

Elective oocyte cryopreservation: who should pay?

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ABSTRACT: Despite the initial reactions of disapproval, more and more fertility clinics are now offering oocyte cryopreservation to healthy women in order to extend their reproductive options. However, so-called social freezing is not placed on an equal footing with 'regular' IVF treatments where public funding is concerned. In those countries or states where IVF patients receive a number of free cycles, we argue that fertilization and transfer cycles of women who proactively cryopreserved their oocytes should be covered. Moreover, when the argument of justice is consistently applied, coverage should also include the expenses of ovarian stimulation, oocyte retrieval and storage. Different modalities are possible: full coverage from the onset, reimbursement in cash or reimbursement in kind, by offering more free transfer cycles.

Key words: oocyte cryopreservation / social freezing / *in vitro* fertilization

Introduction

The possibility for women to cryopreserve oocytes in order to extend their reproductive options has gained momentum in recent years. In the first instance, fertility preservation was and is focused on people whose fertility is endangered by disease (for example Turner syndrome) or medical treatment (for example radiation or chemotherapy). The idea that techniques such as oocyte cryopreservation could be expanded to healthy women to prolong their reproductive lifespan originally sparked disapproval and was regarded by many as an unwelcome development (McCullough, 2004; Jones, 2009). However, as the vitrification technique moves from an experimental technique to an established procedure, arguments to withhold egg freezing from healthy women become increasingly unconvincing. This is all the more so as the realization grows that there is often a thin and arbitrary line between so-called medical freezing and so-called elective or social freezing. While acknowledging that the ethical debate on whether social freezing should be offered in the first place, is not yet settled, we will not reiterate the arguments pro and con as other authors have done this exercise and quite extensively so (Goold and Savulescu, 2009; Dondorp and De Wert, 2009; Rybak and Lieman, 2009). Rather, we start from the observation that fertility clinics in several countries, including the USA, the UK, Belgium, The Netherlands and Israel, do not find social freezing immoral and are now catering to women—usually highly educated, in their late 30s and single (Nekkebroeck *et al.*, 2010)—who have a strong desire to have children, have few fertile years ahead of them but are not ready to embark on parenthood just yet. This evolution has led to another morally contentious question, namely: who should pay for elective oocyte cryopreservation? 'Elective

freezing', 'non-medical freezing' or 'social freezing' (as opposed to 'medical freezing') is currently only available for women who are affluent enough to pay for the ovarian stimulation drugs, medical procedures, vitrification or slow freezing procedure and storage fees. Although the right to reproduce is widely recognized as a liberty-right, it is generally not regarded as a claim-right (Shanner, 1995). In the context of social freezing, this means that while women should have the liberty to cryopreserve their oocytes if they so wish, they cannot make claims on society to financially support their efforts to ward off infertility. However, many western countries have a healthcare system that covers a certain number of 'standard' IVF cycles to assure equal access to IVF technology and several US states mandate infertility insurance coverage. This indicates that, at least in those jurisdictions, the right to reasonable healthcare is extended to fertility treatment (ESHRE Task Force on Ethics and Law, 2008).

Should countries with publicly funded IVF extend coverage to social freezing?

If oocyte cryopreservation is an accepted procedure to counter infertility and if fertility treatment is covered by public healthcare, should the logical consequence then be that social freezing is also covered by public healthcare (or mandated insurance coverage) or is there a relevant distinction between 'regular' IVF and IVF with previously stored oocytes? The difficulty in making this assessment lies in the fact that elective oocyte freezing consists of two separate steps that are clearly distinct in time: first, ovarian stimulation, oocyte retrieval,

cryopreservation and storage and second (several years later), thawing and fertilization of the cryopreserved oocytes. At the time of the first step, women who request social freezing are healthy persons who ask for a procedure that results in stored oocytes that may or may not be used, depending on the further course of their lives. At the time of the second step, they are patients asking for a medical intervention.

A woman presenting at the fertility clinic asking for elective oocyte cryopreservation thus differs indeed from other IVF patients in a crucial manner: she is not infertile, which is in most countries a requirement to receive free IVF cycles. The term 'elective freezing' puts the focus on the idea that oocyte cryopreservation by healthy women resembles other instances of elective medical interventions—such as cosmetic surgery—that generally have no therapeutic benefit (unless psychologically). This sparks the sentiment that there is no reason why society should finance such 'whims' of women who want to have it all. However, while the line between medical and social interventions may serve as a general criterion to reimburse or not, there are many exceptions especially in the field of reproduction. Elective abortion, contraception and pregnancy care are prime examples (Harwood, 2009). Pregnancy is not a disease but we still consider abortion and pregnancy care as medical interventions worthy of reimbursement. Also in the field of medically assisted reproduction, numerous instances (lesbian couples, single women, gamete donation etc.) are hard to fit in a definition of 'medical'. Moreover, social freezing is not a procedure that is devoid of therapeutic benefits. Although it does not provide an instant remedy to a medical problem or prevent medical problems from occurring, it can be described as 'anticipatory' medicine: women anticipate on possible future problems by storing eggs. There is a possible therapeutic benefit, but instead of being instant, it is located in the future.

