Abstract

INTRODUCTION: During pregnancy, expectant mothers may experience fears relating to various factors. Following stressful experiences of infertility and treatment, Assisted Reproductive Technology (ART) mothers may be particularly susceptible to fears during pregnancy. PURPOSE: This paper uses a qualitative approach to explore these fears following conception using ART. METHODS: Nineteen expectant first-time mothers were administered a semi-structured interview during the third trimester of their pregnancy. Interviews assessed perceptions of and feelings about pregnancy, and were analysed using content analysis. MAIN FINDINGS: Data were categorized into themes and subthemes with four overarching themes emerging: the baby's survival, the health of the baby, the efficacy of the mother, and the physical delivery of the baby. Of these, the most commonly reported fears were related to miscarriage or fetal death, and to the baby being born with an abnormality. CONCLUSIONS: In spite of expressing some fears that can be also seen in spontaneous pregnancy, women who conceived after ART report some fears that are more specific to this context, such as miscarriage or fetal death. Limitations of this study include not considering the partner's experience, and that the qualitative approach limits generalisability. However, results suggest that the concerns reported could be taken into consideration when providing psychological support for ART mothers.

Keywords: fears; pregnancy; Assisted Reproductive Technology; parenting

Introduction

Pregnancy is a time of transition incorporating physical and psychological changes (Guedeney, Tereno, 2010), when psychological conflicts and emotional feelings from earlier life-stages are reactivated and need to be integrated into this new experience (Raphael-Leff, 2010). The expectant mother prepares mentally for permanent changes and for new responsibilities that will come after the birth of the baby (Melender, 2002). At the same time, women may experience a range of fears which could affect their experience of pregnancy. Common fears often relate to labour and birth, such as whether the pregnancy will last beyond the due date which could result in maternal injury (Melender, 2002; Sercekus, Okumus, 2009), and uncertainty as to whether the labour will be lengthy (Sercekus, Okumus, 2009) and painful (Shahoei et al., 2011). Mothers worry about whether they will be able to give birth to the baby or whether they might die during the delivery (Sercekus, Okumus, 2009; Shahoei et al., 2011), or simply that they will not know how to handle the excitement of that moment (Raphael-Leff, 1991). Questions about one's own capacity to produce something live, good and valuable (Raphael-Leff, 1991), and fears about having a preterm-baby (Piccinini et al., 2004; Shahoei et al., 2011) or a child with some malformation are common (Piccinini et al., 2004). Furthermore, women may worry about their maternal efficacy after the birth (Melender, 2002; Shahoei et al., 2011). Pregnancy is a time of regular contacts with professionals in order to get more information about the state of the baby, the timing and type of birth), and then using this information to calm and reassure the mother that the baby is in good health (Piccinini et al., 2004).

Therefore, each pregnancy is unique, with moments of joy but accompanying difficult emotional states (St-Andre & Martin, 2010). Expectant mothers need to find their own way to cope, dealing with old and new feelings that arise (Raphael-Leff, 2010). These

changes could be particularly difficult in the context of Assisted Reproductive Technology (ART), where the distress associated with infertility may linger on and concerns, particularly about the health of the baby and miscarriage, may be heightened (Harf-Kashdaei, Kaitz, 2007). Therefore, the objective of this study was to explore the experiences of pregnancy following ART, focusing on maternal fears.

Some studies have found that women who conceived through ART actually presented more positive moods during the latter stages of pregnancy than those who conceived spontaneously (Harf-Kashdaei, Kaitz, 2007) and that the experience was perceived as a rewarding one by ART mothers during the second trimester (Gameiro et al.,2010). Furthermore, expectant IVF mothers at halfway through their pregnancy did not experience more severe or more frequent fear of childbirth, or higher pregnancy-related anxiety, than spontaneous conception mothers (Poikkeus et al., 2006; Stanton, Golombok, 1993).

