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a prospective explorative study

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Original Article

Presence of the partner in the operating room during a category 1 cesarean section: a prospective explorative study

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ABSTRACT

Background: Little information exists regarding attitudes related to the presence of the partner in the operation room (OR) during category 1 emergency cesarean section (cat. 1 CS). We investigated how cat. 1 CS under general anesthesia is experienced, both by partners present in the OR and those not.
Methods: An explorative prospective cohort trial, with qualitative elements, involving all cat. 1 CS in 2022 in two hospitals. At site 1 the partner was present in the OR during cat. 1 CS, whereas at site 2 the partner was not. Parents and staff answered questionnaires following each cat. 1 CS and semi-structured interviews with partners were held three months after surgery. Qualitative data were analyzed using content analysis. The primary outcome was the partner's answer to the question: "Would you have preferred *not being present/being present* in the OR?" respectively.
Results: Seventeen and eight cat. 1 CS occurred at each site respectively. All parents agreed to participate. No partners in site 1 would have preferred to wait outside, and all evaluated the experience very positively. Partners at site 2 also evaluated not being present positively. Overarching themes from the qualitative analysis were "Being the family witness" and "Experience of being the partner". Mothers and staff from site 1 were very positive about their partners' presence.
Conclusion: Partners present in the OR during cat. 1 CS under general anesthesia evaluated this very positively. Most partners, who had not been present in the OR, also evaluated this positively. No partners had post-traumatic stress.

Introduction

Within the practice of anesthesiology, many clinical emergencies are handled each day. There is a growing focus on the presence of a partner or relative in these situations. Studies have reported that both patients and relatives prefer that relatives are allowed to be present during emergencies, even when it involves very severe events and conditions.[1,2] There seems to be a benefit for the relatives in experiencing less post-traumatic stress if present.[3,4] This also applies when considering severely-ill children, as studies have reported that parents prefer to be with their child, even during resuscitation, as the alternative of not being present, is perceived to be worse.[5,6]

However, in the setting of emergency cesarean section (CS), little information exists regarding the role of the father, partner or relative. A recent systematic review demonstrated a scarcity of relevant publications and very few clinical studies investigating the role of the partner.[7] None has investigated the role of the partner during category 1 CS (cat. 1 CS) when there is an immediate threat to the life of the mother or the fetus.[8]

In Denmark, the national goal for the decision-to-delivery interval in cat. 1 CS is a maximum of 15 min.[9] Some centers handle cat. 1 CS with mothers under spinal anesthesia, but many use general anesthesia. Traditionally, the partner waits outside of the operating room (OR) throughout. However, in one center (Kolding, Denmark) it was decided in 2021 to change this practice such that the partner does not leave the mother in a cat. 1 CS, and is present in the OR during induction of anesthesia, surgery and possible resuscitation of the infant.

The aim of this study was to investigate how cat. 1 CS conducted under general anesthesia is experienced, both in a setting where the

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partner is present in the OR and in a setting where the partner is not present.

Methods

This study was an explorative prospective cohort trial with two parallel cohorts, combined with qualitative elements. The study was conducted in two centers (Kolding/site 1 and Aabenraa/site 2, both in Denmark) and included all cat. 1 CS performed in 2022. At site 1, the partner is present in the OR, whereas at site 2 the partner waits outside. The partner could be the father, co-mother or another relative. The two trial sites are located 55 km apart, and are demographically and socio-economically similar. In 2021 site 1 managed approximately 3300 births, and site 2 approximately 1600 births.

Ethical approval for this study (case no. 21/62092) was provided by the Research Ethics Committee of the University of Southern Denmark. The study was registered with the Danish Data Protection Agency (case no. 21/56789) and the protocol made available on https://www.clinicaltrials.org in advance (NCT04948892). All mothers and partners gave written, informed consent. Staff were informed about the study before it commenced. When staff from site 1 had participated in a cat. 1 CS, an email was sent, inviting them to participate by filling out the questionnaire confidentially. Answering the questionnaire was taken as consent to participate.

