ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 02 | February - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

VACCUM IS THE PREFERRED INSTRUMENT AMONG OBSTERICIANS IN RECENT TIMES

Obstetrics & Gynaecology

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ABSTRACT

Obstetricians must be able to perform operative vaginal birth (OVB). It is the most common obstetric emergency intervention, and it necessitates a high level of expertise. To find out which tool obstetricians prefer when doing surgical vaginal births, as well as the prevalence and hazards of vacuum or forceps assisted vaginal deliveries (AVD). The ACS Medical and Hospital in Chennai conducted this cross-sectional investigation. The survey comprised 500 obstetricians in all. All obstetricians in Chennai were issued an online survey. The best approach for a given situation, tool preference [vacuum or forceps], and perspectives on the difficulties associated with both vacuum and forceps use during vaginal delivery were all investigated. We calculated averages and percentages for the overall group and different subgroups based on the responses. The statistical analysis comprised a risk assessment of the result with exposure as an appropriate p-value. The questionnaire had a response rate of 92 percent (460/500). According to the data, obstetricians preferred vacuum because it was easier to use. The two groups had identical baseline characteristics. The most prevalent complication was a failed vacuum owing to cup slippage (65%), followed by caput succedaneum (22%), both of which were statistically significant. The most important finding was that maternal injuries in the vacuum group were only 3%, which was significantly lower than maternal injuries in the forceps group (70%) with a p-value of 0.001. The majority of obstetricians seemed to prefer using a vacuum during delivery. The use of a vacuum extractor instead of forceps for assisted delivery appeared to lower maternal morbidity, whereas neonatal injuries were more prevalent in vacuum-delivered babies. The equipment chosen should be tailored to the patient's needs as well as the obstetrician's knowledge and skill.

KEYWORDS

Assisted vaginal delivery, Vacuum, Forceps, Instrumental deliveries and Obstericians.

INTRODUCTION:

In surgical vaginal births, both vacuum and forceps are employed, although forceps skills have been less popular in recent years, and vacuum remains the staple because to its simplicity of use and lower maternal morbidity.

We must explore whether there is anything we can do to reverse this trend as the number of practitioners skilled in operational delivery decreases, and hence the ability to properly teach residents decreases.

The vacuum is the instrument of choice in Western Europe, Southern Asia, and the Middle East, according to data from the previous three decades. Despite the fact that both rates vary considerably throughout the world, current trends suggest that the caesarean delivery rate has climbed during the previous decade (17.3 % in India in 2005 and 38.8 % in 2018), while the operative vaginal delivery rate has fallen. In these surgical vaginal deliveries, the frequency of forceps births has decreased while the percentage of vacuum deliveries has increased. The main drivers of these modifications have been concerns about baby and mother safety, as well as a scarcity of experts with expertise using forceps who can train residents. [(2)]

The goal of this study was to get the opinions of practising obstetricians on their preferred instrument, whether vacuum or forceps, as well as their reasons for choosing it. It also looked into the complications experienced by the two groups and drew conclusions from the findings in order to suggest ways to improve vaginal delivery and, indirectly, reduce Cesarean section.

METHODOLOGY:

The research was carried out at the ACS Medical College and Hospital in Chennai. This research involved around 500 obstetricians in Chennai. The institutional review board gave their approval to the study.

Study design: Cross sectional study

Data collection tools:

Data was acquired from the Google form results after a series of five questions were put into Google forms [Online].

Questions:

1. I prefer
a. Vacuum b. Forceps for an unassisted vaginal delivery.
2. My reasons for preferring vacuum are:
a. it's simple to use, b. it doesn't require anaesthetic, c. it takes up less room, d. it may be used at a higher station, e. it causes less maternal morbidity, f. it's all of the above, g. it's none of the above.
3. Vacuum complications I've seen include:
a. Cup slipping out of vacuum; b. Maternal injuries; c. Bladder or Bowel Injuries; d. Caput Succedaneum; e. Neonatal Jaundice; f. Others; and g. None of the above.
4. My reasons for favouring force delivery include:
a. ease of use; b. lower neonatal morbidity; c. quicker delivery time; d. ability to use in preterm birth; e. all of the above; f. none of the above; and g. none of the above.