A woman presenting at the fertility clinic, requesting IVF treatment with her previously stored oocytes, does not differ from other IVF patients in any crucial manner. For those countries that provide women who are infertile due to advanced age with a number of free IVF cycles paid for by the healthcare system, it would seem straightforward that if these women's cycles are covered when they use their own fresh—but old—oocytes or donor oocytes, they should also be covered when they use their own cryopreserved oocytes. This does not only follow from the consistency requirement. At the time of use, the patient's own previously frozen oocytes have practical and ethical advantages compared with anonymous donor oocytes or the patient's 'fresh' oocytes, and their use should be encouraged. Compared with donor oocytes, there are no concerns over the welfare of the donor and the donor-conceived children. Compared with fresh but aged oocytes, the success rates and health prospects for the resulting babies are better, as a number of complications in children from (reproductively speaking) older mothers are related to the age of the oocyte, rather than to the age of the mother herself. If the two-tiered procedure of elective cryopreservation and IVF treatment is regarded as a whole, these arguments lead to the conclusion that it should be reimbursed according to the same standards as 'regular' IVF treatment. However, as both steps are distinct in time and as step one (storage) does not necessarily lead to step two (treatment), a more nuanced policy may be needed. We will consider the option of offering full coverage, but also the alternative options of offering a refund for the first step of the procedure on the condition that a woman returns for the second step, either in cash or in kind.

Full coverage

A first option would be to cover elective freezing from the onset, merely setting restrictions on factors such as the number of cycles and the woman's age (in light of a reasonable chance of pregnancy), similar to restrictions for regular IVF. This would lower the threshold for women to cryopreserve, make the option available to women with lower incomes and thus increase fair access. However, an implementation of this strategy would mean that the legal requirement in some countries of an infertility diagnosis prior to ovarian stimulation cannot be maintained.

A likely objection to full coverage is that this could be a suboptimal allocation of scarce funds. Health care budgets are strained and several countries are already struggling to accommodate the present IVF demand. At the same time, the added costs might not be overwhelming. Ovarian stimulation and oocyte retrieval are uncomfortable procedures that women will only undertake if they are convinced that they will actually benefit from the procedure. Moreover, if all women who have their oocytes frozen would use them later on, there would actually be a net benefit if one considers the costs per live birth. The reason behind this is that the live birth rate will be higher when (frozen-thawed) 'younger' eggs are used compared with 'older' eggs of subfertile women (Kim *et al.*, 2010), the miscarriage rate will be lower (Van Loendersloot *et al.*, 2010) and younger oocytes will lead to fewer chromosomal abnormalities in the offspring. Furthermore, women opting for social freezing will need fewer stimulation cycles at a younger age than they will need for regular IVF at an older age and there will be no need for stimulation of third party donors. 'Losses' are only made when cycles are performed for women who do not return for treatment and do not donate their oocytes to others. Van Loendersloot *et al.* (2011) have calculated that complete coverage is more cost-effective than the current practice as soon as 61% of women return for treatment (or donate their oocytes).

A key factor in establishing cost-effectiveness is to attract the category of women that is most likely to benefit from the procedure, meaning those who have a high chance of actually returning for treatment and whose oocytes are frozen at a point when they are still likely to lead to good fertilization rates. As we argue elsewhere (Mertes and Pennings, 2011), women who request cryopreservation of their oocytes between ages 30 and 35 are most likely to meet these criteria. In light of the lower success rates for 'older' women, a policy might be envisaged that offers full coverage to women younger than, for example, 36. Currently, most women who want to cryopreserve their oocytes present themselves too late, namely at an average reported age of 38 (Gold *et al.*, 2006; Klein *et al.*, 2006; Sage *et al.*, 2008; Nekkebroeck *et al.*, 2010).

