



Decision-making in operative vaginal delivery: when to intervene, where to deliver and which instrument to use? Qualitative analysis of expert clinical practice



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ABSTRACT

Objective: To identify the decision-making process involved in determining when to intervene, where to deliver and the optimal choice of instrument for operative vaginal deliveries in the second stage of labour.

Study design: A qualitative study using interviews and video recordings took place at two university teaching hospitals (St. Michael's Hospital Bristol and Ninewells Hospital, Dundee). Ten obstetricians and eight midwives were identified as experts in conducting or supporting operative vaginal deliveries. Semi-structured interviews were carried out using routine clinical scenarios. The experts were also video recorded conducting low cavity vacuum and mid-cavity rotational forceps deliveries in a simulation setting. The interviews and video recordings were transcribed verbatim and analysed using thematic coding. The anonymised data were independently coded by three researchers and then compared for consistency of interpretation. The experts reviewed the coded interview and video data for respondent validation and clarification. The themes that emerged following the final coding were used to identify the decision-making process when planning and conducting an operative vaginal delivery. Key decision points were reported in selecting when and where to conduct an operative vaginal delivery and which instrument to use.

Results: The final decision-making list highlights the various decision points to consider when performing an operative vaginal delivery. We identified clinical factors that experts take into consideration when selecting where the delivery should take place and the preferred choice of instrument.

Conclusion: This detailed illustration of the decision-making process could aid trainees' understanding of the approach to safe operative vaginal delivery, aiming to minimise morbidity.

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1. Introduction

Operative vaginal deliveries account for 11–13% of all births in the UK [1,2]. The decision to conduct an operative vaginal delivery is often made by a trainee obstetrician after prompting by a midwife. In a significant proportion of cases more than one course of action may be justifiable including watchful waiting [3]. When operative vaginal delivery is indicated, it is recommended by clinical guidelines that the operator should select the instrument most appropriate to the clinical circumstances and their level of skill [4]. The operator must also decide where the attempted operative vaginal delivery should take place. It is recommended

that operative vaginal deliveries that have a higher rate of failure should be conducted in a place where immediate recourse to caesarean section can be undertaken (usually within an operating theatre) [4].

When planning an intrapartum intervention it is important for an individual obstetrician to develop a stepwise decision-making scheme that can be consistently applied when a clinical situation arises. In current training, the emphasis is placed on the indications, contraindications and prerequisites for operative vaginal deliveries, with little emphasis on the decision-making process. This may be because these tacit skills are not readily identifiable during observation of a procedure. Within the clinical setting, decision-making about when to intervene, where to conduct the delivery, and what instrument to use is learnt experientially, often by trial and error. A trainee learns decision-making skills from observation of expert obstetricians and peers. The expert, however, may not always be able to articulate all the

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factors he or she has evaluated whilst making the decisions [5,6]. The technique of cognitive task analysis (CTA) allows the researcher to investigate in detail the various decision points in a task and the factors affecting the decision-making process [7,8]. This technique has been used to investigate non-technical skills in anaesthesia and surgery [9,10] and we have previously explored this approach in relation to low cavity non-rotational vacuum delivery [11].

In this study we aimed to use CTA to identify the decision-making processes involved in deciding when to deliver, where to deliver and which instrument to use following assessment of the woman for operative vaginal delivery in the second stage of labour.

2. Materials and methods

The study was based at two UK university teaching hospitals: St. Michael's Hospital, Bristol, and Ninewells Hospital and Medical School, Dundee. St. Michael's Hospital has over 5000 deliveries per year and Ninewells Hospital has almost 4000 deliveries per year. Both units are actively involved in teaching undergraduates and postgraduates and organising the specialist registrar training programme (postgraduate specialist training). Both units are comparable in terms of background obstetric practice. They have similar rates of induction of labour, use of epidural analgesia, operative vaginal deliveries and caesarean sections. By involving two units from different training regions we aimed to eliminate the institutional bias towards a particular practice and therefore increase generalisability. The participating expert obstetricians completed their training in units from six deaneries across England, Scotland and another two European countries, further adding to the generalisability of the research findings.