At both sites the vast majority of mothers having cat. 1 CS receive general anesthesia. At each site, at least eight staff from six different specialties participate (two obstetricians, a pediatrician, an anesthesiologist, an anesthesiology nurse, two scrub nurses and a midwife). In site 1, the partner follows the mother into the OR, and is placed on a chair next to her head. An extra midwife takes care of and informs the partner throughout the procedure. The infant resuscitation table is placed within the OR, next to the mother's head. At site 2 the partner waits in the labor room or outside the OR during the cat. 1 CS and possible resuscitation of the infant.

Outcomes

The primary outcome of the study was the partner's answer to the question: "Would you have preferred *not being present* in the OR?" (site 1) or "Would you have preferred *being present* in the OR?" (site 2). Secondary outcomes were the mother's experience regarding her partner's presence, or not, in the OR; the partners' experiences during the CS and level of post-traumatic stress three months later; and the healthcare staff's experiences.

Data collection

Mothers and partners completed questionnaires on day 1 or 2 following the CS. Partners from both sites were contacted three months later via telephone, and an appointment was made to conduct a semi-structured interview a few days later. Partners were asked open questions concerning their experience with the CS. However, all were asked directly if they would have preferred to be present/not to be present in the OR, respectively. Partners were screened for post-traumatic stress using the PTSD-8 tool.[10] This tool has eight questions, covering the three domains of PTSD, namely intrusion, avoidance and heightened vigilance. The same person (HKN) conducted all interviews.

At site 2, heads of departments provided email addresses of all staff who occasionally participated in cat. 1 CS. These staff members were sent an electronic questionnaire, in December 2021, concerning their opinions about having the partner present in the OR or not. At site 1, the responsible healthcare professional from each of the six groups participating in the cat. 1 CS received an electronic questionnaire the day after.

At both sites, clinical data regarding the CS, the mother and the infant were collected from patient medical files. The questionnaires for parents and staff were developed based on inputs from six obstetric and anesthesiology staff with experience regarding emergency CS, and two couples, who had experienced a cat. 1 CS before. The questionnaire for parents was then pilot-tested on two couples following a cat. 1 CS, and small adjustments were made. The questionnaire for all six categories of participating staff was pilot tested following a cat. 1 CS, and small adjustments were made.

Qualitative data

All interviews with partners were recorded digitally and transcribed verbatim. Content was analyzed based on content analysis[11,12] and the NVivo software was used for coding data. Two authors (HKN and HIJ) read the transcripts multiple times, and coded the interviews individually. Thereafter coding was discussed, and meaning units were formed.[11,12] Subsequently, both authors sorted codes into categories and subcategories and through discussion overarching themes emerged. An independent translator professionally translated quotes from Danish to English.

Statistics

The study used a convenience sample and was a non-randomized exploratory study without statistical power to perform hypothesis testing. Due to the low number of cases, only descriptive statistics are presented.

Results

During 2022, 18 cat. 1 CS were performed at site 1, and nine at site 2. In site 1, one of the families was not approached for inclusion in the trial, since the partner was not in the country when the CS occurred. In site 2, one CS differed as it concerned a perimortem CS and no partner, so follow-up was not possible. Hence, 17 and eight cat. 1 CS, respectively, were eligible for inclusion. In site 1, three infants did not survive. All mothers and partners agreed to participate in the study (100%), and all partners participated in the three months follow-up (100%), although one partner (from site 2) did not wish to have the interview recorded. Baseline characteristics of parents, the operation and the infants were similar across the two sites (Table 1). At site 1, 16 mothers were under general anesthesia, and one received spinal anesthesia. All partners were present in the OR. In site 2, all eight mothers were under general anesthesia and partners were not present.

Regarding the primary outcome, one partner from site 1 would have preferred to have waited outside the OR during the surgical part of the CS (but not during the induction of anesthesia or the handling of the infant); all other partners from site 1 would not have preferred to wait outside the OR (Table 2). At site 2, two out of eight partners answered that they would have preferred to be present in the OR when asked immediately after the CS, however one had changed his mind three months later.