However, other research has found that, following birth, ART mothers retrospectively report more emotional vulnerability and more frequent difficulties in adaptation to pregnancy than mothers who conceived spontaneously (Lepecka-Klusek, Jakiel, 2007). Concerns have been reported by ART mothers during the last trimester about the baby's well-being, the possibility of fetal death or congenital malformations, fear of labour, and the possibility of the baby having to stay in NICU (Dornelles, Lopes, 2011; Klock, Greenfeld, 2000; McMahon et al., 1997). Negative feelings related to the previous infertility may be still present after pregnancy is achieved and affect the experience of pregnancy (Harf-Kashdaei, Kaitz, 2007; Hjelmsted et al., 2004). In line with this idea and in contrast to earlier research, McMahon et al. (2011) found that ART mothers did show higher levels specifically of pregnancy-focused anxiety than spontaneous conception mothers.

The majority of these studies used large samples, collecting quantitative data. This approach is important for identifying symptoms, frequencies and intensities, and generalising results but may not capture the in-depth experiences of these women during pregnancy. Overall, less is known about fears of expectant mothers following ART than in the context of spontaneous conception. Considering the relevance of the experience of pregnancy for the mother and her baby, this study intends to provide a different perspective on this experience for ART mothers. Thus, the first aim was to explore qualitatively the fears of pregnant women who had conceived through ART. The second aim was to relate these fears to existing literature to examine how they compare to those expressed by pregnant women who had conceived spontaneously.

Methods

Participants

The current study is part of a larger qualitative project *Transição para a parentalidade e relacionamento conjugal no contexto da reprodução assistida: da gestação ao primeiro ano do bebê (Transition to parenting and marital relationship in the context of assisted reproduction: from pregnancy to the first year of the baby)* developed in Brazil by Universidade Federal do Rio Grande do Sul, Instituto de Psicologia and Hospital de Clínicas de Porto Alegre (HCPA), and approved by the ethics committee of HCPA. Inclusion criteria are that couples had conceived through ART after a treatment at HCPA or at a private clinic within the region, and live in the state of Rio Grande do Sul. Couples were recruited and assessed first during the third trimester of pregnancy.

The current report is based on data collected from the women in the couples, including only those who were first-time mothers (n=19), in order to control for previous

experience and knowledge of the realities of pregnancy. All participants were contacted by a researcher and after giving informed consent, an individual interview was set. Women were assured that their responses were confidential and that they could withdraw from the study at any time without this interfering in their treatment. The participants ranged in age from 25 to 44 (mean age 35 years) and almost all were Caucasian (89%). The majority were married (63%) and the remainder were cohabiting (37%). Regarding educational levels, the group was generally well-educated; 63% had a university degree (of which half had a post-graduate qualification), while the other 37% were high-school graduates. Considering the cause of infertility, 79% was female, 10.5% was male, 5.3% was both and 5.3% was unknown. The most frequent treatment was straightforward IVF (79%), but artificial insemination (16%) and gamete donation (5 %) were also used. The majority of the participants had conceived following their first treatment (53%), while others had undergone two or more treatments. Most pregnancies were singletons (79%), but one was twins (5%) and three were triplets (16%).

Materials

Semi-structured interviews (Núcleo de Infância e Família, 1998, unpublished data), used previously in a study on spontaneous pregnancy (Estudo Longitudinal de Porto Alegre: Da Gestação à Escola, unpublished data), were conducted during the third trimester, at the participants' home or other convenient place chosen by them. The interviews addressed the experience of pregnancy, and focused on their perceptions and feelings about pregnancy and the baby. A question about the impact of treatment on their pregnancies was included, considering the hypothesis that the experience of pregnancy in the context of ART may be affected by previous infertility and the demands of the treatment.

