterectomy. In addition, pregnancy and childbirth may decrease pelvic floor tone shortly after the first delivery, leading to urinary incontinence and dyspareunia. Vaginal birth is known to be the most frequent risk factor for pelvic floor dysfunction, alongside life-style, smoking, and being overweight [6]. Furthermore, the mode of delivery of a primiparous woman may have an impact on the choice of a delivery route in future pregnancies and contribute to maternal morbidity.

Studies in some Cameroonian semi-rural settings have suggested that being a primiparous adolescent woman increases the likelihood of having a low birth weight neonate compared to their multiparous counterparts [7]. Another study revealed that primiparous women aged 27 years and above have a significantly increased risk of cesarean section, instrumental delivery and poor neonatal outcome [8].

The objectives of this study were to determine the frequencies of various modes of delivery among primiparous parturients, the frequency of complications and the determinants of delivery, in a semi-rural setting of Cameroon.

## 2. Materials and Methods

We carried out a hospital-based cross-sectional and analytical study at the maternity of the regional hospital annex of Ayos for the period between January 2012 and December 2020. The Ayos regional hospital annex is the major reference facility in this semi-rural locality. The medical staff included one obstetrician, five general practitioners, six nurses and two operating room nurses. Women were admitted after delivery for two days for routine follow-up at the facility.

*Operational definitions:*

Primipara: here refers to a woman who has given birth only once or is coming to deliver for the first time.

Nullipara: here refers to a woman who has never given birth.

Parturient: refers to a woman in labor.

*Sampling:*

Sampling was consecutive and exhaustive as all women who satisfied our selection criteria (primiparous women in post-partum period and nulliparous women in labor) were included. Accordingly, we did not calculate the sample size. The inclusion criteria were women delivered at the maternity of the regional hospital annex of Ayos during the period of the study, being primiparous, and having postpartum follow-up at the same facility. The exclusion criteria were: incomplete files, missing files and refusal of a parturient to participate.

*Variables of the study:*

The data were collected from patients' medical files and medical reports in the delivery and operating rooms. The variables of the study were:

- Socio-demographic characteristics of parturients: age, marital status, occupation.
- Medical history: parity, past pregnancies, HIV status.
- Delivery parameters: gestational age, use of partograph, route of delivery.
- Maternal outcomes: complications.
- Fetal outcomes: birth weight, APGAR score, gender.

*Analysis:*

Data were entered at the end of the collection process in the Sphinx Millennium 4.5. software for PC Computer. The statistical analysis was performed by validation of the data base and importing into Excel and EPI Info 7.2.3.0 software. Categorical variables were reported as frequencies and percentages, while numerical variables were presented as means with their corresponding standard deviations (SD) and ranges. The Student's t-test and Fisher's exact test were used for comparison. P-values below 5% were considered statistically significant.

*Ethical considerations:*

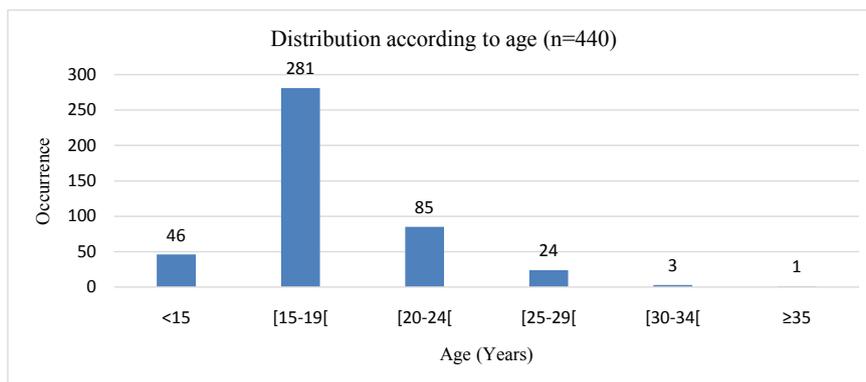
To minimize ethical concerns, we avoided the use of identification information. We also obtained authorization from health facility authorities and consent from all participants before their inclusion.

### 3. Results

We identified 440 deliveries by primiparas out of 1384 deliveries. Thus, primiparous delivery accounted for 31.8% of deliveries during the period of study. The mean age of these clients was  $18.01 \pm 3.52$  years (range 12 - 35 years). **Figure 1** shows the distribution of these parturients according to age.

#### 3.1. Socio-Demographic and Obstetrical Parameters

Socio-demographic characteristics show that 95.5% of parturients were single; 66.3% had a primary level education and 97.5% were unemployed (**Table 1**).



