

# Obstetrical Vacuum Deliveries: Clinical Aspects and Fetal Prognosis in Regional Teaching Hospital of Ouahigouya

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## Abstract

**Objective:** To determine the frequency of obstetrical vacuum deliveries in the service of obstetrics and gynecology of regional teaching hospital of Ouahigouya and then to assess fetal outcomes. **Patients and Methods:** It was about a cross sectional and descriptive retrospective data collection from 1<sup>st</sup> January 2014 to 31<sup>st</sup> December 2016 in the service of obstetrics and gynecology of regional teaching hospital of Ouahigouya. Patients who had vacuum delivered in the service with single pregnancy, at least 34 weeks gestation age and summit presentation and had a useful medical folder were included in our study. The data were collected and the analysis used epi-info software 7.2.1.0. version, 2010 Word and excel. The results were presented in percentage for qualitative variables and in means standard deviation for quantitative variables. **Results:** We have collected 6233 deliveries from 1<sup>st</sup> January 2014 to 31<sup>st</sup> December 2016, out of which 312 were done by using obstetrical vacuum giving a frequency of 5.0%. The mean age of patients was  $23.5 \pm 6.4$  years. The average parity was  $1.3 \pm 0.7$  women per delivery and 73.1% of our patients were pauciparous. 90.1% of patients were referred. The main indications were maternal weakness (43%), fetal distress (36.5%), prolonged expulsive phase (6.1%), stopping progression (4.8%) and the scar uterus (4.5%). Fetal prognosis was dominated by the caput in 13 cases (4.2%) and excoriations of the scalp in 5 cases (1.7%). **Conclusion:** Vacuum extractions are very limited in low setting countries. Its popularization is essential to reduce maternal and fetal mortality.

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## Keywords

Obstetrical Vacuum, Frequency, Indications, Fetal Prognosis

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### 1. Introduction

Instrumental extraction is a vaginal delivery assistance using an adapted tool: vacuum, Forceps or spatula. Vacuum is an extraction appliance, the most used in Africa and Asia [1]. The rates of deliveries by vacuum use vary from 2% to 10% [2]. Hospital studies show rates low than 2% [3] [4] [5] [6].

In Burkina Faso, in 2010, an assessment of emergency obstetrical care providing had concluded that vacuum extractions were not widely used [7].

Our study would help to appreciate the advantage of this instrument in the maternity of the Regional Teaching Hospital of Ouahigouya and its contribution of the quality in term of care of patients.

### 2. Patients and Methods

We conducted a cross-sectional study for descriptive purposes including a retrospective data collection from 1<sup>st</sup> January 2014 to 31<sup>st</sup> December 2016 in the service of obstetrics and gynecology of regional teaching hospital of Ouahigouya (RTHO).

The RTHO is the referral center of six sanitary districts of the North Region which are: Ouahigouya, Titao, Thiou, Seguenega, Gourcy and Yako. Its population zone of cover is estimated of 1.587.866 inhabitants in 2017 (General Census of Population and Housing 2006).

Were included in our study, all patients who have had a vacuum delivery in the service with single pregnancy at least 34 weeks gestation, with summit presentation and having a useful medical folder.

Have not been included women who have had a vacuum delivery and having an unusable medical folder.

Variables used were socio-demographical characteristic (age, parity, living place), clinical characteristic (mode of admission, gestational age, fetal heart rate, amniotic liquor aspect, status pelvis, level of engagement of presentation), Indications of vacuum use and fetal outcomes.

The collect of data were done using a questionnaire pre-tested. It included patient identity, clinical characteristics, procedure of the use of vacuum and maternal and neonatal outcomes.

The data were collected and analysis using epi-info software 7.2.1.0. version 2010 Word and Excel. The results were presented in percentage for qualitative variables and in means standard deviation for quantitative variables.

### 3. Ethics Approval

This study was conducted under the supervision of THE UNIVERSITY OUAGA I

PROFESSOR JOSEPH ZERBO KY, medical school. We obtained the approval of the Medical Establishment Commission of regional teaching hospital of Ouahigouya which acts as an ethics committee at the local level. Confidentiality of individual data was ensured at all stages of the study, during the collection and analysis of data through the use of individual and anonymous data collection forms.