The majority of mothers at site 1 were aware that their partner was present in the OR (n = 16, 94%), and when asked how they felt about it, 16 (94%) answered "Very good" and one (6%) answered "Good". At site 2, the majority of mothers were aware that their partner was not present in the OR (n = 6, 75%), and when asked how they felt about that, three answered "Very good" or "Good" (38%), three answered "Both good and bad" (38%), and two answered "Bad" or "Very bad" (25%).

The staff of site 1 were predominantly positive towards having the partner present (response rate n = 97/102, 95%; Table 3). A total of 77% answered that it affected them either "Positively" or "Very positively" having the partner in the OR during induction of anesthesia.

Table 1
Baseline characteristics

	Site 1 (Kolding)	Site 2 (Aabenraa)
Number of included category 1 cesarean sections in 2022, n	17	8
Partner present in the operation room during induction of anesthesia, cesarean section and handling/ resuscitation of infant, n (%)	17 (100)	0 (0)
Type of anesthesia:		
General anesthesia, n (%)	16 (94)	8 (100)
Spinal anesthesia, n (%)	1 (6)	0 (0)
Identity of partner:		
Father, n (%)	16 (94)	8 (100)
Mother's mother, n (%)	1 (6)	0 (0)
Age, partner (y), median (IQR)	32 (31,34)	34 (31.5,35.5)
Age, mother (y), median (IQR)	30 (28,32)	30.5 (26,33.5)
Parity (including current pregnancy), median (IQR)	2 (2,2)	1.5 (1,2)
Anticipated difficult airway, n (%)	0 (0)	0 (0)
Difficult intubation (more than one attempt needed), n (%)	0 (0)	1 (12.5)
Mother's ASA physical status, median (IQR)	2 (2,2)	2 (2,2)
Mother's BMI (kg/m^2) median, IQR	28 (25,31)	28 (24.5,32.5)
Indication for caesarean section, n (%):		
Uterine rupture (actual or suspected)	4 (24)	0 (0)
Abruptio placenta (actual or suspected)	2 (12)	1 (13)
Umbilical cord prolapse	2 (12)	4 (50)
Suspected asphyxia/severe bradycardia of infant	9 (53)	3 (38)
Time from decision to delivery of baby (min), mean (IQR)	11 (9,12)	9 (8,11)
Operation time (min), mean (IQR)	30 (20,35)	33.5 (28,73.5)
Bleeding pre-operatively (mL), median (IQR)	450 (300,750)	580 (300,1025)
Bleeding in recovery unit (mL), median (IQR)	100 (50,200)	25 (0,60)
Apgar score, median (IQR)		
1 min	8 (3,10)	9 (5.5,10)
5 min	10 (5,10)	9.5 (9,10)
10 min	10 (9,10)	10 (10,10)
Ventilation of infant, n (%)	9 (53)	5 (63)
Cardiac massage of infant, n (%)	4 (24)	0 (0)
Infant admitted to neonatal intensive care unit, n (%)	5 (29)	4 (50)
Infant did not survive first week, n (%)	3 (18)	0 (0)
Peri-operative complications, n (%)		
Severe uterine atony	1 (6)	0 (0)
Perforation of bladder or bowel	0 (0)	0 (0)
Other	0 (0)	0 (0)
Re-operation within the first 48 h, n (%)	0 (0)	0 (0)
Maternal blood transfusion within the first 48 h, n (%)	0 (0)	0 (0)

ASA: American Society of Anesthesiologists. BMI: body mass index IQR: interquartile range.

Likewise, 77% and 81% respectively found that it affected them "Positively" or "Very positively" having the partner present during the CS itself and during possible resuscitation of the newborn. Only 3% answered that they would prefer that the partner was not present. The staff of site 2 (response rate n = 134/199, 67%) had differing opinions on the matter (Supplementary Table A). In total, 43% preferred that the partner was not present in the OR, 32% preferred that the partner was present, and 25% did not know.

