

# Experience of Analgesia during Labour in a Sub-Saharan Hospital Setting

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## Abstract

The pain experienced during labour varies from one person to another. The objective of this study is to evaluate the experience of analgesia during labour in three maternity hospitals in Cameroon. **Methodology:** This was a cross-sectional analytical study conducted over 4 months, from 1 December 2019 to 31 March 2020, at the Yaoundé Gynaecological-Obstetric Hospital, the Yaoundé Central Hospital and the Douala General Hospital. We compared 35 parturients who delivered vaginally under analgesia and 79 parturients who delivered without analgesia. The data collected were compared using Chi 2 and Fischer tests with a significance level of  $P < 0.05$ . **Results:** Parturients aged 30 - 40 years ( $P = 0.03$ ), public sector employees ( $P = 0.002$ ) and private sector employees ( $P < 0.0001$ ). Parturients with a minimum monthly income of 200,000 FCFA ( $P < 0.0001$ ; OR = 8 IC = 95%). were likely to use analgesia during labour The frequency of delivery under analgesia was 30.7%. The pain was less severe in the VAS of parturients on APD during expulsion ( $1.6 \pm 1.0$  versus  $5.4 \pm 0.9$ ;  $P < 0.001$ ). We observed paresthesias of the lower limbs more frequently in the exposed women (RR = 5.9; 95% CI = 1.85 - 18.99;  $P = 0.002$ ) and prolonged expulsion phase of labour (RR = 3.6; 95% CI = 1.43 - 9.31;  $P = 0.004$ ). Parturients under analgesia showed more anxiety or stress

(RR = 3.56; 95% CI = 1.26 - 10.0; P = 0.016), happiness (RR = 3.2; 95% CI = 1.42 - 7.40; P = 0.004), self-confidence (OR = 14.97; 95% CI = 3.9 - 58.29; P < 0.001) and fear (RR = 2.23; 95% CI = 0.91 - 5.46; P = 0.065). **Conclusion:** Analgesia delivery offers a better birth experience, however it may have negligible side effects.

## Keywords

Experience, Analgesia, Labour, Pain

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## 1. Introduction

Childbirth is the set of phenomena that result in the exit of the foetus and its appendages from and through the genital tract [1]. Pain is present during pregnancy and childbirth for many women. According to the official definition of the International Association for the Study of Pain, pain is *an unpleasant sensory and emotional experience* associated with or described in terms of actual or potential tissue damage [2]. Childbirth causes intense pain and the vast majority of women associate childbirth with a painful event. The main factors responsible for labour pain are cervical dilation, uterine contractions, and distension, distension of the genital tract and perineum, stretching or compression of surrounding anatomical structures such as the peritoneum, bladder, urethra, rectum, or the roots of the lumbosacral plexus [3]. An analgesic is a drug used to relieve pain. It was from the 17th century onwards that the desire to alleviate the pain of childbirth gradually emerged. Initially, it was a question of putting in place simple means to put the woman at ease, consisting of ensuring the quality of the material and psychological environment around her (comfort, reassurance, etc.) [4]. Nowadays there are several techniques of analgesia for childbirth, namely parenteral analgesia, peripheral nerve blocks (the paracervical block, which allows the interruption of nerve impulses from the inferior hypogastric plexus opposite each cervical-vaginal cul-de-sac block; the pudendal block, which is only effective during the expulsion period and therefore completes the analgesia provided by the paracervical block), inhalatory and locoregional (spinal anaesthesia is a locoregional anaesthesia technique consisting of injecting an anaesthetic solution into the cerebrospinal fluid through an intervertebral space of the lumbar spine, in contact with the last medullary nerve roots. Finally, epidural anaesthesia (EA) is a technique of locoregional anaesthesia consisting of introducing a catheter into the epidural space allowing the diffusion of an active product) [5]. In France, the practice of PDA under epidural analgesia (EA) is constantly increasing, from 66.5% in 1998, 74.9% in 2003 to 81.4% in 2016 [6]. The Canadian study conducted by *Koteles et al.* in October 2012 reported a rate of delivery under epidural analgesia of 57.3% [7]. Furthermore, the use of ODA is rare in Africa. In Nigeria, *Imarengiaye et al.* in 2013 described a frequency of vaginal

delivery under APD of 1.3%. [8]. In Cameroon, the state of the subject is not fully explored and it is important to complete the database in the field of obstetrical analgesia by studying the experience of analgesia during labour.