Besides the cost-objection to full coverage, another objection might be that full coverage would lead to an increase of women opting for social freezing and to more women postponing motherhood. Whether the possibility of oocyte cryopreservation will cause a postponement of motherhood is debatable and will only be confirmed or refuted if and when elective freezing becomes widely available. One should always keep in mind, however, that when women choose to store oocytes and postpone motherhood, they do this because in their eyes, the circumstances for raising a child may or will be better at a later point in their lives than at the present. Thus, the possibility that more women will postpone motherhood is not a valid argument

against public funding, unless one starts from the premise that children are always better off being born to a young mother than to an older one, regardless of the circumstances. This is not a plausible premise. Most women who opt for social freezing postpone motherhood for lack of a partner (Nekkebroeck *et al.*, 2010). It is not particularly convincing to argue that it is better for these women to become single mothers at age 35 than sharing parenthood with a partner at age 40.

The fact that more women would be inclined to cryopreserve their oocytes at a young age can, in contrast, also be regarded as a desirable evolution in the sense that a greater number of the women who postpone motherhood will have young oocytes available to them and thus fewer will have to rely on donor oocytes. Another positive consequence on a societal level is that more donor oocytes will become available for those women who did not freeze proactively, as there will always be a certain percentage of women who store their oocytes but eventually do not return for IVF treatment. Moreover, this new source of donor oocytes would have fewer ethical objections attached to them, as one can be sure that the donor voluntarily underwent the ovarian stimulation and oocyte retrieval procedure. In fact, women who have taken the step to cryopreserve oocytes at one point, but have ultimately decided to remain childless or whose child wish has been fulfilled, have a perfect donor profile in yet another sense, as they realize how important a child wish can be, but at the same time no longer have an interest in using their oocytes themselves. Of course, in countries where donors are identifiable, it is important that women who donate when their cryostorage ends are warned that they may later be confronted with their genetic offspring. This, however, also applies to egg sharers and current oocyte donors.

Partial coverage

Another option is to cover only the second step of the procedure. In this scenario, the retrieval and storage of oocytes would be paid for by the woman herself, as she requests an elective procedure without immediate necessity. Oocyte thawing, fertilization and transfer cycles would be covered by the same principles of 'regular' IVF since the woman is at that point indiscernible from other IVF patients. The logic of this scheme is that health insurance only kicks in when a 'medical' problem (infertility) presents itself, and at that time the best treatment option is chosen: either IVF with fresh oocytes from the patient, IVF with donor oocytes or IVF with previously frozen oocytes from the patient. If the data on the health of children resulting from cryopreserved oocytes continue to be reassuring, the latter option is most likely to be the best option. When cryopreserved oocytes are already available, the patient does not require ovarian stimulation, she does not need to rely on donor oocytes and there is a smaller chance of chromosomal abnormalities in the offspring.

Although this solution is in line with current practice and appears to be logical, it is not fair toward the women who decide to freeze their oocytes. In hindsight, a woman who did not cryopreserve eggs at a younger age will be covered for both steps of the procedure, while a woman who was more foreseeing and decided to freeze her eggs beforehand is only covered for the second—and cheapest—step. Moreover, the former's procedure is likely to involve more risks for the resulting children and is less cost-effective.

Cash back

This unfairness could be corrected either by offering women a refund for the first step of their IVF treatment provided that they also undergo the second step and thus complete the procedure. As noted by Stoop (2010), 'it would be illogic not to reimburse these women when using their vitrified oocytes once they are faced with infertility while women of the same age get fresh IVF treatments fully covered'. The refund could either only cover ovarian stimulation and oocyte retrieval, or also include the costs related to storage.

This cash back-system appears to be the most straightforward and fair, but there are also some downsides to this approach. As the moment when a woman first pays for the retrieval and storage of her oocytes and the moment when she would be refunded are several years apart, the refund of several thousands of Euros/dollars will be experienced as a considerable financial 'bonus'. Whereas now, women only turn to IVF after trying to conceive naturally, they may be tempted to request IVF treatment with their previously cryopreserved oocytes (rather than trying to achieve a natural conception) for reasons of financial gain. At first sight, this appears to be a case of 'overuse' of medical resources. Demanding an infertility diagnosis before women can undergo covered IVF cycles and claim the refund is not a guarantee to prevent this. Infertility is not a disease that is easily diagnosed and often remains unexplained and clinically undetectable. The common definition of infertility is the absence of pregnancy after a year of regular unprotected intercourse, but it is impossible for a physician to check this criterion.

Moreover, it is not so clear whether the disadvantage of overuse of medical resources (in this case replacement cycles) would be justified in the given circumstances. Offering (frozen oocyte) replacement cycles to a 40-year woman whose ovarian reserve is not yet depleted appears less ethically challenging than pushing her to reproduce naturally with higher chances of miscarriage and chromosomal abnormalities in the resulting child while she has 'young' oocytes in storage.