Interview content

In total, 24 follow-up interviews with partners were recorded and transcribed, each lasting from 4 to 24 min (mean 15 min). Two themes were identified: "Being the family witness" and "Experience of being the partner in a cat. 1 CS". An overview of coding, themes and categories is presented in Supplementary Table B.

"Being the family witness". The majority of partners from site 1 expressed positive feelings about being able to contribute with knowledge of what happened in the OR to the mother, thus enabling them to construct their narrative of the birth experience. This theme was less pronounced in partners from site 2. *"It gives the father a role, because he has to pay attention and listen and look, so that the story can be retold, at least that's the way I see it. It is important, perhaps not so much for the child, but it is important for the mother that the right story is told to her."* (K1)

Many partners from site 1 speculated that it would have been worse not to be present and to not know exactly what was happening. *"It would have been unbearable if I had been sitting there waiting in another room."* (K9) Further, many partners expressed that it was important for them to be with their infant as soon as it was delivered, a comment that was less frequent from partners from site 2.*"At any time, and this is almost the most important for me, to be allowed to be there, just so that there was a parent who could hold our child for those hours, or however long it took before the child could be with the mother, so he got my smell and my warmth. That matters a lot to me and my wife."* (K6)

"Experience of being the partner in cat. 1 CS". Anxiety and fear for the life of both mother and child were expressed by many partners from both sites. *"I remember walking around, preparing what to say to our daughter at home. If I did not get them home with me."* (A8) The majority of partners from both sites described feeling well informed and supported by the staff during the CS, and they highlight this as crucial for their ability to cope with the situation. *"It was nice to have someone who'd take your hand, 'cause that was what they did. It was really nice, I was glad that there was someone who could explain what happened and was there, beside me."* (K10)

When the outcomes were good, partners unanimously expressed feelings of joy and great relief. In cases where the infant died, partners expressed feelings of despair. *"I wouldn't have been without it, I went over and touched him [the dead infant] and then I really realized it, and I collapsed in tears."* (K15) None of the partners who had been present in the OR spontaneously mentioned the intubation. When asked about their experience with it, the majority had not paid much attention to it (Supplementary Table C) but a few found it disturbing.

Post-traumatic stress

None of the partners from either site screened positive for PTSD (Table 4) and scores were generally low.

Discussion

In this exploratory clinical study, we found that partners who were present during cat. 1 CS under general anesthesia evaluated this experience very positively. Partners who were not present during cat. 1 CS also generally evaluated their experience positively. No partner developed PTSD. Mothers and staff in a setting where the partner was present evaluated this very positively, and in the setting where partners were not present evaluations varied, ranging from very good to very bad. Staff in this latter setting also had mixed opinions, with the majority skeptical of its value.

This study is the first to investigate the presence of the partner in the OR during cat. 1 CS under general anesthesia. Parents' experiences of being present in a pediatric intensive care unit during attempted resuscitation of their child have been investigated, and the parents' need to be present with their child was more important to them than the possible trauma of witnessing the resuscitative efforts.[5] Many believed not being present would feel more distressing and would complicate coping subsequently.[5] The experiences of partners present during resuscitation of their newborn in the delivery room has also been investigated.[13] Partners recalled their emotions during resuscitation vividly, and the emotions were mostly negative but none

Table 2
Primary outcome. Partners' answer to the following question is stated for each partner. The question was asked in a paper questionnaire on day 1 or 2 following the category 1 cesarean section and again in the follow-up telephone interview three months later