Analytical approach

The interviews lasted about one hour and a half, and were recorded and transcribed. Content analysis was used to disassemble the structure and elements of the content in order to clarify its different characteristics and extract their meanings (Laville, Dione, 1999). Themes referred to by literature on spontaneous pregnancy were used to structure the themes and subthemes of the interview, such as feelings that the baby will be abnormal, that she will not be able to keep it, that she will die in childbirth, and feeling of being threatened by the possibility of a miscarriage (Raphael-Leff, 1991). This approach was chosen because these themes are frequently observed as common in spontaneous conception pregnancies, and thus would facilitate comparison of the two situations. Identified themes were discussed and agreed among the authors. In case of disagreement, another colleague validated the results.

Findings

Data relating to fears were grouped into four main themes: the baby's survival, the health of the baby, the efficacy of the mother, and the physical delivery of the baby. The first three themes were further divided into subthemes. Quotations are identified with the letter M followed by a participant number. Table 1 shows the percentages of women expressing fears within each subtheme. Frequencies of reported themes were examined separately for singleton and multiple pregnancies but no systematic differences were found (with the exception of preterm birth and delivery, as discussed below), so results are presented for the sample as a whole.

Table I. *Fears expressed by participants (n=19)**

Theme	%(n)
Baby's survival	
Inside womb	89% (17)
During delivery	58% (11)
After birth	16 % (3)
Health of the baby	
Disease	74% (14)
Malformation	37% (7)
Preterm	21% (4)
Efficacy of mother	
Engagement with mothering	26% (5)
Breastfeeding	16% (3)
Delivery	21% (4)

*Each woman may have answers grouped in more than one subtheme.

Baby's survival. This theme includes fears associated with the baby's basic survival, which were grouped into subthemes according to pregnancy stage: prenatal survival, survival during delivery, and survival after birth.

Prenatal survival. The most common fear expressed by almost all participants (89%) related to the baby´s survival before birth. Concerns about miscarriage in the beginning of pregnancy, and a feeling of a threat of a late fetal death during the last trimester, when the birth is already viable, were identified: *"A pregnancy is something normal but accidents may happen [...] as it is happening now with my placenta [placenta previa] (M4).* Living with this fear may have affected the way some women experienced pregnancy, making it hard for them

to believe their pregnancies would continue successfully: *"I am living each week as unique." (M7); "Then we spent this time [...] counting the weeks". (M10).*

Being very conscious of fetal movements was one way these women expressed their fear of losing the baby. Lack of movement was referred to: *"If he does not move, I think he is not ok." (M5); "I wake up and if he does not move [...] I worry about it" (M10).* It seemed that these mothers perceived the presence of movements as a signal that the baby was alive and consequently a way of relieving tension, as can be seen in one statement: *"Then, if he moves, even a little bit" (M5).*

Survival during delivery. Most of the women (58%), feared something devastating could happen to their babies during delivery: "*We know* [a child's death during delivery] *can happen, although it is rare* (*M4); "We listen to people talking about problems during delivery [...] sometimes the baby dies" (M11).* Unexpected events were mentioned, such as: *"I am afraid that he will get stuck" (M16).* Furthermore, doubts about the efficiency of doctors could be identified in some statements: *"Sometimes I have a fantasy that doctors will not find her to take her out" (M9).*

Survival after birth. A less frequently expressed fear (16%) but one still relevant to some expectant ART mothers was that the baby would not survive once born. Checking the baby's breathing was one of the monitoring strategies envisaged: *"Are they breathing?" (M15); "see if he is breathing [...] things like that" (M4).* One woman worried that something unpredictable and unexpected could happen: *"and the possibility of a sudden death" (M11).*

Health of the baby. This theme addresses concerns regarding the physical well-being of the baby. Statements were categorized into subthemes: disease, malformation, and prematurity.

