

COMPARISON OF OBSTETRIC OUTCOME WITH KIWI OMNICUP VERSUS CONVENTIONAL CUPS FOR VACUUM-ASSISTED VAGINAL DELIVERY

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ABSTRACT

Objective: To assess the safety, efficacy and outcome of the Kiwi Omnicup in vacuum-assisted vaginal delivery relative to conventional cups.

Study design: Randomized Controlled Trial

Study place and periods: departments of Obstetrics and Gynecology, Ghurki Trust Teaching Hospital, Lahore and Lahore Medical and Trust Teaching Hospital, Lahore from September 2025 to February 2026.

Methodology: Total of 80 cases were selected and randomly divided into two groups. Group A used the Kiwi Omnicup and group B used the conventional cup for assisted vaginal delivery. Data was collected using a proforma and analyzed through SPSS v.26.

Results: The results showed no major differences in quantitative variables. The mean body mass index for group A was 22.25 and 21.95 for group B. The duration of suction and labour was greater for the conventional cup (7.28 vs 6.5 min, $p=0.021$ and 92.5 vs 91.88, $p\text{-value} = 0.89$). The number of cup detachments was higher in the Kiwi Omnicup (0.63 vs 0.33) and the number of failed deliveries was also higher in the Kiwi Omnicup (12.5% vs 7.5%).

Conclusion: The utilization of vacuum cups in assisted vaginal delivery is essential. The results of this study suggest that the Kiwi Omnicup can be used to lower the rate of episiotomies and other complications.

Key words: Kiwi Omnicup, vacuum-assisted vaginal delivery, episiotomies, traditional cups.

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INTRODUCTION

Before 1990, most deliveries occurred naturally without any physical assistance. During delivery, the mother's pushing efforts are combined with the contractions of the uterus to expel the baby from the uterus. Global maternal and perinatal mortality rates have dropped since 1990 as a result of the use of vacuum-assisted delivery, but the numbers are still concerning, with 293000 maternal deaths and 5.3 million stillbirths and neonatal deaths annually.¹⁻⁵ In 2019, Pakistan reported an MMR of 186 deaths per 100,000 live births. This means that for every 100,000 live births in Pakistan, 186 women died due to pregnancy-related complications. The high MMR in Pakistan is a cause for concern as it indicates poor maternal health care services and inadequate access to health care facilities.⁶

Despite extensive research, natural childbirth remains a challenge due to numerous complications such as baby size and abnormal

positioning, foetal distress, intrapartum infection, and so on. In cases where normal delivery is not possible and the second stage of labor has been reached, there are two options: i) Vacuum-assisted instrumental delivery, ii) performing a second-stage caesarean section. As a last resort, a C-section may be utilized for delivery. The prolonged second stage of labor and its associated complications, such as hemorrhage, infection, uterine rupture, obstetric fistula, and delivery asphyxia, are significant factors in maternal and neonatal morbidity and mortality.¹ Due to their ease of use and lower risk of maternal complications, vacuum-assisted delivery devices have remained a fundamental tool in physically assisting in childbirth for over 50 years in clinical practice.^{1,4,7}

In 1999, the disposable Kiwi OmniCup was introduced and looked like comparable with conventional ventouse cup regarding its

COMPARISON OF OBSTETRIC OUTCOME WITH KIWI OMNICUP VERSUS CONVENTIONAL CUPS FOR VACUUM-ASSISTED VAGINAL DELIVERY

applications and benefits. However, the Kiwi Omnicup failure rate was initially higher, at 30.1%, than the conventional ventouse cup failure rate of 19.2%. Recent studies have found that neonates delivered using the Kiwi Omnicup had much reduced pain responses in the first 24 hours than those delivered using metal cups.⁷ Instrumental deliveries have been found to be associated with increased pain during labor, early postpartum pain, perineal lacerations, hematomas, blood loss and anemia, urinary retention, and urinary and fecal incontinence, among several other maternal morbidities. On the other hand, vacuum-assisted vaginal deliveries may lead to significant fetal morbidities such as scalp lacerations, cephalohematomas, subgaleal hematomas, intracranial hemorrhage, facial nerve palsies, hyperbilirubinemia, and retinal hemorrhage.⁸