	Site 1 (Kolding): "Would you have preferred waiting outside the operating room?"		
Partner	Day 1 or 2	Three months later	3 months later, quote from partner
K1	No	No	"Absolutely not. I would prefer to hold my wife's hand at any time, and also at any time – this is almost the most important thing for me – to be allowed to be a parent who could hold his child for the 2.5 hours or however long it takes before the child is handed over to the mother, so that he had sensed my scent and my warmth. It means a lot to me and my wife that he was in my hands and not just in the midwife's or nurse's, and not in an incubator. So absolutely not, I would want to be in there at any time even if it was more urgent. It's about the whole story of what happened"
K2	No	No	"No, I would not (…) If it should happen again, I would be there just as much as I was this time"
K3	No	No	"I really would not want to, I'd rather be in there"
K4	No	No	"I was actually happy to be there. Afterwards, I feel good about having been there. I would have felt a little strange about not being there. (…) It's not that I think afterwards that it was a very unpleasant experience. Indeed, it was a very strong experience, but I don't think it was an unpleasant one, no."
K5	No	No	"Not me, but I would like to get the choice if I was in a place where I didn't want to come along. When it's so urgent, you don't want to decide on an awful lot either, but as long as there is a nurse with the father, and the father can say, 'I want to get out of this', then taking him in is the best option. It is much worse not to get the opportunity to get in and see it."
K6	No	No	"It's a very clear no. I really want to be in there. I think it's super nice that you can do that now"
K7	No	No	"No, it was fine"
K8*	No	No	"It was fine, I wouldn't have missed it for the world […] I think it is a good thing that you can be in there"
K9*	No	No	"No, I would not. (…) For me it's a positive thing to have had the opportunity. I can't speak for everyone, but I think it was a nice opportunity to get and I haven't regretted that I came in either. Not at all; it would have been unbearable if I had been sitting there waiting in another room"
K10	No	No	"It was very important for me to be in the room during the entire process. I can't imagine it any other way. Being outside would be absolutely horrible, I would say."
K11	No	No	"No, I was really happy to come with her right up till the time she was anesthetized, that was when I let go and was allowed to act myself. It was nice to be allowed to accompany her all the way in there and to talk to her and be with her, so she knew I was present. I think that was actually super nice."
K12	No	Some of it [during the operation]	"At least have had the opportunity while they opened her up, if I could have only seen when he came out, where they take him up, if I could do it again I would have closed my eyes until he came out (…) It made it all worth it [being there when the infant was delivered and put on the resuscitation table], I really think, it was a great experience, seeing him come out and come over and get to see him for the first time (…) I have got the question many times, if I actually would have wanted to be in there, but I simply don't know, if I should get the question another time, because it is also a fantastic experience to see and be there"
K13	No	No	"No, I was happy that I was allowed to come in, I was really happy"
K14	No	No	"No, I would prefer being in there, I would not have preferred to be somewhere else […] Even if the outcome had been different [if the infant had died] I still think so; you see how hard they work to save the life of a little child, so… then you know how much is being done"
K15*	No	No	"No, not at all. I'm very glad that I wasn't asked whether I wanted the option; that is, I then would have had to think about it. […] No way I would have been without it"
K16	No	No	No, I don't think so. Also, even if it had been the first [child], I wouldn't have wanted to be outside either. I think I'd rather be inside and be involved or at least see it. I'm pretty sure… I'm glad that the opportunity was there this time"
K17	No	No	"Not at all"
	Site 2 (Aabenraa): "Would you have preferred being present in the OR?"		
Partner	Day 1 or 2	3 months later	3 months later, quotes from partners
A1	No	No	"No, I actually wouldn't. Not when I heard how many doctors there were and how quickly it went, I would rather not be there"
A2	Yes	Yes	Yes, I would like to. I would have liked to have been there and experienced it. (…) Yes, but really, I should have been there. I wouldn't say I am squeamish, but I could see it was quite dramatic, and he wasn't breathing when he came out either. I don't think that everyone could handle it equally calmly. It was really just because I wanted to hold my wife's hand until she fell asleep, because she wasn't feeling well. She thought it was a very long way down to the operating theatre."
A3	No	No	"If it had been planned yes, if it's something very urgent like that, I think it's quite alright that I just sat out there"
A4	No	No	"No, I actually wouldn't, not in that situation. I was also fine with not getting the choice"
A5	No	No	"I remember somehow thinking that I was glad I didn't have to go in there"
A6	Yes	No	"I was standing 3–4 meters away, just a door between us" "I could see through a window, and sense how it was going (…) I would not want to be in there when she was under general anesthesia, I think it would have made the experience more dramatic"
A7	No	No	[Did not wish to have interview recorded]
A8	No	No	"To be in there, I think that will be too much because you go from a natural birth and then this sudden change. For the man, I think it is simply too much"