Other

5. Forceps complications: a. Forceps failure b. Maternal injuries c. Neonatal injuries d. Bladder or Bowel Injuries e. Others f. None of the above

Data processing and Statistical analysis:

The normal frequency percentage and odds ratio were used in the statistical study. Mean values were used to analyze the percentage distribution for the two groups. Fisher exact test with odds ratio was used to measure risk. When the anticipated cell frequencies were equal to or less than 5 of the p-value, this method was applied. It was determined that [$P<0.05$] was statistically significant. SPSS software was used to conduct statistical analysis.

RESULTS:

Of 500 participants 460 were responders (92%), 156 (34%) obstetricians preferred forceps and 304 (66%) obstetricians preferred vacuum. This is shown in figure – 1.

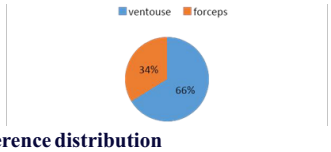

Figure:1 Preference distribution

In terms of indications, as well as maternal and neonatal outcomes, the two groups were compared. Obstetricians preferred vacuum over forceps because it was easier to use, took up less room, could be utilised at higher stations, and had reduced maternal morbidity. A majority of 72 percent said that several of the aforementioned factors together favoured vacuum over forceps. [Figure:2]

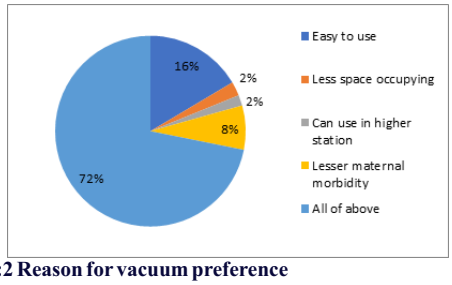

Figure:2 Reason for vacuum preference

Forceps had a considerably lower preference among obstetricians than ventose. 14 % of those who favored forceps said it was easier to use, and 12 % thought it took less time to deliver. Other considerations were lower newborn morbidity, a quicker delivery time, and the ability to employ it in preterm infants when vacuum is contraindicated. Overall, 64% of obstetricians agreed with all of the benefits listed above. [Figure: 3]

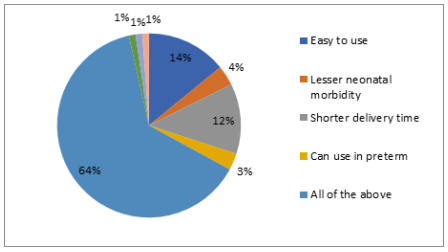

Figure:3 Reasons for forceps preference

PREFERENCES

Although the dilation of the cervix and the position of the foetal head play a big role in determining which instrument to employ, the operators' degree of comfort and familiarity with the instrument is also crucial. [Table:1]. In general, vacuum extraction is safer for the mother than forceps, whereas forceps is safer for the foetus than vacuum extraction. The suction was found to be the most commonly used equipment in assisted vaginal delivery in the current study. When compared to forceps births, vacuum deliveries are statistically significant.

Table:1 Preference of instrument

	Vaccum	Forceps	P value
Preference of instrument	304 (66%)	156 (34%)	0.004
Ease of Usage	25 (7.4%)	24 (14%)	0.001

The vacuum has its own set of issues. [Figure 4] The most frequent consequence was a failed suction owing to a sliding cup (62 %), followed by caput succedaneum (25 %), and then neonatal jaundice and bladder or intestinal damage. Vacuum utilization did not cause any issues for 8% of obstetricians. The most important conclusion was that just 2% of mothers had perineal and vaginal injuries, which was significantly lower than those who had a forceps delivery (68%)

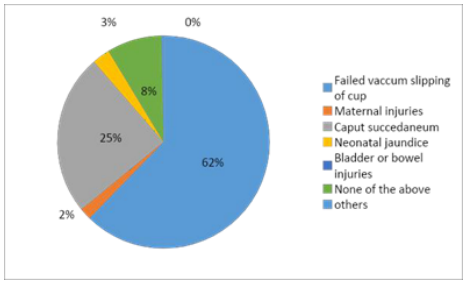

Figure:4 Complications encountered with vacuum

Obstetricians who chose forceps reported the most prevalent consequence (68 percent): maternal injury. The failure of forceps was followed by newborn injuries, cervical rips, sphincter injuries, and bowel and bladder injuries, which accounted for 11% of the total. Forceps were used by 15% of obstetricians without any consequences. [Graph: 5]