Vacuum extractors have been shown to be reliable, long-lasting, and safe to use, however they can also result in complications for the mother and the foetus. A lack of operator skill is frequently blamed for unsuccessful operative vaginal deliveries (OVD), which are directly linked to increased foetal and maternal morbidity. In the literature, the failure rate of vacuum-assisted delivery (VAD) differs and ranges from 1 to 34%.⁹ In order to assist the woman in giving birth vaginally, OVD refers to the use of forceps or a vacuum device. When used properly, the Kiwi Omnicup is a safe and effective OVD device. Aldo Vacca, the Omnicup Kiwi inventor,¹⁰ underlined the significance of adhering to a few principles when using the vacuum, including maintaining a position with flexion point identification and station presentation, avoiding more than four tractions, and discontinuing the procedure after three detachments. In order to protect females and enhance training, OVD demands accurate recordkeeping.^{8, 11}

Keeping in view the importance of the use of different devices (conventional cup or Kiwi Omnicup) for OVD has reduced the number of mortality and morbidity rates around the World. This study aims to determine if the utilization of the Kiwi Omnicup results in a lower rate of episiotomies and complications compared to traditional cups. A well-designed randomized controlled trial was needed to make decisions on the basis of evidence. The findings of this study will indicate whether or not it is appropriate to employ these strategies and tools. The study used a suitable sample size to precisely calculate failure rates.

METHODOLOGY

After obtaining approval from ethical board of hospital, this semi interventional study was carried out at the Department of Obstetrics and Gynecology, Ghurki Trust Teaching Hospital, Lahore and Lahore Medical and Trust Teaching

Hospital, Lahore from September 2025 to February 2026. Total sample size is 80; 40 cases in each group were estimated with a 5% significance level, 80% power of test, and a proportion of >1 detachment i.e., 44% with kiwi omnicup and 18% with conventional cup. All the females were enrolled by applying Non probability, consecutive sampling technique.

Inclusion criteria: Females of reproductive age group presenting at gestational age >34 weeks with estimated fetal weight > 2.5kgs

Exclusion criteria: Females with severe caput/ molding were not included.

The females that were chosen gave their informed consent. Demographics including name, age, BMI, gestational age, parity, number of previous vaginal deliveries was noted. Females divided in two groups by using random number table. Random numbers developed before randomization by using Microsoft excel and groups assigned to the particular case number. Delivery was done by senior obstetrician. Kiwi omnicup was available in the hospital. In group A, Kiwi omnicup applied for assisted vaginal delivery. In group B, conventional cups applied for assisted vaginal delivery. Receptive cups applied and fetus tried to be delivered out of the uterus. The number of detachments noted and if >1 attempt made then it was noted. Total duration of suction and duration of second stage of labour was also noted. If the fetal head does not move from its position and number of detachments >3, then procedure was considered as failed and recorded as failure of delivery. Failure of delivery with instrument was labeled if there will be >3 attempts need to attach vacuum cup to the head of fetus for delivery of fetus, but still fetus could not deliver. Females with failed vacuum extraction procedure were managed by caesarean section. All the information recorded through designed proforma.

SPSS version 26 was utilized for statistical analysis of the data. Quantitative characteristics such as age, gestational age, BMI, labour and suction times, were presented as mean and standard deviation. Qualitative factors including parity, the number of prior vaginal deliveries, the number of detachments >1, and the failure of instrumental delivery were reported as frequency and percentage. The mean suction time for the two groups was compared using an independent samples t-test, and the chi-square test was applied to compare the delivery failure rate and the instrument detachment rate. A p-value below 0.05 was considered significant.