**Figure 1.** Distribution according to age of primiparous parturients.

**Table 1.** Socio-demographic characteristics of parturients.

| Variables                     | Category    | Occurrence (n = 440) | Proportion (%) |
|-------------------------------|-------------|----------------------|----------------|
| <b>Marital status</b>         | Single      | 420                  | 95.5           |
|                               | Married     | 20                   | 4.5            |
| <b>Education</b>              | Primary     | 292                  | 66.3           |
|                               | High school | 146                  | 33.2           |
|                               | University  | 2                    | 0.5            |
| <b>Remunerated employment</b> | No          | 429                  | 97.5           |
|                               | Yes         | 11                   | 2.5            |

Pregnancy and delivery data are shown in **Table 2**. In 90.2% of cases, delivery occurred at term. Premature deliveries accounted for 8.9% of cases. A singleton pregnancy was recorded in 98.4%. The partograph was properly used during labor in 82 parturients (18.6%).

The HIV status was known in 404 cases. The result was negative in 385 cases and positive in 19 cases, giving a prevalence of 4.7% in our sample. Refusal to do the test (24 cases) and shortage of stock (12 cases) are the reasons why some parturients did not perform the test.

Cesarean delivery represented 8.4% of all deliveries in the group, with emergency cesarean in 8% and elective cesarean in 0.4%. The indications for emergency cesarean section were a non-reassuring fetal heart rate in 37.1%, cephalo-pelvic disproportion in 31.5%, abnormal fetal presentation in 20%, and ante-partum hemorrhage in 11.4%.

### 3.2. Maternal Complications of Delivery

Genital tract tears (15.7% of cases), post-partum hemorrhage (12.5%), and endometritis (2.7%) dominated maternal complications. The progress was favorable in all these cases. No maternal death was recorded during the study (**Table 3**).

**Table 2.** Pregnancy, labor, and delivery parameters.

| Variables               | Category           | Occurrence (n = 440) | Proportion (%) |
|-------------------------|--------------------|----------------------|----------------|
| Gestational age (Weeks) | <37                | 39                   | 8.9            |
|                         | 37 - 42            | 397                  | 90.2           |
|                         | >42                | 4                    | 0.9            |
| Type of gestation       | Singleton          | 433                  | 98.4           |
|                         | Twin               | 7                    | 1.6            |
| Antenatal consultations | 0                  | 68                   | 15.5           |
|                         | 1                  | 39                   | 8.9            |
|                         | 2                  | 32                   | 7.2            |
|                         | 3                  | 75                   | 17.1           |
|                         | 4                  | 109                  | 24.8           |
|                         | >4                 | 117                  | 26.6           |
| Partograph use          | Yes                | 82                   | 18.6           |
|                         | No                 | 358                  | 81.4           |
| Mode of delivery        | Per vaginal        | 403                  | 91.6           |
|                         | Emergency cesarean | 35                   | 8              |
|                         | Elective cesarean  | 2                    | 0.4            |

**Table 3.** Maternal complications of delivery.

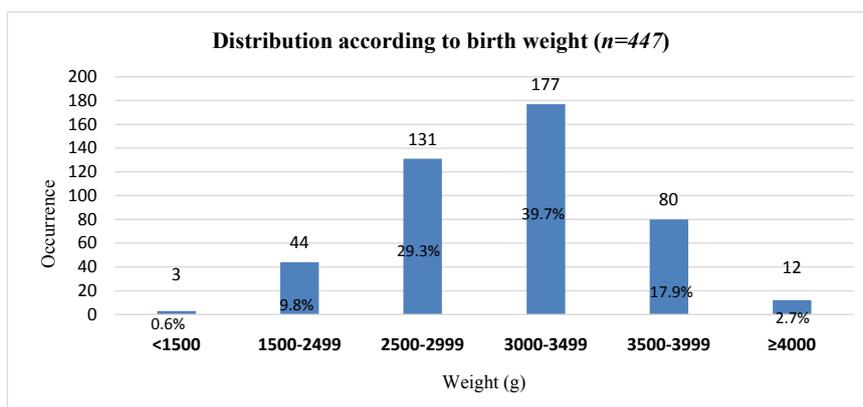
| Complications          | Occurrence (n = 440) | Proportion (%) |
|------------------------|----------------------|----------------|
| Genital tract tears    | 69                   | 15.7           |
| Post-partum hemorrhage | 55                   | 12.5           |
| Endometritis           | 12                   | 2.7            |
| Wound infection        | 5                    | 1.1            |
| Eclampsia              | 3                    | 0.7            |
| Uterine rupture        | 1                    | 0.2            |
| Symphiotomy            | 1                    | 0.2            |