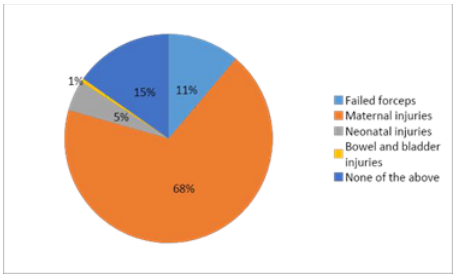

Figure:5 Complications with use of forceps

Risk Assesment Of Maternal Outcomes:

If used correctly, either vacuum or forceps can be effective and safe, but there are still hazards. The vacuum-assisted group had more women who were free of maternal perineum or vaginal damage than the forceps group, and the difference was statistically significant. ($p < 0.05$) When using vacuum instead of forceps, there was no significant change in the occurrence of bowel and bladder damage. $p>0.05$. Vacuum aided vaginal delivery had a higher rate of failed instrumental delivery than forceps, with a p value < 0.001. [Table: 2]

Table:2 Maternal Outcomes

Risks	Vaccum [n=304]	Forceps [n=156]	Odds ratio (CI=95%)	P-value
Maternal Injuries	7	116	0.009 (0,0.02)	<0.001
Boweland Bladder	0	1	0.00 (0.03,8.16)	>0.05
Failed instrumental delivery	210	19	13.46 (7.95,22.78)	<0.001

Risk Assessment Of Neonatal Outcomes:

Caput succedaneum was the most common neonatal complication which was more common among the vacuum-assisted deliveries than forceps. The difference was statistically significant, p-value <0.001 [Table 3]

Table:3 Neonatal outcome

	Vacuum [n=304]	Forceps [n=156]	Odds ratio CI=95%	P-value
Caput succedaneum / Neonatal injuries	83	8	6.7 (3.16,14.2)	<0.001

DISCUSSION:

In recent years, there has been a significant increase in cesarean section rates, which now account for more than 40% of all births, whereas instrumental deliveries account for just 5.3 % of all births in 2018. (5). An obstetrician or other obstetric care provider must be knowledgeable with the correct use of obstetric forceps or vacuum extractors, as well as the hazards associated. (6) The purpose of this study is to forecast existing information among obstetricians on the benefits and drawbacks of both types of instrumental vaginal birth.

The poll received responses from 504 obstetricians. One set of obstetricians [N = 304] favored vacuum, whereas the other selected forceps [N = 156]. The baseline characteristics of the two groups were identical.

The use of forceps in assisted vaginal delivery has fallen out of favour among obstetricians during the previous three decades. (7) Although vacuum extraction has lost favour, it is still more common than forceps delivery; this may be due to the fact that vacuum extraction is easier to employ than forceps. Some speculate that this decreased inclination stems from a concern of being sued over frequent forceps delivery issues, such as an increased risk of perineal laceration and newborn harm. (8) Others attribute the decrease in forceps use to a lack of resident training. Vacuuming, when compared to forceps, is less likely to result in a successful vaginal delivery.

Obstetricians who preferred ventose had a higher rate of assisted vaginal deliveries than those who used forceps in our research. Certain

clinical conditions may necessitate the use of one instrument over another. For example, forceps are excellent for delivering an occiput-posterior vertex with moulding, but a vacuum extraction is optimal for performing an outlet surgery on an occiput-anterior vertex in a lady with limited analgesia. (9) Although many of the variables are interrelated, the fall in the usage of obstetric forceps is multifaceted. Litigation has increased in all fields in recent years. Litigation and practise guidelines are linked to widespread concerns about obstetrician training. Obstetric forceps are potentially dangerous in the hands of untrained or inexperienced obstetricians. Most residency training programs in India no longer expect proficiency in mid-cavity forceps delivery. [10]

It's possible that vacuum extraction is quicker to learn than forceps, but there's some indication that the simplicity of usage might lead to overuse. Clearly, the method may be abused, thus the operator's judgement and competence are just as vital in this process as they are in any other. There are a few unusual cases in which the vacuum's special features offer an advantage over forceps, but neither the indications nor the benefits are common or unambiguous enough to propose that every obstetric unit have vacuum extraction apparatus and competence.

