

# Is there Still a Place for Vacuum Extraction (Ventouse) in Modern Obstetric Practice in Nigeria

Okeke TC, Ekwuazi KE

Department of Obstetrics and Gynecology, University of Nigeria Teaching Hospital, Enugu, Nigeria

## Address for correspondence:

Dr. Tochukwu Christopher Okeke,  
Department of Obstetrics and  
Gynecology, University of Nigeria  
Teaching Hospital, Enugu, Nigeria.  
E-mail: ubabiketochukwu@yahoo.  
com

## Abstract

There has been a decline in operative vaginal delivery world-wide. Vacuum extraction has largely replaced forceps delivery in our low resource setting and in the developed countries, but the teaching and exposure of this procedure is still on the decline. There is a need for enhanced teaching and exposure of operative vaginal delivery and mastering of the procedure in our centers by the residents in training. Review of the pertinent literature and studies on operative vaginal delivery, selected references, internet services on operative vaginal delivery. Earlier studies on operative vaginal delivery showed that vacuum extraction has been the procedure of choice. The rates reported from developed countries were much higher than the rates reported from Nigeria. Vacuum extraction rates of 1.5% from Zaria, 1.7% from Maiduguri, 1.6% from Ilorin and 3.5% from Benin City all in Nigeria. At the University of Nigeria Teaching Hospital, Enugu-Nigeria, ventouse is popular with rates of 3.1% in 1980, 3.5% in 2001, and 1.5% in 2006, but still on the decline. Vacuum extraction is safe and effective practice in our poor resource setting. There is a need for enhanced teaching and exposure of residents in training because widely divergent situation can exist; facilities and adequate back up for caesarean section may not always be available in our poor resource setting.

**Keywords:** Forceps, Nigeria, Operative vaginal delivery, Vacuum extraction (ventouse)

## Introduction

World-wide, vacuum extraction (ventouse) remains an integral part of the obstetrician's duties.<sup>[1]</sup> Current obstetric practice employs instrumental vaginal delivery techniques and various other interventions to achieve the best possible outcomes in cases of poor labor progress, maternal exhaustion, presumed fetal jeopardy, medical conditions that require shortening of 2<sup>nd</sup> stage of labor and other common clinical problems.<sup>[2]</sup> Thus, instrumental vaginal delivery is a key element of essential care, improving its use in resource poor countries through training and supply of appropriate equipment is likely to contribute significantly to reduce maternal and newborn morbidity/mortality.<sup>[3]</sup> Vacuum extraction is an alternative to forceps delivery. Forceps and vacuum extraction are the most popular of the operative vaginal procedures with

comprehensive documentation of their development, use and complications in obstetric practice and medical media.<sup>[3]</sup> However, these procedures are underutilized in Nigeria and in most low resource settings. It is important to note that vaginal instrumental delivery is a service provided and accepted world-wide in both basic and comprehensive essential (or emergency) obstetric care (EOC).<sup>[3]</sup> Vacuum extraction plays important complementary roles to forceps delivery and remains an appropriate tool in the armamentarium of the modern obstetric practitioner.<sup>[2]</sup>

The first attempted vaginal delivery using a cupping glass was carried by Yonge in 1705. In 1848, a bell-shaped device called an "air tractor vacuum extractor" was devised by the developer of the Simpson forceps. Series of innovations followed until 1953 when Malmstrom developed a metal-cup extractor. Recently, bell-shaped and hemispheric silicone rubber cups have been in use in modern obstetrics.<sup>[4]</sup> It is designed as an integrated unit for complete control without an assistant. The soft cups seem to be appropriate for straightforward deliveries.<sup>[5]</sup>

Currently, about 4-13% of maternal deaths in Africa, Asia, Latin America and the Caribbean are caused by complications of prolonged and obstructed labor.<sup>[6]</sup> In spite of numerous

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evidence-based interventions known to prevent most of these associated maternal deaths such as instrumental vaginal delivery, labor augmentation, caesarean section, external cephalic version, partogram, episiotomy, symphysiotomy, and destructive operations for the nonviable fetuses.<sup>[7,8]</sup> These evidence-based interventions are currently underused in low resource settings.<sup>[3]</sup>

## Methods of Literature Search

A systematic search of literature on instrumental vaginal delivery published in English was conducted. Relevant materials on ventouse (vacuum extraction) and forceps delivery were selected. Selected references, conference papers, technical reports, journal articles, abstracts, relevant books, lecture notes and internet articles using Medline, Google scholar and Pubmed databases were critically reviewed.

Vacuum extraction is a safe and effective practice in achieving the obstetric care of a healthy mother and baby. Such safe operative vaginal delivery is most crucial in the African poor resource setting,<sup>[9]</sup> where there is much aversion for caesarean delivery and caesarean section is perceived as a reproductive failure.<sup>[10]</sup> In Nigeria, our women are averse to caesarean section and most centers do not have adequate facilities for the surgery yet use of vacuum extraction is still very low. In our environment, after caesarean section, the patient may not report again to the hospital for subsequent deliveries for various reasons including the fear that she may undergo another caesarean section.<sup>[9]</sup> These patients are at risk of uterine rupture with its poor outcome.<sup>[9]</sup>

A recent study that examined national attitudes towards ventouse in 121 developing countries, found that the use of ventouse was not universal.<sup>[11]</sup> Rates in sub-Saharan Africa and Asia were higher than the rates in Latin America and the Caribbean. The reported findings were routinely used in 48% of the countries studied, 17% of the countries never used or taught vacuum extraction and 37% restricted its use to specialists. However, Bailey in 2005, documented low rates of instrumental vaginal delivery (5% or less) from West Africa and Latin America.<sup>[12]</sup> In countries where instrumental vaginal delivery is used in the developing countries, vacuum extraction is popular in Africa and Asia while forceps are popular in Eastern Europe and South America.<sup>[13]</sup>