* Infant did not survive.

expressed a wish not to be present.[13] There is currently a trend towards letting relatives attend emergency medical situations.[14] Patients most often prefer that their relatives are present, and most relatives also prefer being given the opportunity to be present,[2,15] which is in line with the findings in the current study. It seems difficult for both mothers, partners and staff to imagine a different scenario to the one they have experienced. Most evaluate the scenario experienced in a positive way, so perhaps imagination is worse than reality.

Regarding induction of general anesthesia and intubation, some staff from site 2 considered this situation would be distressing for the partners. However, none of the 17 partners who witnessed the induction of anesthesia and intubation firsthand spontaneously mentioned this event as unpleasant, and when asked directly about it, most had paid little attention to it or considered it "part of the game". This is an example of a strong narrative among staff that "it is very distressing for partners to see their wife being intubated", which appears not nec-

Table 3
Opinions of healthcare staff from site 1. Following the 17 category 1 cesarean sections at site 1 (partner present), in total 102 healthcare staff received a questionnaire, this person being the responsible person from each group (obstetricians, anesthesiologists, anesthesiology nurses, pediatricians, scrub nurses and midwifes). In total, 97 persons completed the questionnaire (95%)

Healthcare professionals	Response rate				
Obstetricians, n (%)	16 (94)				
Anesthesiologists, n (%)	16 (94)				
Anesthesiology nurses, n (%)	17 (100)				
Pediatricians, n (%)	16 (94)				
Scrub nurses, n (%)	17 (100)				
Midwives, n (%)	15 (88)				
Years of experience within this professional field, median (IQR)	12 (4,25)				
Answers to questionnaire	Very positively	Positively	Both positively and negatively	Negatively	Very negatively
"How does it affect you to have the partner present in the OR during *the induction of general anesthesia*?", n (%)	28 (29)	47 (48)	22 (23)	0 (0)	0 (0)
"How does it affect you to have the partner present in the OR during *the cesarean section*?", n (%)	32 (33)	43 (44)	20 (21)	2 (2)	0 (0)
"How does it affect you to have the partner present in the OR during *the handling/possible resuscitation of the infant*?", n (%)	49 (50)	30 (31)	15 (15)	3 (3)	0 (0)
Would you prefer that the partner was NOT present in the OR during category 1 cesarean sections?, n (%)	Yes 3 (3)		No 88 (86)		Don't know 6 (6)

IQR: interquartile range. OR: operating room.

Table 4
Post-traumatic stress in partners after three months

	Site 1 (Kolding, partner present), n = 17				Site 2 (Aabenraa, partner not present), n = 8			
Partners, screened to have PTSD, n (%)	0 (0)				0 (0)			
Answers to each question:	Not at all	Rarely	Some-times	Most of the time	Not at all	Rarely	Some-times	Most of the time
1: Recurrent thoughts or memories of the event, n (%)	11 (63)	4 (25)	1 (6)	1 (6)	4 (50)	3 (38)	1 (12)	0 (0)
2: Feelings as though the event is happening again, n (%)	16 (94)	1 (6)	0 (0)	0 (0)	4 (50)	4 (50)	0 (0)	0 (0)
3: Recurrent nightmares about the event, n (%)	17 (100)	0 (0)	0 (0)	0 (0)	8 (100)	0 (0)	0 (0)	0 (0)
4: Sudden emotional or physical reactions when reminded of the event, n (%)	12 (69)	4 (25)	1 (6)	0 (0)	2 (25)	6 (75)	0 (0)	0 (0)
5: Avoiding activities that remind you of the event, n (%)	16 (94)	0 (0)	1 (6)	0 (0)	7 (88)	0 (0)	1 (12)	0 (0)
6: Avoiding thoughts or feelings associated with the event, n (%)	17 (100)	0 (0)	0 (0)	0 (0)	4 (50)	3 (38)	1 (12)	0 (0)
7: Feeling jumpy, easily startled, n (%)	16 (94)	0 (0)	1 (6)	0 (0)	5 (63)	2 (25)	1 (12)	0 (0)
8: Feeling on guard, n (%)	13 (75)	1 (6)	3 (19)	0 (0)	5 (63)	1 (12)	1 (12)	1 (12)