Six research (11,12,13,14, 15,16) investigated the broader clinical skills/assessment of clinical image interpretation required for effective AVD use. In the first instance, Bailee et al., 2017 (15) recorded specific clinical practises (as opposed to decision-making skills) from obstetricians and midwives deemed experts, such as techniques they used to encourage a spontaneous vaginal birth in a situation where it was possible to do so safely, but with the intention of quickly transitioning to instrumental birth if necessary.

In our study the usage of vacuum was preferred over the forceps. The difference was statistically significant with p value <0.005. This is similar to the study by Jennifer. Johnson et al who also showed that forceps were used more often than vacuum (P =.001). [16] The same study also showed a higher incidence of maternal third- and fourth-degree perineal (P <.001) and vaginal lacerations (P =.004) with the use of forceps, which was similar to our study which had a significant p value of < 0.001. Also Jennifer et al showed that the incidence of cephalohematomas were greater (P =.03) and caput and molding (P <.001) in the neonates delivered with vacuum, which is similar to our study which also had a significant increase of cephalhematoma in the vacuum group, p value < 0.001.

Multivariable logistic regression analysis showed that forceps use was associated with an increase in maternal injuries (odds ratio [OR] 0.009; 95% confidence interval [CI] 0,0.02; P <0.001), whereas vacuum was associated with greater neonatal injuries (OR 6.7; 95% CI 3.16.14.2; P <.001) and the rate of vacuum failure was very high as compared to the forceps. (OR 13.46; 95% CI 7.95,22.78; P =.001)

In Hamza et al study (17), 635 obstetricians completed questionnaires. Forceps were used far less frequently by all obstetricians than vacuum deliveries. Almost every obstetrician expresses a desire to do more births, suggesting a desire to learn both. Using vacuum instead of forceps gave obstetricians more confidence. In a similar obstetrical circumstance, most obstetricians would choose for a vacuum aided delivery. The great majority of obstetricians expressed an interest in receiving more training in vaginal operative deliveries.

Claire Feeley et al., 2021, (18) included 31 papers from 1985 to 2020 that reported on 27 investigations. The study employed qualitative designs (3), mixed approaches (3), and quantitative surveys (21). The 10 statements of findings were mostly untrustworthy, with one exception (moderate confidence). AVD competence, according to his research, is comprised of interrelated skill sets that include non-technical abilities (such as behaviours), general clinical skills, and particular technical skills associated with specific instrument utilisation. They observed that in order to gain abilities and confidence in this profession, practitioners needed and welcomed more specialised training, which encompassed a range of instructional modalities.

CONCLUSION:

Due to the convenience of use, vacuum is recommended over forceps in our study. While maternal morbidity is somewhat higher with forceps delivery, it is still minor in comparison to the morbidity associated with a caesarean section. In both types of instrumental deliveries, the majority of neonatal outcomes were similar. The instrument's safety is mostly determined by the operator's competence and patient selection. Improved instrumental delivery training for obstetricians may assist to further lower the present Cesarean Section rates.

Recommendations and Limitations:

In future study, it could be useful to ask obstericians why they don't feel competent, as there could be reasons other than a lack of competence. Obstetricians may have had a bad experience with forceps deliveries or watched a bad outcome. More data on residents' perceptions of their abilities to do various forceps deliveries should be acquired (outlet, low, mid, rotational, etc).

We did not have data to analyse as determinants of self-perceived competence such as gender, race/ethnicity, institutional volume, or operational delivery rates. We were worried, though, about retaining anonymity in order to promote participation.

REFERENCES:

