Introduction
INTRODUCTION

The journey of the human being to the moon may be safe but, the journey of a fetus only six inches through maternal pelvis, is not always safe. Obstetrical care providers face many dilemmas in the management of second stage complications. The decision requires experienced obstetrical skill to choose among vaginal, assisted vaginal or caesarean delivery for safe maternal and fetal outcome.

Difficult and traumatic vaginal deliveries have been largely replaced by the safer alternative of caesarean section resulting in the upsurge in the incidence of caesarean births to almost 20% (USA 24.7%, Australia 16.1%, UK 20-24%)\(^1\). Forceps and vacuum have both revolutionized the mode of delivery resulting in incidence ranging between 5-15% in clinical practice. Currently, the rate of instrumental vaginal delivery in USA is 20.0%. Australia 16.4%, India – Delhi 11.7%, Bombay 13.7%\(^2\).

The Chamberlen family invented the forceps 400 years ago. James Young in 1705, first used vacuum device. It was Malstrom, in 1954 who really introduced the idea of modern day vacuum extractor in practice.

The ACOG classifies instrumental delivery procedure according to fetal head station and cranial position as outlet, low, mid and high application. The two most common indications are fetal distress and non-progressive 2\(^{nd}\) stage. Over the years, there have been many modifications of both the instruments. The chances of failure are more
with soft cups than rigid cups as per the Cochrane Database of Systematic Reviews (2006)\textsuperscript{3} and a study by Attilakos G\textsuperscript{4}.

Many obstetricians now prefer to use vacuum because of its reputation for ease of use, lower maternal morbidity and safety and thus, replaced forceps in many situations. A successful assisted vaginal delivery avoids caesarean section, its attendant uterine scar and its implications for future pregnancy. Ventura et al (1997)\textsuperscript{5} reported that the rate of caesarean section in the United States had declined from 22.8\% in 1987 to 20.8\% in 1997. During the same period, the incidence of operative vaginal delivery increased marginally from 9.0 to 9.4\%. Boyd ME (1986)\textsuperscript{6} and Revah et al (1997)\textsuperscript{7} suggested that the obstetric outcome was not worsened by a trial of operative vaginal delivery.

We therefore, must revive back the forgotten art of instrumental vaginal deliveries and must judiciously apply the art of application of instruments for the always critical 2\textsuperscript{nd} stage of labour, thereby reducing the caesarean section rate.

In our study, we assessed the advantages and disadvantages of the two methods in terms of maternal and fetal outcomes.
Aims

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Objectives
AIMS AND OBJECTIVES

1. To analyse instrumental vaginal delivery and to compare maternal morbidity by vacuum extractor with delivery assisted by forceps.

2. To compare neonatal outcomes in assisted vaginal delivery by ventouse with forceps application.

3. To enumerate the indications of vacuum assisted delivery in cases of full term pregnancy with cephalic presentation.
Material & Methods
MATERIAL AND METHODS

The present study was conducted in the Department of Obstetrics and Gynaecology, Pt. J.N.M. Medical College and Dr. B.R.A.M. Hospital Raipur, from Aug 2007 to Feb 2009 with main aim of comparing the maternal and fetal outcome of Vacuum vs Forceps delivery.

Inclusion criteria

Patients in labour delivered by assisted vaginal delivery with fullterm pregnancy with cephalic presentation.

Exclusion criteria

- Any presentation other than vertex (breech, face, brow)
- Preterm fetus <35 wks gestational age
- Suspected fetal coagulation disorder
- Suspected fetal macrosomia (>4 Kgs)
- High station (above 0)
- Inability to assess fetal position
- Infants with congenital malformations.

Detailed history was taken and obstetric examination done. Data on women giving birth by vacuum and forceps deliveries were analyzed and compared in terms of parity, gestational age, station of fetal head at the commencement of extraction, presentation, indications.

The various indications were fetal distress, non progressive 2nd stage of labour, to cut short 2nd stage of labour, inadequate expulsive efforts.

After patient selection, written and informed consent was taken. Prerequisites of instrument application were fulfilled like emptying of
bladder, adequate analgesia, good uterine contraction, ruptured membranes, engaged head, cervix at least 6cm dilated in ventouse and fully dilated in forceps delivery.

Sialistic cup was used in vacuum extraction. Forceps deliveries were performed using short curved outlet Wrigley's forceps. Vacuum extraction delivery was abandoned when there was no descent of the fetal head after traction, repeated cup detachments of >3, no delivery after four contractions and if the time limit exceeds 20 mins.

Maternal morbidity was analysed in terms of perineal, vaginal, cervical lacerations, episiotomy extension, urinary incontinence, traumatic postpartum haemorrhage, post partum pyrexia.

Neonatal complications in both groups including low Apgar score, unexplained convulsions, jaundice, scalp and facial injuries, cephalhaematoma, subconjunctival haemorrhage, birth asphyxia neonatal sepsis, fracture clavicle/humerus, were investigated and compared.

On 1st follow up in post natal ward, special attention was given to any excessive bleeding per vaginum and bladder habit. All neonates were examined by a paediatrician and followed for a period of 48 hrs thereafter. Conditions of mother and baby at the time of discharge was noted.

ANALYSIS OF RESULT

The results will be analysed by using various statistical techniques like percentage, mean, standard deviation, Z test, t-test, test of significance.
Statistical Methods –

The calculation of mean and standard deviation was done by method described by J.E. Park.

Mean –

Individual observation are added together and divided by the number of observation, process of adding together is known as summation and is denoted by $\Sigma$ or S. individual observation is denoted by sign $x$ at arithmetic mean is denoted by sign $\mu$. Total number of observation is denoted by ‘n’.

1. **Mean**  =  $\Sigma x/n$

\[
\text{It} \quad \text{So mean} = \frac{\Sigma x}{n}
\]

\[
\text{S.D.} = \sqrt{\frac{\Sigma (x-\mu)^2}{n}} \quad \text{or} \quad \sqrt{\frac{\Sigma (x-\mu)^2}{n-1}} \quad \text{If sample size is} \quad 30 \quad \text{or}
\]

It is calculated in following steps-

- First of all from arithmetic mean, deviation of each value is taken $(x-\mu)$.
- Each deviation is squared $(x-\mu)^2$
- All square deviations are $\Sigma (x-\mu)^2$
- It is divided by member of observations $\frac{\Sigma (x-\mu)^2}{n}$
- The square root is taken with give S.D.
2. Standard deviation –

4. **Z-Test**

\[
Z = \frac{\bar{X} - \bar{Y}}{\sqrt{\frac{(SD_1)^2}{n_1} + \frac{(SD_2)^2}{n_2}}}
\]

5. **t-Test**

\[
s = \sqrt{\frac{n_1 s_1^2 + n_2 s_2^2}{n_1 + n_2 - 2}}
\]

\[
t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}
\]

\[\text{df} = n_1 + n_2 - 2\]

\(s\) = The difference of S.D. of two samples.

\(\bar{X}_1 - \bar{X}_2\) = Two sample means.

\(n_1 \cdot n_2\) = No. of observations in the two sample.