RESULTS

Intention-to-treat analysis was used, and both groups had similar characteristics such as maternal age, gestational age at delivery, duration of second stage of labour, need for analgesia, need for assisted delivery, and birth weight (Table 4.4). In

COMPARISON OF OBSTETRIC OUTCOME WITH KIWI OMNICUP VERSUS CONVENTIONAL CUPS FOR VACUUM-ASSISTED VAGINAL DELIVERY

each group, for each descent station, the degree of formation, and the amount of caput, there were comparable numbers of malpositions. Similar numbers of pulls and suction durations were used by the two groups, but the Kiwis Omnicup group saw more cup separations. Regarding the placements, station of descent, amount of Caput, and degree of moulding, there were no significant differences between each group in. One of key factor was duration of second stage of labour as it plays its role in deciding whether to choose OVD with Conventional, Kiwi Omnicup or lead to C-section. Table-I

In this study, mean value of duration of second stage of labour was 92.18 minutes while it was greater for conventional cup in comparison with Kiwi Omnicup. Mean value for conventional cup was 92.5 whereas for Kiwi Omnicup it was 91.88. The student t-test was used to compare the means of the two groups, however no significant difference was found, as indicated by the p-value of 0.89 which was higher than the threshold of 0.05. But shorter time duration for Kiwi Omni cup proved that its better. Both groups were compared with a chi-squared test for the number of detachments and failures of delivery. A significant p-value of 0.0001 was recorded. The failure rate of delivery in the conventional group was 7.5%, while it was 12.5% in the Kiwi Omnicup group. One more thing is noted: most of the time, delivery failure occurred when the number of detachments was higher (0.63 for Kiwi Omnicup while 0.33 for conventional cup). Table-II

Table-I: Demographics of females enrolled in the both trial groups (n = 80)

	Kiwi Omnicup	Conventional Cup
N	40	40
Mean maternal age (years)	30.3±10	30.38±10
Mean gestation at delivery (weeks)	37.4	37.48
Mean duration of second stage of labour (minutes)	91.87	92.5
Parity		
Primigravida	14	13
Parity 1-2	19	18
Parity 3-4	4	4
Reason for cup (n)		

Failure to progress	28	30
Fetal distress	12	10
Mean birthweight (kg)	3.39	3.47
Position (n)		
OA position (n)	29	31
OP/OT position	11	9
Station of descent (n)		
1CM	5	6
2CM	10	9
3CM	25	25

Table-II: Comparison of outcomes observed during follow-up (n = 80)

	Kiwi Omnicup	Conventional Cup	P-value
Degree of molding (N)			
0	27	25	0.8520
1	11	12	
2	2	3	
Amount of caput (N)			
0	5	8	0.3746
1	22	24	
2	12	6	
3	1	2	
Mean duration of suction (minutes) (range)	6.50 ± 3.75	7.28 ± 5	0.433
Mean no. of detachment (% with ≥ 1 detachments)	0.63 ± 0.05	0.33 ± 0.05	<0.001
Duration of second stage of labour (min)	91.88 ± 25	92.5 ± 25	0.9120

DISCUSSION

The Kiwi OmniCup is a one-time-use device with a built-in hand pump. In the centre is inserted the

COMPARISON OF OBSTETRIC OUTCOME WITH KIWI OMNICUP VERSUS CONVENTIONAL CUPS FOR VACUUM-ASSISTED VAGINAL DELIVERY

flexible suction and traction element. In our study we evaluate the outcome of traditional cups and Kiwi Omnicups for vacuum-assisted distribution. Given that the key objective findings favored the Kiwi Omnicup group, which demonstrated higher advantages in terms of successful deliveries.

We included 80 females in our study and placed equally in two trial groups. In group 1 there were females included who were dealt with kiwi omnicup and group two were with conventional cup. We included age group female from 22-38. In our study mostly females were falling in age group 31-33 in both conventional and kiwi omnicup. BMI of each female was recorded in both groups averaging (21.95-22.25) there was no significant differences found. The gestational period in both groups were averaging 37.4 to 37.48. In our study parity comparison of both groups have done and shown almost same comparative results. Duration of suction was little bit higher 7.28 in conventional cup as compare to kiwi omnicup which was 6.5 min. Previously siggelkow *et al* published and shown almost same results as in our study but the main difference was duration of suction which is lower in our study as compare to them. The reason may be hands on practice inclination they have done the study back in 2015 when kiwi omnicup was not frequently in use during delivery. In the same study they did not find any significant differences in BMI and gestational time period. Most relevant results were there females were also falling in the age group 30-33¹².