Disease. This was the most frequently reported concern regarding the baby's health, mentioned by almost three quarters of the women (74%),. Some women referred to general illness : *"I am afraid he has something" (M10); "that he has any disease [...] (M4),* while others expressed specific concerns related to their own responsibility: *"as I had asthma, I am afraid he may have it too" (M9); "My diabetes does not allow her lungs to mature"(M11).* Wishing the baby would be born healthy without mentioning any specific concern was another way of expressing this: *"I hope he is born healthy" (M2; M14).* For one woman, even doing all the ultrasound tests was not enough to decrease her fear: *"I hope they are born healthy [...] because sometimes an exam cannot catch everything" (M8).* Conversely, one woman referred to concerns about the health of the baby as being expected during pregnancy: *"I guess all mothers have this concern" (M17).*

Malformation. Having a baby with any sort of congenital malformation was a fear expressed by just over a third of the participants (37%). For some, this involved anxiety about being the one responsible: *"I was afraid of catching rubella [...] sometimes when I went to hospital I saw those children [...] with malformation, with problems" (M1).* Women dealt with this by strategies such as doing ultrasound exams to decrease anxiety: *"I did a very good check up[...]indeed, I guess I exaggerated [...] many ultrasounds (M19)"; "I am worried about the organs [...] if they have them all" (M7).* One woman wished that the baby had already been born, to alleviate her concerns about malformation: *"I am curious to see his face, his body [...] see if everything is all right, that he is perfect, has no problems".* Another demonstrated resignation: "*even if she is born with some problem we will have to handle it" (M1).*For one woman, this fear was expressed by wishing her baby: *"be born perfect" (M13).*

Preterm. This subtheme, reported by just over a fifth of participants, refers to the fear of having a preterm birth (delivery prior to 37 weeks gestation) and having to cope with its

adverse consequences: *"I do not want him to be born early [...] it is not good neither for him nor for me" (M5)*.Women were worried about having to be separated from the baby: "*that she is born early [...] and has to stay in hospital" (M11).* For another participant, this issue was referenced by doubting if it would still be a problem for the baby to be born at that period of gestation: *"Now I think there is not a problem anymore*" (*M3).* Although this concern was less frequently expressed than others, these few women still felt threatened even during their third trimester, when fetal viability is generally improved. Furthermore, this fear was more common in multiple pregnancies (2 out of 4 women) than in singleton pregnancies (2 out of 15 women), reflecting a realistic view of the increased likelihood of preterm births for twins or triplets.

***Efficacy of mother*.** This theme addresses women's fears of not being a good enough mother, especially in relation to their ability to nurture and care for the baby. Concerns were grouped into two subthemes: engagement with mothering and breastfeeding.

Engagement with mothering. Just over a quarter of participants (26%) reported concerns regarding their own involvement as mothers in various ways, such as the fragility of their bodies: *"I take care of myself in a special way because it was IVF [...] I think it makes pregnancy more delicate, I guess"(M17).* Others referred to not being able to fall in love with the real baby once born: *"Am I going to fall in love with her as soon as I see her or is it going to take some time?"(M1)* or being able to empathise with the baby's needs: *"I am worried about [...] how am I going to know what his needs are in a certain moment?"(M13).*

Breastfeeding. Not being able to breastfeed was a fear expressed by few women (16%), but was important to those who did mention it: "*I am worried about not being able to breastfeed" (M18); "the only thing I am worried about is breastfeeding" (M11).*

***Delivery*.** Unlike the other themes, no subthemes could be identified here One woman mentioned being afraid of delivering as a typical maternal fear, although she was also scared of suffering during labour: *"now at the end [...] I am afraid [delivery] but I guess it is normal"*. Dying during a cesarean surgery was another's worry: *"I am afraid something happens to me [die] and she is left alone" (M9); "I hope everything goes right because it is going to be a cesarean [...] a high-risk one, a surgery" (M7).* As for preterm births, concern about delivery was more frequent in multiple pregnancies (2 out of 4, compared to 2 out of 15 singleton pregnancies), perhaps because delivery of more than one baby could indeed cause difficulties.