## 2. Methodology

This was an analytical cross-sectional study carried out in the maternity wards of the Yaoundé Gynaecological-Obstetric and Paediatric Hospital (YGOPH), the Yaoundé Central Hospital (YCH), and the Douala General Hospital (DHG). These are reference teaching hospitals in Cameroon and thus offer the possibility of performing vaginal delivery under obstetric analgesia. The study took place from <sup>1</sup>December 2019 to 31 March 2020. We included all women who delivered vaginally, were conscious, and gave informed consent, and were divided into two groups: women who received epidural analgesia (subjects); and those who did not receive analgesia (controls).

After obtaining permission from the administrative department of YGOPH, YCH, and DGH, personal data were recorded using a pre-established and confidential questionnaire. The information form was explained and given to each parturient in the labour room for informed consent.

Participation in the study was voluntary. Consent was free and informed, written or verbal. Ethical clearance was obtained from the institutional ethics committee of the University of Yaoundé I as well as administrative authorisations from the three health facilities.

For each parturient, we sought information on the socio-demographic profile, the assessment of pain using the visual analogue scale, and the parturient's feelings after delivery.

Statistical analysis was carried out using Epi Info 7 version 7.1.3.3 and Excel 2013. The comparison of qualitative data was done by the Chi<sup>2</sup> test and the Fischer test. A value of  $P < 0.05$  was considered statistically significant. We compared sociodemographic and clinical data and pain intensity assessment between the two groups

## 3. Results

During our study, 127 parturients were approached but 13 refused to participate in the study. In the end, we retained 114 parturients, *i.e.* 35 (30.7%) parturients who gave birth under EA (exposed) and 79 others who gave birth without analgesia (unexposed).

### 3.1. Socio-Economic Data of Parturients

Exposed parturients were statistically older than unexposed ones (33.6 years  $\pm$  4.1 versus 29.5 years  $\pm$  3.6). Parturients aged 30 - 35 years were most likely to use analgesia ( $P = 0.04$ ) (Table 1).

The majority of parturients were also married ( $P = 0.12$ ) mostly coming from the coastal region ( $P = 0.0004$ ) (Table 1).