More free transfer cycles

A final strategy might be not to offer a refund in cash for women who request IVF treatment with previously frozen oocytes, but to offer them a refund in kind, more specifically a number of additional transfer cycles. The cost of thawing, fertilization and transfer of the embryo is considerably lower than the cost of a full IVF cycle and thus many more replacement cycles can be offered for the same price. In this kind of arrangement, women are not financially motivated to undergo IVF while they are still fertile. A practical disadvantage of this scheme is that coverage is generally calculated per stimulation cycle, not per transfer cycle. One would need to compare the total cost of an IVF cycle (which usually includes several replacement cycles for fresh and thawed oocytes or embryos) to the cost of thawing, fertilization and replacement in order to determine how many transfer cycles would equal the price of an average full IVF cycle.

In countries that already cover several IVF cycles, this arrangement loses a lot of its appeal as women who opt for elective freezing are unlikely to need these 'extra' transfer cycles. Still, although there is no perfect equality of both groups (IVF patients of advanced age with or without previously cryopreserved oocytes), there is at least an attempt to limit the inequality.

Which strategy is most sound?

Of the four strategies that we discussed, the one that presents the biggest challenge to the values of justice and equality is partial funding, which is in fact common practice at present. From the proposed alternatives, the cash back-system is expected to be the most appealing one as it is cost-effective, no public money is 'wasted' on unnecessary medical procedures, it is compatible with the widespread legal requirement that IVF cycles are only covered when there is a diagnose of infertility and it is fair when comparing women faced with age-related infertility who did previously cryopreserve their oocytes to those who did not. However, it is not a fair system when one compares women who freeze and return for treatment to those who do not return. We might imagine two single women who freeze their eggs at the age of 34, hoping to find a suitable partner soon, rather than having to decide to have children either alone or with an unsuitable partner. One finds a partner to share parenthood with and returns for treatment at the age of 38, while the other remains single, does not want to be a single mother and therefore does not return for treatment. Only the first woman will be reimbursed, although there is no morally relevant reason that sets her apart from the second, other than that she was more lucky. As such, the second woman actually suffers a 'double loss'.

Whether the fourth strategy (extra transfer cycles) offers an actual advantage or not will depend largely on the local context. In Belgium, for example, six IVF cycles are covered by public health insurance. Taking into consideration that each of these six started cycles represents several transfer cycles, it is very unlikely that patients would benefit from extra cycles. In places where only one or two cycles are free of charge, however, extra free replacement cycles will often be useful.

Also, the appeal of the first strategy—full coverage—will depend on local factors. While it is a fair system that would improve success rates for women treated for age-onset infertility, the public healthcare system probably will not want to add women who request social freezing to the waiting lists of women who are already subfertile and who are sure to want IVF treatment. In countries where there are no waiting lists, however, full coverage up to a certain age might act as an incentive for women to freeze their eggs at a time when they are still sufficiently fertile, rather than at a time when they become desperate.

On a policy level, a systematic analysis of these local legal and contextual factors should be undertaken in order to determine which strategy is the most 'fair' for all parties involved, given the local context. Even a combination of several policies might be envisaged. For example, for a country such as Belgium, we could imagine a system in which women who cryopreserve their oocytes before the age of 36 are covered in full, while women who cryopreserve their oocytes at a higher age would only be covered for fertilization and transfer. Such a policy may be justified based on a trade-off between considerations regarding equity of access, cost-effectiveness and public education (namely: that oocyte freezing is best done before the age of 36). In the UK, in contrast, a system that offers more free transfer cycles might be the better choice when there are already many infertile couples on the waiting lists.

Conclusion

Although elective oocyte cryopreservation—better known as social egg freezing—is being offered by an increasing number of fertility clinics, it is far from clear what its place is—or should be—within systems that offer a number of free IVF cycles. If women who have proactively cryopreserved their oocytes return for treatment at a point when they can no longer conceive naturally and have not reached the maximum age limit for embryo transfer, they should be treated on equal terms with other IVF patients and also receive free treatment. It is less straightforward, however, whether or not the covered cycles should include the first step of the procedure, namely the costs related to ovarian stimulation, oocyte retrieval, oocyte freezing (vitrification) and storage. Although paying for elective procedures is counterintuitive, there are good reasons to argue for full coverage from the onset. Alternatively, a cash back-system or more free transfer cycles could be considered. The preferred strategy will often depend on local legal and contextual factors.

Authors' roles

H.M. performed the literature research, drafted the manuscript and approved the final version for publication. G.P. critically revised the manuscript for important intellectual content and approved the final version for publication.

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