Discussion

The most commonly reported fear by women in this study was of the baby not surviving, which is also frequently expressed during the first gestational trimester by women who conceived spontaneously (Melender, Lauri, 1999). However, with spontaneous conception these fears usually recede after the 13th week of gestation when the pregnancy is felt to be secure (Raphael-Leff, 2001). Generally by the third trimester, when birth may be viable, expectant mothers focus on preparing for childbirth and parenthood (Shahoei et al., 2011), and much less on the baby's prenatal survival. In contrast, despite being into the third trimester and having undergone the recommended examinations, some ART women were still afraid of fetal death. Similarly, another study on ART mothers during the third trimester suggested that fear of losing the baby is more intense because their pregnancies are achieved in a context of grief and difficulties related to the treatment (Monti et al., 2008). Prenatal survival fears and ART were also associated in research conducted at the start of the second trimester, suggesting that previous experience of infertility may result in lingering anxiety during pregnancy (Hjelmsted et al., 2004) and make women intensely aware of the fragility

and uniqueness of new life (Repokari et al., 2006). The highly educated nature of the sample suggests that these concerns are not due to lack of prenatal knowledge. Interestingly, similar feelings are found at the end of the second, and the start of the third trimester among women with high-risk spontaneous pregnancy (Hatmaker, Kemp, 1998; Maloni, Kutil, 2000) whose reasonable perception of an anticipated loss may lead them to be focused on the health of the fetus (Hatmaker, Kemp, 1998), showing a special characteristic of pregnancy in this context (Monti et al. 2008). Thus, the current findings may reflect hyper-vigilance on the part of ART mothers due to increased anxiety, rather than actual fearfulness. However, ART mothers with singleton pregnancies reported fears about the baby's survival as frequently as those of multiple pregnancies (where the physical risk genuinely is higher) suggesting it is more than just a clear assessment of the concrete danger. This contrasts with previous research which showed that women with multiple pregnancies following ART may present with higher levels of anxiety than in singleton ART or spontaneous conception pregnancies (Glazebrook et al., 2000).

The suggestion is that the focus of ART mothers throughout pregnancy is affected by the experience of infertility (Hjelmsted et al., 2004), remaining on the potential risks facing this long desired baby. This is further supported by the ART women's perceptions of fetal movements. Research on spontaneous pregnancy during the third trimester found that mothers referred to movements as bringing a feeling of satisfaction and happiness (Shahoei et al., 2011) or as a way to reinforce their influence over the baby, i.e., the movements were a response to what the mother was feeling (Piccinini et al., 2004). In contrast, for the current sample, it was the absence of movement, rather than the presence, that mattered. This difference in emphasis, with the focus on the baby's survival rather than on the future baby, suggests potentially greater psychological vulnerability in ART pregnancies. In line with this,

Agostini et al. (2009) found a high level of anxiety among ART women during late pregnancy, which may relate to worries about a happy ending.

Unsurprisingly therefore, concerns with the health of the baby, which are common among women with spontaneous conception during pregnancy (Melender, Lauri, 1999; Piccinini et al., 2004; Tsui et al., 2006; Shahoei et al., 2011), were also referred to by the majority of participants of this study. Fear of disease may have been heightened by the ART treatment experience, increasing expectant mothers' awareness of a newborn's physical vulnerability (Repokari et al., 2006). Furthermore, some ART mothers were worried about a preterm birth despite the late stage of their pregnancy. Concern about prematurity is also common in high-risk spontaneous conception pregnancies (Hartmaker, Kemp, 1998), although it decreases among this group as pregnancy progresses. This fear may be realistic for both high-risk mothers and ART mothers where the probability of a preterm birth is increased relative to low-risk spontaneous conception pregnancies. According to REDLARA (2009), preterm deliveries (32-36 weeks gestation) following ART in Latin America occur with a frequency of 11% for singleton gestations; 55% for twins and 67% for triplets. Correspondingly, women with multiple pregnancies in the current study had an increased likelihood of trepidation regarding prematurity. From the perspective of mothers' fears, pregnancies after ART resemble high-risk pregnancies in some senses, since high-risk pregnant women are also afraid of miscarriage and the death of the baby (Hatmaker, Kemp, 1998) but are not identical, because the ART mothers retained concerns about prematurity for longer.