**Table 1.** Socio-economic data of parturients.

Socio-economic data	With analgesia N = 35(%)	Without analgesia N = 79(%)	RR (95% CI)	P-value
<b>Age</b>				
<25	0 (0.00)	5 (6.33)	-	0.12
[25 - 30[	5 (14.29)	39 (49.37)	0.26 (0.11 - 0.63)	0.0004
[30 - 35[	18 (51.43)	25 (31.65)	1.74 (1.01 - 3.01)	0.04
[35 - 40[	10 (28.57)	10 (12.66)	1.88 (1.08 - 3.26)	0.03
[40 - 45[	2 (5.71)	0 (0.00)	3.39 (2.54 - 4.52)	0.03
<b>Marital status</b>				
Single	13 (37.1)	20 (25.3)	1.45 (0.83 - 2.52)	0.19
Married	22 (62.9)	38 (48.1)	1.52 (0.85 - 2.71)	0.14
In a common-law relationship (cohabitation)	0 (0.0)	21 (26.6)	-	0.0007
<b>Region of origin</b>				
Centre	8 (22.9)	26 (32.9)	0.74 (0.37 - 1.46)	0.37
East	1 (2.9)	2 (2.5)	1.08 (0.21 - 5.52)	0.92
Far North	0 (0.0)	6 (7.6)	-	0.09
Coastal	9 (25.7)	3 (3.8)	2.94 (1.84 - 4.68)	0.0004
North	0 (0.0)	3 (3.8)	-	0.24
Northwest	0 (0.0)	3 (3.8)	-	0.24
West	15 (42.9)	26 (32.9)	1.33 (0.77 - 2.31)	0.30
South	1 (2.9)	9 (11.4)	0.30 (0.04 - 2.001)	0.13
Southwest	1 (2.9)	1 (1.3)	1.64 (0.40 - 6.77)	0.55
<b>Level of study</b>				
Secondary	0 (0.0)	5 (6.3)	-	0.12
Superior	35 (100.0)	74 (93.7)	-	0.12
<b>Religion</b>				
Catholic	21 (60.0)	40 (50.6)	1.30 (0.73 - 2.29)	0.35
Protestant	12 (34.3)	26 (32.9)	1.04 (0.58 - 1.86)	0.88
Muslim woman	0 (0.0)	9 (11.4)	-	0.03
Pentecostal	2 (5.7)	4 (5.1)	1.09 (0.33 - 3.50)	0.88
<b>Profession</b>				
Housekeeper	1 (2.9)	36 (45.6)	0.06 (0.008 - 0.43)	<0.0001
Informal sector	3 (8.6)	21 (26.6)	0.35 (0.11 - 1.05)	0.02
Public sector employee	13 (37.1)	10 (12.7)	2.33 (1.40 - 3.89)	0.002
Private sector employee	17 (48.6)	6 (7.6)	3.73 (2.31 - 6.03)	<0.0001
Student	1 (2.9)	6 (7.6)	0.44 (0.07 - 2.82)	0.33

**Continued**

<b>Monthly income (FCFA)</b>				
Less than 50,000	0 (0.0)	40 (50.6)	-	<0.0001
Between 50,000 and 100,000	2 (5.7)	22 (27.9)	0.22 (0.05 - 0.88)	0.007
Between 150,001 and 200,000	5 (14.3)	7 (8.89)	1.41 (0.67 - 2.95)	0.38
More than 200,000	28 (80.0)	10 (12.7)	8 (3.85 - 16.62)	<0.0001

  

<b>Socio-economic and clinical data</b>	<b>OR (Adjusted)</b>	<b>P-value (adjusted)</b>
Age range (years): <30	0.13 (0.04 - 0.37)	0.0002
Age range (years): ≥30	7.54 (2.65 - 21.45)	0.0002
Region of origin: Coastal	8.76 (2.20 - 34.87)	0.002

In the same vein, the use of analgesia was more frequent among parturients whose minimum monthly income was 200,000 FCFA ( $P < 0.0001$ ) (**Table 1**).

### 3.2. Data on Analgesia

#### Drug administration

The only anaesthetic used was bupivacaine (35/35; 100%), mostly combined with fentanyl (32/33; 96.2%). It was often administered by an electric syringe (24/35; 68.6%) (**Table 2**).

#### Analgesia technique used

The local anaesthetic used was bupivacaine with fentanyl as the main adjuvant in 96.9% of cases (**Table 2**).

### 3.3. Pain Assessment and Effects of Analgesia in Parturients

The pain experienced by the parturients was more intense under analgesia in the VAS during the active phase of labour (9 versus 9,  $P < 0.0001$ ), during expulsion (1 versus 6;  $P < 0.001$ ) and even at the 6th-hour postpartum (1 versus 1;  $P < 0.004$ ) (**Table 3**).

### 3.4. Evolution of the work

The majority of patients (14/35; 40%) delivered within the first 3 hours. And these were less likely to have pain, on the other hand, parturients under analgesia were five times more likely to have paresthesias ( $P = 0.004$ ; 95% CI = 1.85 - 18.99; RR = 5.92) and three times more likely to have prolonged second stage labour ( $P = 0.006$ ; 95% CI = 1.43 - 9.31; RR = 3.65) (**Table 4**).