## 4. Results

### 4.1. Frequency

We have collected 6233 deliveries during the period of study, out of which 312 have needed obstetrical vacuum use giving a frequency of 5.0%; 1863 Caesarean-sections (29.9%) and 4058 (65.1%) vaginal deliveries.

### 4.2. Sociodemographical Variables

The mean age of patients was  $23.5 \pm 6.4$  with range of 14 and 40 years; 115 parturiantes (36.9%) were less than 20 years. The mean parity was  $1.3 \pm 0.7$  and the highest one was 9; the nulliparous women were 182 (58.3%). The women without non-salary occupation (housewives and pupils) represented 90.1% (281); 203 (97.1%) were married or cohabitation status. The refereed patients were 220 (70.5%).

### 4.3. Clinical Variables

#### -Gestational age

Patients whose term was greater than or equal to 37 weeks of amenorrhea were three hundred six (309) or 99% and 3 patients, or 1% had a term is between 34 and 37 weeks of amenorrhea.

#### -Fetal heart rate

Before the application of the Obstetric vacuum, 265 patients, or 85.5% had a fetal heart rate between 120 and 160 beats/minute; 19 patients, 6.1%, had a fetal heart rate of less than 120 beats/minute; 13 patients, 4.2%, had a fetal heart rate greater than or equal to 160 beats/minute. Fetal heart rate was not seen at obstetrical stethoscope of Pinard in 13 patients, 4.2% of cases.

#### -Amniotic liquor aspect

According to the aspect of amniotic fluid, in 177 patients (56.7%) it was clear liquor, in 64 cases (20.5%) it was meconium stained liquor patients and 3 patients (1%) had mash pea liquor.

#### -Pelvic status

The internal pelvimetry revealed that 300 parturients, 96.2% had a clinically normal pelvis, 8, 2.5% had a limited pelvis and 4, 1.3% and asymmetric pelvis.

#### -Level of presentation

The obstetrical vacuum was applied to the lower strait in 72.1%.

The level of the descent of the presentation was not appreciated in 69 cases (**Table 1**).

#### -Indications of obstetrical vacuum

The indication of the suction cup was not specified in 19 cases (**Table 2**).

#### 4.4. Neonatal prognosis

##### - Status of Newborns at birth

The use of obstetrical vacuum has allowed getting 286 alive newborns, 91.7%. The distribution of the status of newborns is presented in **Table 3**.

##### - Neonatal complications

In our study, 18 neonates had a complication at a frequency of 5.9%. The neonatal complications observed were caput in 13 cases (4.2%) and excoriations of the scalp in 5 cases (1.7%).

**Table 1.** Distribution of patients by level of presentation of the fetal head (n = 243).

level of presentation	Absolute value	Percentage (%)
Lower strait	225	92.6
Mean strait	16	6.6
Higher strait	2	0.8
Total	243	100

**Table 2.** Distribution of the patients according to the indications of obstetrical vacuum use (n = 293).

Indications of obstetrical vacuum use	Number	Percentage (%)
Maternal weakness	126	43
Fetal distress	107	36.5
Prolonged second stage of labor	18	6.1
Non progress of fetal head	14	4.8
One previous uterine scar	13	4.5
Maternal disease	8	2.7
Refusal to push	7	2.4
Total	293	100

**Table 3.** Distribution of parturients according to the condition of the newborn at birth.

Parameters of newborns		Number	Percentage (%)
Alive	Not resuscitated	204	65.4
	Resuscitated	82	26.3
	Still birth	26	8.3
APGAR score less than 7 at 1 <sup>st</sup> minute		114	36.5
APGAR score less than 7 at 5 <sup>th</sup> minute		69	22.1
APGAR score $\geq$ 7 at the 5 <sup>th</sup> min		247	77.9

## 5. Discussion

### 5.1. Limitations and Constraints

This study was conducted in the service of obstetrics and gynecology of regional teaching hospital of Ouahigouya.

- The fact that it is retrospective study has led to limitations by:
- The loss of some of clinical folders;
- The insufficiency of information in some of clinical folders;
- The non-full complete information of important items in some of clinical folder like level of education, the data of anthropometric parameters.