Staying with the focus on the baby's survival, some ART women in this study seemed more fixated on this than on mothering itself; that is, their concerns were not related to their future performance as a mother but on whether they would effectively achieve a successful

outcome to their pregnancies. Similar vulnerability was found in another study on ART during the third trimester (Monti et al., 2009) when women doubted if they were going to be able to carry on the pregnancy, suggesting that as well as their babies, they themselves felt as if they were fragile. Spontaneous conception mothers express fears about their efficacy as a mother in different ways, such as having problems with the child's care and rearing (Melender, 2002; Tsui et al., 2006). In comparison, expectant mothers in a high-risk pregnancy group during the last trimester, (Bielawska-Batorowicz, 1990) including women with cardiac problems or who had previously miscarried, refrained from valuing highly their attitudes towards motherhood due to their previous experience. Again resembling high-risk pregnancy mothers, the ART women in this study showed difficulties in considering motherhood, focusing their concerns on pregnancy, which could be seen as a psychological defence against a possible failure.

Regarding the baby's actual arrival, and contrary to research on spontaneous conception women (Tsui et al., 2006), fear of having a cesarean was not often cited by women in this study, maybe because due to high maternal age and possible complications of pregnancy (such as multiple births), these women almost take for granted they will be having this surgery. Being afraid of delivering is common among women with spontaneous conception (~~Raphael-Leff, 1991;~~ Melender, 2002; Sercekus, Okumus, 2009; Shahoei et al., 2011), and a comparison study of ART and spontaneous conception expectant mothers during the second trimester found that the two groups experience fear of delivering with the same frequency (Poikkeus et al., 2006). The relatively low reports of concerns about delivery in the current ART sample suggest that as mentioned above, these women are more preoccupied with the pregnancy itself and ensuring the baby survives to the point of delivery, and less with what happens subsequently.

Conclusion

The overall aim was to explore qualitatively the fears of pregnant women who had conceived through ART. The strengths were the study's focus, an infrequently researched topic, combined with a qualitative approach which makes it innovative, as well as contributing to knowledge about parenthood after ART. The main limitation is not considering the partner, since men can also experience a range of feelings during pregnancy. Other limitations include restricted generalisability due to the qualitative approach, and not having explored the relationship of the type of treatment the couple went through, and the cause and duration of infertility, with the fears reported.

The findings indicate that as well as sharing some fears seen in spontaneous pregnancy, women who conceived after ART express other more context-specific fears, with the most striking being fetal death. Some of these concerns are also found in high-risk pregnancies, where women perceive themselves as vulnerable, and their pregnancies as fragile. Being focused more on being able to keep the pregnancy may affect ART women's engagement with mothering and suggests that the effects of infertility linger, i.e., the baby's survival depends on the mother's body, which they perceive as not previously having worked as expected. Therefore, for some women the background of failure, challenges and feelings of incompetency in which conception was achieved, associated with their own psychological characteristics, may have caused fears that negatively affect their experience of pregnancy. This combination makes pregnancy after ART a special path to parenthood, in which expectant mothers need to be listened to and understood in order to help them to improve their psychological well-being and go through this process in a healthy way. For example, psychological support groups could be integrated within ART clinics, providing not only the expectant mothers but both members of the couple with opportunities to express their feelings

and beliefs, and to share expectations and concerns. The increased focus on the pregnancy seen in ART mothers suggests that such groups should also encourage the couple to think beyond the birth, and consider the future childhood and their own parenting. The findings of this study contribute to better understanding the transition to parenthood in this context and may help couples experience pregnancy and parenthood in a more realistic way.

Conflict of interest statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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