### 3.5. Factors Associated with the Use of Analgesia for Childbirth

Factors associated with the use of analgesia during childbirth were: having an age greater than 30 years (OR = 7.54, 95% CI = 2.65 - 21.45;  $P = 0.0002$ ) being from the Littoral region (OR = 8.76, 95% CI = 2.20 - 34.87;  $P = 0.002$ ), working in a private setting (OR = 11.49, 95% CI = 3.96 - 33.30;  $P < 0.0001$ ) and having

**Table 2.** Distribution of parturients according to local anaesthetic, nature of adjuvant used, duration of labour after addition of analgesia and mode of administration.

Methods of administration	Numbers (N = 35)	Percentages (%)
<b>Local anaesthetics</b>		
Bupivacaine	35	100.0
<b>Adjuvant used?</b>		
Yes	33	94.2
No	2	5.7
<b>Nature of the adjuvant used</b>		
	N = 33	
Fentanyl	32	96.9
Morphine	1	3.0
<b>Time from onset of analgesia to delivery (in hours)</b>		
	N = 35	
[1 - 3[	14	40.0
[3 - 5[	12	34.3
[5 - 6[	9	25.7
<b>Method of administration</b>		
	N = 35	
Electric syringe	24	68.6
Bolus	11	31.4

**Table 3.** Distribution of parturients according to the intensity of labour pain.

Pain assessment (according to VAS)	Delivery under analgesia N = 35 (mean ± SD)	Delivery without analgesia N = 79 (mean ± SD)	p-value
Before the start of the active phase	8.6 ± 0.7	8.7 ± 1.0	0.368
Active phase	1.2 ± 0.9	9.2 ± 0.6	<0.0001
During the eviction	1.6 ± 1.0	5.4 ± 0.9	<0.001
At the 6th hour post partum	1.5 ± 0.7	1.9 ± 0.7	0.004

**Table 4.** Distribution of parturients according to effects following the 2nd stage of labour.

		Delivery under analgesia		RR [95% CI]	p-value
		Yes N = 35; n (%)	No N = 79; n (%)		
<b>No complaints</b>	Yes	15 (42.9)	2 (2.5)	28.90 [6.10 - 136.80]	<0.001
	No	20 (57.1)	77 (97.5)		
<b>Pain</b>	Yes	1 (2.9)	76 (96.2)	0.001 [0.00 - 0.001]	<0.001
	No	34 (97.1)	3 (3.8)		
<b>Paresthesias</b>	Yes	10 (28.6)	5 (6.3)	5.92 [1.85 - 18.99]	0.002
	No	25 (71.4)	74 (93.7)		

## Continued

<b>Extension of the expulsion phase</b>	Yes	13 (37.1)	11 (13.9)	3.65 [1.43 - 9.31]	0.004
	No	22 (62.9)	68 (86.1)		
<b>Dizziness</b>	Yes	3 (8.6)	15 (19.0)	0.40 [0.11 - 1.48]	0.128
	No	32 (91.4)	64 (81.0)		
<b>Itching</b>	Yes	1 (2.9)	3 (3.8)	0.75 [0.08 - 7.42]	0.640
	No	34 (97.1)	76 (96.2)		

an income of more than 200,000 CFA francs (OR = 60.17, 95% CI = 13.09 - 276.46; P < 0.0001) (Table 5).