1. Biringer A, Abells D, Boro J, Permaul JA, Sinha S, Graves L. Enhanced skills training in family medicine maternity care: Cross-sectional study of graduates' experiences. Canadian Family Physician. 2019 Dec 1; 65(12): e531-7.
2. Al Wattar BH, Mahmud A, Janjua A, Parry-Smith W, Ismail KM. Training on Kielland's forceps: A survey of trainees' opinions. Journal of Obstetrics and Gynaecology. 2017 Apr 3; 37(3):280-3.
3. Crosby DA, Sarangapani A, Simpson A, Windrim R, Satkunaratnam A, Higgins MF. An international assessment of trainee experience, confidence, and comfort in operative vaginal delivery. Irish Journal of Medical Science (1971-). 2017 Aug; 186(3):715-21.
4. Hamza A, Lavin JP, Radosa JC, Abou-Dakn M, et al. Vaginal operative delivery in Germany: a national survey about experience and self-reported competency. J Mater Fetal Neonatal Med 2020, 0(0):1–7.
5. Anozie OB, Osaheni LL, Onu FA, Onoh RC, Ogah EO, Eze JN, Mamah JE, Asiegbu OG, Anozie RO. Declining rate of operative vaginal deliveries in Nigeria. Open Journal of Obstetrics and Gynecology. 2018 Mar 13;8(03):175. http://www.scirp.org/ journal/ojog
6. Murphy, DJ, Strachan, BK, Bahl, R, on behalf of the Royal College of Obstetricians Gynaecologists. Assisted Vaginal Birth. *BJOG* 2020; 127: e70– e112.
7. Hotton EJ, Renwick S, Barnard K, Lenguerrand E, Wade J, Draycott T, Crofts JF, Blencowe NS. Exploring standardisation, monitoring and training of medical devices in assisted vaginal birth studies: protocol for a systematic review. BMJ open. 2019 Apr 1;9(4):e028300.
8. Goordyal D, Anderson J, Alazmani A, Culmer P. An engineering perspective of vacuum assisted delivery devices in obstetrics: A review. *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine*. 2021; 235 (1): 3-16. doi:10.1177/0954411920956467
9. Hobson, S., Cassell, K., Windrim, R., & Cargill, Y. (2019). Assisted Vaginal Birth. Journal of Obstetrics and Gynaecology Canada, 41(6), 870–882. doi:10.1016/j .jogc. 2018. 10.020
10. Emily J. Hotton, Erik Lenguerrand, Mary Alvarez, Stephen O'Brien, et al., Outcomes of the novel Odon Device in indicated operative vaginal birth. American Journal of Obstetrics and Gynecology, Volume 224, Issue 6. 2021, Pages 607.e1-607.e17.https://doi.org/10.1016/j.ajog.2020.12.017.
11. Matsumoto N, Takenaka T, Ikeda N, Yazaki S, Sato Y. Naegele forceps delivery and association between morbidity and the number of forceps traction applications: a retrospective study. Journal of pregnancy. 2015 Sep 3;2015.
12. Feeley C, Crossland N, Betran AP, Weeks A, Downe S, Kingdon C. Training and expertise in undertaking assisted vaginal delivery (AVD): a mixed methods systematic review of practitioners views and experiences. Reproductive health. 2021 Dec; 18(1):1-22. https://doi.org/10.1186/s12978-021-01146-3
13. Barros JG, Afonso M, Martins AT, Carita AI, Clode N, Ayres‐de‐Campos D, Graça LM. Transabdominal and transperineal ultrasound vs routine care before instrumental vaginal delivery–A randomized controlled trial. Acta Obstetricia et Gynecologica Scandinavica. 2021; 100(6):1075-81. https://doi.org/10.1111/aogs.14065
14. Bailey PE, van Roosmalen J, Mola G, Evans C, de Bernis L, Dao B. Assisted vaginal delivery in low and middle income countries: an overview. BJOG. 2017; 124(9): 1335–44.
15. Feeley C, Crossland N, Betran AP, Weeks A, Downe S, Kingdon C. Training and expertise in undertaking assisted vaginal delivery (AVD): a mixed methods systematic review of practitioners views and experiences. Reproductive health. 2021 Dec; 18(1):1-22.
16. Johnson JH, Figueroa R, Garry D, Elimian A, Maulik D. Immediate maternal and neonatal effects of forceps and vacuum-assisted deliveries. Obstetrics & Gynecology. 2004 Mar 1; 103(3):513-8.
17. Hamza A, Lavin JP, Radosa JC, Abou-Dakn M, Peitz I, Gerlinger C, Meyberg-Solomayer G, Ströder R, Juhasz-Böss I, Solomayer EF, Takacs FZ. Vaginal operative delivery in Germany: a national survey about experience and self-reported competency. The Journal of Maternal-Fetal & Neonatal Medicine. 2020 Apr 20:1-7.
18. Feeley C, Crossland N, Betran AP, Weeks A, Downe S, Kingdon C. Training and expertise in undertaking assisted vaginal delivery (AVD): a mixed methods systematic review of practitioners views and experiences. Reproductive health. 2021 Dec;18(1):1-22. https://doi.org/10.1186/s12978-021-01146-3