### 3.3. Fetal Outcome of Delivery

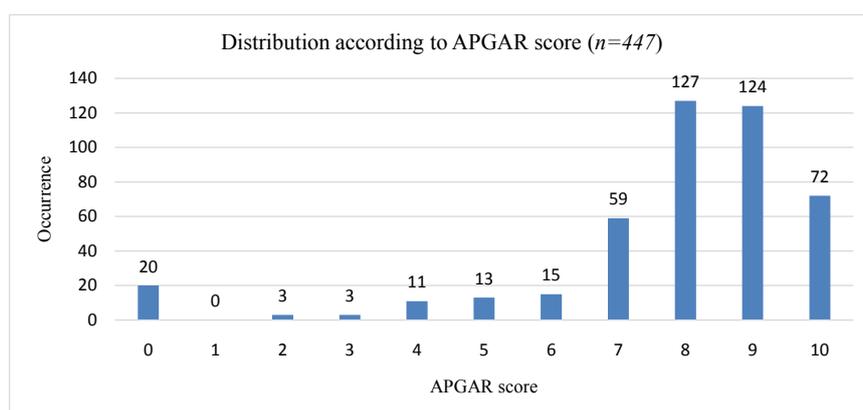
The mean birth weight of the newborns was  $3024.5\text{g} \pm 511.4$  (range 1070 g - 4500 g) (**Figure 2**). The mean APGAR score at five minute was  $7.8 \pm 2.3$  (**Figure 3**), the modal classes are represented by an APGAR score of 8 and 9, with 127 and 124 cases, respectively.

The most frequent fetal complications were neonatal infection, asphyxia, perinatal death and prematurity, with proportions of 12.7%, 4.5%, 4.2% and 3.5%, respectively (**Table 4**).

The perinatal mortality ratio was 49.2 per 1000 live births. Exclusive breast-feeding was preferred in 417 cases (94.6%), formula milk in 2 cases (0.5%) and mixed feeding in 21 cases (4.9%).



**Figure 2.** Distribution of newborns according to birth weight.



**Figure 3.** Distribution according to APGAR score.

**Table 4.** Fetal complications.

| Complications             | Occurrence (n = 447) | Proportion (%) |
|---------------------------|----------------------|----------------|
| Neonatal infection        | 57                   | 12.7           |
| Neonatal asphyxia         | 20                   | 4.5            |
| Perinatal death           | 19                   | 4.2            |
| Prematurity               | 16                   | 3.5            |
| Jaundice                  | 5                    | 1.1            |
| Intra-uterine fetal death | 3                    | 0.6            |

### 3.4. Determinants of Vaginal Delivery

Factors significantly associated with vaginal delivery are summarized in **Table 5**. Neither the age of the parturient nor the level of education significantly influenced the chances of vaginal delivery. Regarding the marital status, being single was significantly linked with the success of vaginal delivery ( $p = 0.01$ ). A gestational age between 37 and 42 weeks was found in 365 parturients having a vaginal delivery (OR 1.5;  $P = 0.03$ ). A fetal birth weight of 2500 - 3499 g was recorded in 279 cases of vaginal delivery (OR 1.2;  $p = 0.06$ ). However, the strongest association with vaginal delivery was observed for a birth weight of 1500 - 2499 g (OR 0.8;  $P = 0.04$ ).

**Table 5.** Determinants of delivery route.

| Variables                              | Vaginal delivery | Cesarean | OR (95% CI) | P-value         |             |
|--|------------------|----------|-------------|-----------------|-------------|
| <b>Age of parturient (years)</b>       | <15              | 41       | 5           | 0.7 (0.2 - 1.9) | 0.07        |
|  | [15 - 19[        | 259      | 22          | 1.2 (0.6 - 2.4) | 0.42        |
|  | [20 - 24[        | 78       | 7           | 1 (0.4 - 2.4)   | 0.07        |
|  | [25 - 29[        | 21       | 3           | 0.6 (0.1 - 2.1) | 0.09        |
|  | [30 - 34[        | 3        | 0           | -               | -           |
|  | [35 - 39[        | 1        | 0           | -               | -           |
| <b>Marital status of parturient</b>    | Single           | 385      | 35          | 1.2 (0.2 - 5.4) | <b>0.01</b> |
|  | Married          | 18       | 2           | 0.8 (0.1 - 3.6) | 0.06        |
| <b>Educational level of parturient</b> | Primary          | 270      | 22          | 1.3 (0.6 - 2.7) | 0.18        |
|  | High school      | 131      | 15          | 0.7 (0.3 - 1.4) | 0.47        |
|  | University       | 2        | 0           | -               | -           |
| <b>Gestational age (weeks)</b>         | <37              | 34       | 5           | 0.5 (0.2 - 1.6) | 0.87        |
|  | 37 - 42          | 365      | 32          | 1.5 (0.5 - 4)   | <b>0.03</b> |
|  | >42              | 4        | 0           | -               | -           |
| <b>Birth weight (g)</b>                | <1500            | 3        | 0           | -               | -           |
|  | 1500 - 2499      | 39       | 4           | 0.8 (0.2 - 2.6) | <b>0.04</b> |
|  | 2500 - 3499      | 279      | 24          | 1.2 (0.6 - 2.4) | 0.06        |
|  | 3500 - 3999      | 73       | 6           | 1.1 (0.4 - 2.8) | 0.06        |
|  | >4000            | 9        | 3           | 0.2 (0.06 - 1)  | 3           |