## 4. Discussion

### 4.1. Frequency of Use of Analgesia during Labour

During our study, 35 parturients benefited from analgesia delivery out of a total population of 114 parturients, a frequency of 30.7%; this is lower than a study conducted by *Koteles et al.* in October 2012 in Canada where the rate of use of epidural analgesia was 57.3% in women who had a vaginal delivery [7]. This low rate could be explained by the fact that parturients in our African context wish to respect their cultural beliefs (58.2%) and have a less medicalised delivery (59.5%). This rate is however higher than that found by *Imarengiaye et al.* in a study conducted in September 2013 in a tertiary hospital in Nigeria, where the rate of use of epidural analgesia during labour during the study period was 1.3% [8]. This increase is thought to be partly due to the lack of information about the possibility of pain-free delivery, the lack of trained staff, and even infrastructure in these tertiary hospitals.

### 4.2. Socio-Demographic Profile of Parturients

The mean ages were  $33.6 \pm 4.1$  years for parturients who used analgesia during labour and  $29.5 \pm 3.6$  years for parturients who did not receive analgesia during labour. Parturients aged 30 - 40 years were twice as likely to use analgesia during labour.

Parturients employed in the public and private sectors were respectively 2 to 3 times and 3 to 4 times more likely to use analgesia during labour. The same was true for parturients with a minimum monthly income of 200,000 FCFA, who were 8 times more likely to use analgesia. A similar finding was made in a study carried out in Canada in 2012 by *Koteles et al.* on the maternal characteristics and satisfaction associated with the use of intrapartum epidural analgesia in Canadian women, where he found that women who had recourse to epidural analgesia were twice as likely to have a high salary [7]. This can be explained by the fact that giving birth under epidural analgesia is expensive in our hospitals and therefore not affordable for people with a low standard of living.

**Table 5.** Multivariate analysis (profile of parturients seeking obstetric analgesia).

<b>Level of study: higher</b>	1.11 (0.30 - 4.04)	0.97
<b>Muslim religion</b>	-	0.95
<b>Profession of housewife</b>	0.03 (0.004 - 0.26)	0.001
<b>Informal sector employee</b>	0.25 (0.07 - 0.93)	0.03
<b>Public sector profession</b>	4.07 (1.57 - 10.58)	0.003
<b>Private sector occupation</b>	11.49 (3.96 - 33.30)	<0.0001
<b>Monthly income (FCFA): Less than 100,000</b>	0.01 (0.003 - 0.07)	<0.0001
<b>Monthly income (FCFA): ≥200,000</b>	60.17 (13.09 - 276.46)	<0.0001
<b>Gestité ≥ 4</b>	4.86 (1.60 - 14.75)	0.005

### 4.3. Analgesia Technique Used during Labour

Throughout our study, the only analgesia technique observed to relieve the pain of labour was delivery under epidural analgesia (100%) with bupivacaine as the local anaesthetic used; The majority of anaesthetists (98%) recommended, in accordance with the literature, the use of epidural analgesia during labour [9] [10] [11].

Similarly a study by *Lavand et al.* in 2009 in Belgium on patient-controlled intravenous analgesia as an alternative to epidural analgesia during labour: Questioning the use of the short-acting opioid remifentanyl in the French part of Belgium where delivery under epidural analgesia was found in 68%. When epidural analgesia was not available or contraindicated, parenteral opioid administration (tramadol or pethidine) was proposed in 19% (7/36) of hospitals, then a third choice was the use of entonox to relieve labour pain in 11%, a pudendal block by obstetricians in 28% of hospitals and non-pharmaceutical alternatives (*i.e.* hypnosis, relaxation therapy, baths, and massage) in 19% [12].

Finally, a study conducted by *Pottecher et al.* in France in 2012 aimed to provide an overview of the mechanisms and pathways of labour pain (including new knowledge on the integration of the nociceptive signal) and highlight the need for effective labour pain relief found that among the current methods of obstetric analgesia, regional analgesia (the most common technique being epidural analgesia) offers the best efficacy/safety ratio due to pharmacological innovations. Systemic analgesia (parenteral opioids, non-opioid analgesics, and inhaled anaesthetic agents) offers an alternative to regional analgesia but remains less effective and more dangerous. Non-drug approaches (*i.e.* psycho prophylaxis and physical methods) can be effective when used with epidural analgesia but are often not powerful enough when used alone [13]. Our results could be explained by the fact that epidural analgesia confers more advantages because the equipment needed to perform it is available, less expensive, consciousness is maintained and there are few side effects.