The participants for this study were purposively sampled to allow selection of individuals with in-depth knowledge and expertise in operative vaginal deliveries. For the purpose of this study we define an expert obstetrician as someone who is respected by their peers for his/her expertise in conducting operative vaginal deliveries. We have selected the experts based on reputation because we believe that the number of procedures performed or morbidity data for individual obstetricians would not provide a true representation of expertise. The experts perform fewer deliveries but these deliveries are often more complex than usual and therefore have a greater inherent risk of morbidity. Senior midwives working on the labour ward have witnessed numerous obstetricians performing operative vaginal deliveries and have formed an opinion about the expert ability of individual obstetricians. A list was drawn up of all the obstetricians in each unit who had at least five years' experience in obstetrics and gynaecology. Clinicians who did not have a regular fixed labour ward session were excluded from the list. The senior midwives were asked to rank the obstetricians. The criterion for ranking was that the obstetrician was competent and skilled at operative vaginal deliveries. The obstetricians who were consistently ranked highly were invited to take part in the study. The expert midwives were defined as senior midwives who acted as coordinating midwives on labour ward and were ranked highly for their experience and expertise by the midwifery managers and the lead consultant obstetrician for labour ward. All the invited experts agreed to participate in the study.

By targeting expert participants we aimed to enhance the quantity and the quality of data. The data from expert obstetricians were increased further because they had two observations each (recorded interview and video recordings). According to Morse [12], the greater the amounts of usable data that can be obtained from one participant, the fewer participants are required. Having purposely sampled data-rich participants, we anticipated that a sample size of ten obstetricians and ten midwives would be

required (thirty observations in total), with the plan to continue recruitment till there was saturation of ideas and no new themes emerged. The saturation of ideas was reached with a total of ten obstetricians and eight senior midwives between the two centres.

The expert obstetricians and the senior midwives were invited to a semi-structured interview. Each expert was given four clinical scenarios, reflecting good and bad operative vaginal deliveries they had witnessed. The aim of these scenarios was to investigate how experts use the clinical information provided to make decisions regarding the mode of delivery, selection of the place for delivery and choice of instrument. These scenarios depicted clinical situations with a range of complexity. The first scenario prompted the investigation of decision-making for a low cavity non-rotational delivery and the strategies for avoiding operative vaginal deliveries. The scenarios sequentially increased in complexity and the final scenario investigated the decision-making factors regarding a mid-cavity rotational delivery and the option of immediate caesarean section without attempting an operative vaginal delivery.

The introduction to the scenario mirrored a typical case summary given by a midwife when asking an obstetrician to review a woman in the second stage of labour. Further information regarding clinical findings was provided as requested by the expert. In order to make their implicit knowledge and decision-making more explicit, the experts were asked to elaborate on their decisions by asking 'how' and 'why' at each decision point. The experts were also asked to discuss the common errors they have noticed when supervising trainees, their recollection of a good and a poor delivery they had performed or witnessed, and the factors that had an impact on the outcome. When discussing errors in conducting operative vaginal deliveries, the experts were also asked the proposed actions they would consider to prevent these errors from occurring. Seeking senior help was considered a valid action for a trainee obstetrician. The expert obstetricians were then video recorded conducting two operative vaginal deliveries (one vacuum, one forceps) in a simulation setting using the same clinical scenarios. The videos and interview transcripts were reviewed by experts focussing on various decision points and the factors considered when making those decisions.

The interviews were transcribed verbatim and analysed using thematic coding. The Atlas.ti 5 computer package was used for coding the data [13]. The anonymised data were individually coded by the three researchers and then compared for consistency of interpretation. The codes were categorised into themes based on the decision points when considering an operative vaginal delivery. The decision points were clearly apparent from the expert interviews. The themes that emerged following the coding were reviewed by the original experts for respondent validation. Data from all the experts were amalgamated to formulate a list of clinical findings that would usually favour one instrument over another. This list was peer reviewed and further validated by three senior obstetricians outside the study regions, known for their expertise in intrapartum care and operative vaginal deliveries. Where there was discrepancy in the opinions of the experts, the opinion of the peer reviewers was taken into consideration to select the most appropriate opinion. The study was approved by the multi-centre regional ethics committee and the research and development departments at both units. Written consent was sought from each participant.

3. Results

In order to identify the steps taken in decision-making around operative vaginal deliveries, the first step was to identify the information used to make the decisions. Cognitive task analysis involves identifying the resources needed and the cognitive skills

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