#### 4. Discussion

We found a frequency of delivery of primiparous women of 31.8%. This is higher than the 19.9% proportion reported in a similar study done in an urban setting, Lubumbashi, by Kakudji *et al.* [9] and may suggest a lower fecundity for our target population.

The mean primiparity age was 18.01 years  $\pm$  3.52. In a publication on adolescent childbirth in Cameroon, Njim *et al.* identified a similar mean age, 17.8 years  $\pm$  1.3 [7]. However, this is much lower than the mean age of primiparity of 30.8  $\pm$  5.2 years reported in a study done in Chile on the prevalence of anal sphincter lesions after childbirth [2].

Concerning the mode of delivery for primiparous women, we found a vaginal delivery proportion of 91.6%, while cesarean delivery was done in 8.4%. This figure is higher than the national cesarean rate of 3.5% reported by the national demographic survey in 2018 [10]. Guzman Rojas *et al.* reported a cesarean rate of 22.8% and a vaginal delivery rate of 77.2%. The same author observed a frequency of instrumental delivery, with either forceps or vacuum extractor, of 23.2% [2]. This higher recourse for cesarean delivery and requirement for in-

strumental assistance for vaginal delivery may be in relation to the increased maternal age for the first pregnancy reported by the same study [2]. Trabelsi *et al.* noted that primiparous women contributed to 40.4% of overall cesarean rate in Sfax, Tunisia [11].

Our study showed that the predominant maternal complications among primiparous women were perineal tears (15.7%), post-partum hemorrhage (12.5%), endometritis (2.7%), surgical site infection (1.1%), eclampsia (0.7%) and uterine rupture (0.2%). According to the study by Guzman Rojas *et al.*, perineal tears were observed in 49% of vaginal deliveries of primiparas. There were first (13.4%), second (30.8%) and third (4.9%) degree perineal tears. The same authors observed fecal incontinence in 3.4%, uterine prolapse in 4.7% and external anal sphincter defects in 27.9% after vaginal delivery [2]. However, Kemfang *et al.* noted that parturient's age does not influence the occurrence of obstetrical and perinatal complications in primiparas. They found that delivery of primiparas above 40 carries same complications as that of primiparas between 20 and 29 years [3]. Dahl *et al.* also noted that there is no association between parturient's age and occurrence of anal sphincter tear. They reported instrumental delivery as a major risk factor for anal sphincter tear [12].

We did not observe any maternal death during our study. However, Fomulu *et al.* reported that maternal mortality ratio was highest in nulliparas, with 841 deaths per 100,000 live births. Ignorance of the functioning of the health system and poor preparation for delivery were suggested to explain the situation [13]. The availability of an obstetrician, as well as other staff involved in delivery and prenatal care, the modesty of fees paid for these services, the small number of deliveries per month and the possibility of referral of high-risk cases to the main regional hospital may have all contributed to this result.

## 5. Limits

Our study had a predominant retrospective component. Some determinants of delivery could not be analyzed. These include the duration of labor, use of oxytocics, and degrees of perineal tears. In addition, the lack of comparison with other groups, due to unavailable data, makes it difficult to attribute trends to the group.

## 6. Conclusion

There proportion of primiparous women (31.8%) among parturients of the semi-rural locality of Ayos in Cameroon is relatively high, and the mean age of parturients was relatively low (18.01 years). The mean birth weight of newborns was 3024.5 g and significant complications associated with delivery included genital tract tears, post-partum hemorrhage, cesarean section and neo-natal infection. Factors significantly associated with vaginal delivery include a single marital status, a gestational age between 37 and 42 weeks and a birth weight between 1500 and 2499 g.

## Authors' Contributions

All authors participated in the design of the study, data acquisition, analysis of results and editing the manuscript.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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