#### 4.4. Assessment of Pain and Effects of Analgesia in Recruited Parturients

##### 4.4.1. Assessment of Pain

Regarding pain during delivery, parturients delivering under analgesia had significantly less pain (VAS of  $1.6 \pm 1.0$ ) than those not using analgesia for delivery (VAS of  $5.4 \pm 0.9$ ). This observed difference was statistically significant ( $P < 0.001$ ). This could be explained by the fact that prior to the use of analgesia, when the patient is in the latent phase of labour, there is an increase in pain intensity due to the elevation of uterine contractions and the cervix corresponding to the nerve endings of the T5-T12 nerve roots in the spinal cord, then associated with the T10-L1 nerve roots to arrive at the S2 to S4 roots at expulsion [9]. When analgesia is introduced during labour, there is a decrease in pain intensity and even after the technique, which is explained by the use of bupivacaine, which is a powerful local anaesthetic that acts by blocking sodium channel nerve conduction, thus inhibiting the sensitive function of the T5-S2 nerve roots.

##### 4.4.2. Effects of Analgesia in Recruited Parturients

Parturients who gave birth under analgesia were 5.9 times more likely to have paresthesias during labour ( $P = 0.002$ ). The same is true for prolongation of the expulsion phase of labour for which parturients under analgesia had 3.6 times more risk ( $P = 0.004$ ); the latter may be comparable to that found by *Imarengiaye et al.* in a study conducted in September 2013 in a tertiary hospital in Nigeria where women who gave birth under epidural analgesia had 4.2 times more risk of having a prolongation of the second stage of labour [8]. This could be explained by the fact that the presence of epidural analgesia leads firstly to a decrease in the pushing reflex with a decrease in oxytocin secretion making uterine contractions less effective; Secondly, epidural analgesia also leads to a relaxation of the perineal muscles and in particular the levator ani muscles, with intra-pelvic rotation of the fetal mobile, at a lower level in the pelvic excavation, or even a backward rotation with a release in the occipito-sacral variety; Finally, it causes a reduction in the efficiency of the pushing efforts by a reduction in the pushing reflex [12].

In contrast, a study conducted by *Kannan et al.* in 2001 to examine how epidural analgesia for labour influences maternal satisfaction in women who initially choose natural childbirth found that women who requested epidural analgesia for pain in labour reported significantly lower pain scores than women who chose natural childbirth. However, 88% of women who requested an epidural for pain reported being less satisfied with their delivery than those who did not, despite less pain. Parturients' main concerns about epidurals and their effect were greater than expected pain during labour, perceived failure to request an epidural, and longer labour [10].

#### 4.5. Suggested Analgesia for Labour by Midwives

During the entire recruitment period in the maternity wards of the Yaoundé

Gynaecological-Obstetric Hospital, Yaoundé Central Hospital, and Douala General Hospital, we found that only 6.3% of parturients were given a suggestion by the midwives to better cope with the pain of labour in the labour ward. This is lower than the rate found by *Lawani and Nigeria* in 2012 who conducted a study on the recommendation of analgesia during labour in Nigeria where 49% of obstetricians offered obstetric analgesia. Only 13.3% routinely offered obstetric analgesia to parturients [14]. This low rate could be explained by the fact that our midwives sometimes have little knowledge about the practice of obstetric analgesia and also fear a prolongation of the duration of labour that could extend the hours of monitoring the parturient.

## 5. Conclusion

Delivery under analgesia is still not widely practised in sub-Saharan Africa. Overall, delivery under epidural analgesia offered a better experience of childbirth and satisfaction with the delivery process.

## Conflicts of Interest

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

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