In our study the numbers of detachments were 0.33 on average in conventional group while 0.63 were found in kiwi omnicup group. This data shows the failure of kiwi omnicup is higher than that of the conventional cup. These results are in support of the prospective randomized control trials done by KM groom (Groom *et al*) which shown that the mean detachment in kiwi omnicup was 0.68 as compared to conventional cup which they shown 0.28. This study shown the duration of second stage of labour was almost same in kiwi averaging 88.9 min and conventional 90.0mins. In our study the duration of second stage of labour was averaging 92 min in conventional and 91min were in kiwi omnicup delivery. Thus, these are in support of each other¹³.

In our study the birth weight at kiwi omnicup group was 3.39Kg and conventional was averaging 3.47kg in siggelkow *et al* the birth weight in kiwi was 3.36 and conventional 3.41kg. The foetal presentation at indication shown by this study Occipito-anterior 88% in kiwi omni cup and 86% in conventional while the Occipito-posterior were 3% in kiwi while 4% in conventional cup. In our study the Occipito-anterior positioning of fetus was 72% in kiwi omnicup while 77% were recorded in conventional cup group. The Occipito-posterior positioning were founded 28% in Kiwi omnicup

and 23% in conventional cup. In this regard both data sets are in support of each other. The differences in percentages numbers are due to difference in sample size, they used a larger sample size of 144 in each group while we used a very small sample size of 40 individuals in each group¹².

The main difference between conventional ventouse cups and the Kiwi Omnicup is in the design of the cup and the handle. Conventional ventouse cups have a metal handle with a smooth or textured surface, while the Kiwi Omnicup has a plastic handle with a rubber grip. The Kiwi Omnicup also has a more rounded, dome-shaped cup with a wider base and a thinner rim than conventional cups. Additionally, the Kiwi Omnicup has a unique release system that allows for the cup to be removed without having to break the vacuum seal.¹³

Observational studies on the effectiveness and safety of Kiwi Omnicup vacuum devices have produced conflicting findings. In a retrospective analysis, it was discovered that Omnicup successfully delivered a baby vaginally in 98% of the vacuum extractions it performed, with no evident increase in foetal scalp trauma.¹⁴

The sophisticated medical device intervention known as assisted vaginal delivery consists of many different parts. When designing and carrying out randomized controlled trials, this intricacy makes it challenging to describe, standardize, and monitor the intervention and take different levels of clinical experience into account.¹⁵

Station descents in our study were 1cm (12.5%), 2cm (25%) and 3cm (62.5%) in Kiwi omnicup while recorded 1cm (15%), 2cm (22.5%) and 3cm (62.5%) in conventional cup. We found the degree of moulding 0 in 27 females, 1 in 11 females and 2 in two females in kiwi omnicup group while in conventional cup group degree of moulding 0 were founded in 25 females while 1 were founded in 12 females and 2 founded in 3 females.

There is currently still insufficient valid data to resolve the debate conclusively on either to use conventional cup or kiwi omnicup during delivery. We conducted this study which might open further doors for researchers either to use conventional cup or kiwi omnicup.

One of the limitations of this study was that study was conducted on limited number of females due to time and financial constraints. A long term 10–15 years RCT based projects should be designed for conclusive outcome. Kiwi Omnicup is costly as compare to conventional cup. The result is from a single tertiary care hospital department and cannot be generalized.

CONCLUSION

The Kiwi Omnicup group offers more advantages than the traditional vacuum cup. The rate of success of Kiwi Omnicup can significantly rise

COMPARISON OF OBSTETRIC OUTCOME WITH KIWI OMNICUP VERSUS CONVENTIONAL CUPS FOR VACUUM-ASSISTED VAGINAL DELIVERY

when Obstetricians receive the correct instruction. Complications rate in both cups were comparable, regarding number of detachments of cup is one of the major causes of failure in Kiwi Omnicup. But overall results of our study prove that Kiwi Omnicup has more safety for both mother and baby.

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