### 5.2. Frequency

The rate of extraction is 5.01% in our study. It is comparable to those of Raynal P, *et al.* in French Guyane [8], of Dupuis O *et al.* [9] in France and Boni S *et al.* [10] in Ivory Coast who have found respectively 4.35%, 4.9% and 5.95%.

Our rate is higher very than to that observed by Mutombo K L; *et al.* in Congo [4], Randriambololona D M A. *et al.* in Madagascar, Cisse C T *et al.* in Senegal [3], Ouattara S *et al.* in Burkina Faso [11], Nolens B *et al.* in Ouganda [5] and Traore M *et al.* in Mali [12] who have found respectively 0.4%, 1.27%, 1.38%, 1.85%, 2.4% and 3.7%. Many reasons would explain that high rate of extraction by vacuum in our study: the obstetrical vacuum is used by midwives as well as doctors and the obstetrical vacuum is the only instrument available in our service unlike other authors who use forceps or spatula in addition to vacuum. Otherwise, once the indication of extraction is posed, the best instrument is the one to which the operator is most accustomed.

### 5.3. Indication of Vacuum Use

The main indications of the use of vacuum in our study were most represented by maternal weakness (43%), fetal distress (36.5%), prolonged expulsive phase (6.1%), stopping progression (4.8%) and the scar uterus (4.5%). Those indications are widely reported by many authors:

-Ouattara S *et al.* in Burkina Faso [11] has reported 46.72%, 24.29% and 8% respectively for poor expulsive efforts, maternal weakness and fetal distress.

-Traore B *et al.* in Mali [13] has found 10.3% for poor expulsive efforts and 5.7% for fetal distress.

-Cisse C T *et al.* in Senegal [3] has reported: 32.9% for maternal weakness, 24.9% for uterine scar and 21.4% for fetal distress.

Grisot C [14], in a comparative study of the perineal morbidity of extractions by spatulas and by vacuum, found for its part a predominance of the indications for insufficient expulsive efforts and acute fetal distress respectively in the proportions 44.8% and 53.7%.

While other author have found that fetal distress was the first indication of vacuum use [15] [16] [17].

## 5.4. Fetal Prognosis

In our series, most of newborns were alive (91.7%) versus 8.3% of fresh still birth.

At the first minute, the Apgar score was less than 7 in 36.50% of babies versus 22.1% at the fifth minute.

Neonatal deaths rate in our study was high compared to what is reported in literature. Indeed, Ouattara S *et al.* in Burkina Faso [11], Randriambololona DMA *et al.* in Madagascar [6] and Cisse C T *et al.* in Senegal [3] have reported respectively 1.87%, 4.38% and 6%.

Our rate is certainly biased because of pre-existing fetal over-morbidity: hypoxia or infection. Obstetrical vacuum may add its own complications. In that situation, instrumental extraction is often carried out in order to hasten the exit of the fetus from an harmful environment which is no longer profitable for him and for which a caesarean decision would be taken too late because there would be a risk of imminent perinatal death.

Regarding to the neonatal morbidity aspects we have observed 5.9% of complications. The main complication were caput succedaneum (4.2%) and head excoriations (1.7%). There was no case of major complications like fractures of the skull, intra skull hemorrhage and skull-hematoma.

Because instrumental extractions are used to manage dystocia cases, they are associated with a higher rate of neonatal lesions than spontaneous low births. Indeed, according to the literature, neonatal morbidity after extraction by vacuum is stable. Nevertheless, the frequency of the different types of complications varies according to the authors [3] [6] [11] [18] [19] [20].

By cons, Baume S. in France [21], had found 8.2% cephalhematoma, but that term was attributed improperly to pathology observed in the delivery room a few hours after birth or in the first review of the infant to day1. Moreover, it was no longer mentioned in the review of output day5, which we can assume that they were caput succedaneum early onset and disappearing in a few days.

## 6. Conclusion

Well used, the obstetrical vacuum remains a saving instrument. This requires a strict observance of the indications and a perfect knowledge of obstetrical mechanics. Large-scale mastery and extension could not only reduce the number of obstetric emergencies evacuations to referral centers, but also the number of abusive caesarean sections.

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