Data from screening for post-traumatic stress disorder (PTSD), performed as part of the follow-up interview at three months. The screening tool used was the PTSD-8 inventory, consisting of eight questions, covering the three domains of PTSD: intrusion (question 1–4), avoidance (question 5–6) and heightened vigilance (question 7–8). For each question, subjects can answer: "not at all", "rarely", "sometimes" or "most of the time". To screen positive for PTSD, subjects must answer "sometimes" or "most of the time" to at least one question within each of the three domains.

essarily true. In other contexts, staff are not always able to predict patients' preferences.[16]

In three of the cases where the partner was present in the OR, the infant did not survive. These obviously very distressing clinical situations have not previously been investigated.[7] Looking into these three cases, we found that the partners involved evaluated being present positively. They unanimously described that it was important to them to know and have seen what was done in an attempt to resuscitate their child, and that they valued being able to pass this information on to the mother.

The most prevalent theme in the analysis of interviews with partners who were present was that the partner can act as the "family witness" and contribute important information, filling out missing pieces in the mother's narrative. Both mothers and partners seemed to find this important.

Successful handling of complex clinical emergencies depends on factors besides technical excellence, many being non-technical, such as communication and teamwork.[17] These factors are difficult to standardize. From our one year of experience with partners present in the OR, it is clear that a success requires everyone in the OR to "buy in" on the concept, with all practical details concerning the partner agreed upon beforehand. Having an extra person (in this study a midwife) present in the OR throughout the CS to support and inform the partner seemed important to its success. Partners described feeling guided, informed and cared. The availability of an extra person might be a limiting factor for the implementation of allowing partners in the OR at cat. 1 CS, although the role of the anesthesiologist could also be explored. However, even if not in the OR, the partner deserves support and explanation of what is happening, as they are often fearing the worst.

Having the partner present in the OR was introduced during the COVID-19 pandemic. However, in the summer of 2021, the pandemic was in a stable state in Denmark, with most Danes vaccinated, such that relatives were not restricted from entering the OR for other procedures at the particular hospitals. Isolation measures were applied if needed but COVID-19 was not a barrier for the implementation of the policy at site 1.

There are limitations to this study, which was not randomized as this was considered neither fair nor feasible given the time pressure. We therefore studied two centers in which clinical practice differed.

Even though these centers are geographically close and similar, clinician- or hospital-specific differences may have affected the results. Therefore, this study can be used to explore the topic of partner presence, but not to draw conclusions. The study nevertheless has several strengths, being prospective and applying different research methods. The sample size was small but participation rate very high, limiting the risk of selection bias. Further, it is the first study to investigate partners at an emergency CS, and to include cases where the infant did not survive.[7] As mortality is unfortunately an inherent risk in cat. 1 CS, we considered it important to generate information about how these cases can be managed.

In conclusion, in this prospective exploratory cohort study we found that partners who had been present in the OR during cat. 1 CS under general anesthesia evaluated their experience very positively. This also applied to partners who lost their infants. Mothers and staff likewise evaluated the partners' presence positively. Most partners who had not been present in the operating room also evaluated their experience positively. None of the partners from either site screened positive for PTSD three months after the cesarean section.

Declaration of interests

All authors declare no conflicts of interest.

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Appendix A. Supplementary material

Supplementary material to this article can be found online at https://doi.org/10.1016/j.ijoa.2023.103939.

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