The frequency of vacuum extraction to assist vaginal delivery varies greatly from country to country and within country, varies from one obstetric unit to another.<sup>[2]</sup> The ideal rate is unknown, about 10-15% in the UK<sup>[14]</sup> 4.5% in the USA.<sup>[15]</sup> Rates of less than 1% are reported from sub-Saharan Africa.<sup>[12]</sup> The discrepant rates may be related to differing managements of labor.<sup>[11]</sup> Vacuum extraction has largely replaced forceps delivery in most developing countries, and in many countries in Northern Europe.<sup>[2,16]</sup> The popularity of vacuum extraction in the developing world may be partly due to the advantages

vacuum extraction has over forceps, such as its high success rate in 2<sup>nd</sup> stage of labor and consequent reduction in caesarean section rates,<sup>[17]</sup> it encourages autorotation in malposition of the head, the ease of mastery by residents in training, requires less skill, and exposure, anesthesia is not a pre-requisite and its safety for both mother and fetus.<sup>[2,16,17]</sup> A recent Cochrane review<sup>[5]</sup> found that the risks and benefits of the two forms of instrumental vaginal delivery are comparable. Often, the delivery instrument is selected based on the training and experience of the obstetrician as well as the indication for the procedure. Incorrect technique and deficient exposure contribute to increased complications of instrumental vaginal delivery.<sup>[18]</sup>

The safe use of vacuum extraction requires strict adherence to guidelines and prerequisites for the operation, good case selection, and judgment, adequate skill, and experience, mastery of the equipment, and limitation of oneself to simpler procedures.<sup>[9,17]</sup>

Contraindications to vacuum extraction procedure include, operator inexperience, inability to access fetal position (unengaged head), non-cephalic presentation (breech, face, brow, or shoulder), fetal coagulopathy, suspicion of cephalopelvic disproportion and fetal prematurity (<34 weeks).<sup>[2]</sup> The maternal/perinatal morbidities associated with the use of ventouse are indications that it is unsafe in untrained hands. However, the use of silastic rubber cups help in reduction of these associated complications which is more pronounced with the use of metal cups.

In the USA, ventouse is becoming increasingly popular<sup>[12]</sup> while in Europe, ventouse has long been the instrument of choice for assisted vaginal delivery.<sup>[18]</sup> Vacuum extraction rates of 1.6% from Ilorin, 1.7% from Maiduguri and 3.5% from Benin City all in Nigeria.<sup>[18]</sup> The rates reported from developed countries were much higher than the rates reported from Nigeria.<sup>[18]</sup> A 5-year review of births at the Ahmadu Bello University Teaching Hospital, Zaria revealed that of 6662 vaginal deliveries from 1997 to 2001, 3.9% were by operative vaginal delivery procedures. Forceps delivery rate was 2.2% while vacuum delivery rate was 1.5%.<sup>[19]</sup> At the University of Nigeria Teaching Hospital, Enugu, earlier studies on operative vaginal delivery showed that vacuum extraction has been the procedure of choice. Ventouse is popular with rates of 3.5%, 3.1%<sup>[17]</sup> and 1.5%,<sup>[20]</sup> but still on the decline. Currently, the use of forceps at the University of Nigeria Teaching Hospital, Enugu is rare. It is very clear that assisted vaginal delivery is one of the underutilized and least available EOC signal functions in resource poor countries.<sup>[8,21]</sup> Unmet training needs, lack of suitable equipment and human resource shortages are the reasons put forward for this.<sup>[11-13]</sup>

World-wide, there are conflicting reports on the trend in the general rate of instrumental vaginal delivery. Whereas a

decline is reported in the United States,<sup>[20]</sup> relatively constant rate is reported in some other parts of the world such as Australia and Scotland.<sup>[11]</sup> A recent survey, similarly, indicates that vacuum extractor has become the primary means to achieve operative vaginal delivery in the United States.<sup>[18]</sup> In the developing countries, the biggest task is the problem of lack of skilled operators. Staff shortages in operative vaginal delivery in developing countries are a major obstacle to the provision of good quality EOC.<sup>[22]</sup> There is need to train skilled birth attendants to conduct vacuum deliveries. There is also need for advocacy at professional associations and ministries of health on the safety and usefulness of vacuum extraction. High quality training is crucial.<sup>[3]</sup> Continuing medical education techniques, which are interactive (case discussion and hands-on practice sessions using models) and use of mixed educational sessions (obstetricians, midwives and skilled birth attendants) are beneficial and should be promoted for in-service training.<sup>[23,24]</sup>

There is a need to promote vacuum extraction and hence reduce caesarean section rates in our centers. In Nigeria caesarean section rates vary from 10% to 35%.<sup>[25]</sup> This rate is high in spite of the fact that our women have a negative attitude towards caesarean section<sup>[20]</sup> and facilities for it are inadequate or fragile.<sup>[15]</sup> This write up is intended to awake interest in the use of ventouse in our centers and more emphasis in the teaching and mastery of vacuum in the residency training since vacuum extraction is a procedure of interest in our African poor resource setting. There is a need to increase its use and perhaps contribute in reducing the currently high caesarean section rates in our centers.<sup>[25]</sup>

In conclusion, there is a definite role of vacuum extraction in Nigeria because of our poor resource setting, widely divergent situations can exist,<sup>[26]</sup> facilities for caesarean section may not always be available, caesarean section may pose a risk in a subsequent pregnancy possibly unsupervised labor and adequate back up facilities are not available.<sup>[26]</sup>

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