

Should obese women's access to assisted fertility treatment be limited? – A scientific and ethical analysis.

Short title: Should obese women have fertility treatment?

Key words: obesity, IVF, ethics, access to treatment, assisted reproduction

Abstract: 240 words

Manuscript: 2366 words

Abstract

Obesity is associated with a reduction in fertility treatment success and increased risks to mother and child. Therefore College guidelines suggest that a BMI exceeding 35 kg/m² should be an absolute contraindication to assisted fertility treatment such as IVF. In this paper we challenge the ethical and scientific basis for such a ban. Livebirth rates for severely obese women are reduced by up to 30%, but this result is still far better than that observed for many older women who are allowed access to IVF. This prohibition is particularly unjust when IVF is the only treatment capable of producing a pregnancy, such as bilateral tubal blockage or severe male factor infertility. Furthermore, the absolute magnitude of risks to mother or child is relatively small, and while a woman has a right to be educated about these risks, she alone should be allowed to make a decision on proceeding with treatment. We do not prohibit adults from engaging in dangerous sports, nor do we force parents to vaccinate their children, despite the risks. Similarly, we should not prohibit obese women from becoming parents because of increased risk to themselves or their child. Finally, prohibiting obese women's access to IVF to prevent potential harms such as "fetal programing" is questionable, especially when compared to that child never being born at all. As such, we believe the College ban on severely obese women's access to ART treatment is unwarranted and should be revised.

Introduction.

Obesity is a rapidly growing phenomenon with 27.5% of Australian adults being obese ($\text{BMI} \geq 30 \text{ kg/m}^2$) and 10% morbidly obese ($\text{BMI} \geq 35 \text{ kg/m}^2$)¹. Similarly, 30% of the New Zealand adult population is obese, with 15% being morbidly obese.² The incidence of extreme obesity is especially high within Aboriginal, Maori and Pacific Islanders population, with rates of morbid obesity being 2-4 fold higher than the Caucasian population.^{1, 2}

Obesity is associated with a myriad of obstetric complications and risks³. In response to these concerns the RANZCOG policy on assisted reproduction states, “A Body Mass Index (BMI) greater than or equal to 35 is a recognised risk factor in pregnancy and delivery and should be regarded as a contraindication to assisted fertility”⁴. While discretion for accessing treatment is ultimately left to the treating doctor, this policy does create a significant barrier for morbidly obese women accessing ART. Furthermore, the New Zealand government has gone further and adopted a policy⁵ limiting access to public funding for IVF to women with a BMI under 32 kg/m^2 . The purpose of this paper is to discuss the scientific and ethical merits of these policies.

Arguments supporting restriction of morbidly obese women’s access to ART.

Proponents of policies preventing severely obese women from accessing ART generally cite three broad reasons for this position.

1. Cost effectiveness

Governments typically target health funding to those areas that will provide maximal benefit. Therefore the New Zealand government decided to limit public funding of IVF to women with a BMI below 32 kg/m^2 , since live birth rates are lower in obese women compared to their lean and overweight age matched counterparts⁵⁻⁷. Furthermore, evidence

suggests that weight loss may trigger spontaneous ovulation in obese patients with PolyCystic Ovarian Syndrome (PCOS),^{8,9} potentially negating the need for fertility treatment.

2. Obstetric risks in obese women

Obesity is associated with an increased risk of miscarriage and a myriad of later pregnancy complications such as gestational diabetes, pre-eclampsia, preterm birth, instrumental and operative delivery, thromboembolism and post-partum haemorrhage.^{3, 6, 10, 11} All of these complications pose risks to the mother and her baby, plus additional costs to the health budget, and therefore many suggest that it is unwise to embark on fertility treatment in this context.

3. Risks to the child's health

Children born to obese mothers have an increased rate of congenital abnormalities such as neural tube defects, cardiac septal defects and cleft palate.³ Furthermore babies born to obese women, especially those with gestational diabetes, are likely to be macrosomic and at increased risk of serious complications relating to shoulder dystocia, plus admission to neonatal nursery for management of respiratory and metabolic issues.³ Finally, maternal obesity may result in “fetal programming” that may have long term negative consequences (hypertension, diabetes, obesity) for that child in adult life.^{6, 12} Therefore many commentators suggest that it is unwise to embark on fertility treatment in an obese woman where you may create a child with long term health impairment⁶.

Critique of the arguments supporting restricting access to ART for obese women.

We would like to examine each of the proposed arguments preventing obese women's access to ART, both from a scientific and ethical perspective.

1. IVF in obese women is not an effective use of resources.

While obesity does reduce a woman's chances of having a child from IVF treatment, the magnitude of this reduction is relatively minor. Analysis of outcomes from a quarter of a million cycles of IVF in North America⁷ (SART database) shown that live birth rates in morbidly obese women (BMI 35-39.9 Kg/m²) are 26.3 % per cycle, compared to 31.4 % for lean women (BMI 18.5-24.9 kg/m²) – an relative reduction of only 16%. Even in the most extreme cases (BMI > 50 kg/m²) the live birth rate is still a respectable 21.2%, or one-third less than lean individuals (Figure 1). While it is preferable that all obese women lose weight to maximise IVF efficiency, these figures certainly do not suggest that IVF treatment in the obese woman is futile. Indeed, one could argue from the ethical principle of consistency that we would be required to withdraw all public funding of IVF treatment for women older than 30 years of age if we are only going to support maximal efficiency outcomes (Figure 2)¹³. Certainly the distributive justice argument for not supporting IVF for women older than 43 years of age, a time when IVF treatment does border on futile, is much more valid than withholding IVF treatment for young obese women. Surprisingly however, neither Australian Government or RANZCOG policy prohibits IVF treatment of these extremely poor prognosis older patients. Furthermore, these types of distributive justice arguments cannot be used if the woman is funding her own treatment, yet the college statement makes no distinction between public and privately funded IVF.

2. Obese women should be made to lose weight to allow for natural conception

Several studies have confirmed that weight loss is an effective means of initiating ovulation and natural conception in PCOS^{8,9}. Therefore for the obese young woman with PCOS it is entirely reasonable to promote weight loss as a first line fertility treatment. However, as detailed below, the scientific arguments supporting mandating weight loss before access to IVF are not as strong when the woman is already ovulating, has infertility

that can only be treated by IVF (tubal or severe male factor infertility) or has limited time due to advanced maternal age.

3. Mandated weight loss will improve chances of ART success

There is limited evidence showing that mandating weight loss prior to IVF results in improvements in treatment outcomes. A recent RCT of lifestyle modification through diet and exercise for a 6 months before accessing ART reported no significant benefit in terms of ART conception rates, obstetric complications or neonatal outcomes.⁸ Furthermore, despite intensive support, 21% of participants withdrew from the trial before completion, and an average of only 4.4 kg was lost. While it is possible that larger weight losses may have resulted in superior ART conception rates and pregnancy outcomes, the reality is that such relatively small amounts of weight loss are common in clinical practice. Furthermore, several other studies have also failed to report any positive benefit of weight loss prior to commencing IVF treatment in ovular women.^{9, 14, 15}

An obese woman can achieve a weight-loss of 0.5 kg per week if they adopt a caloric deficit diet of between 500 and 1000 kcal/day- an approximate 20-40% reduction in calories.¹⁶ If we consider the hypothetical example of Mary, a woman with a BMI of 45 kg/m² (height 1.6 m, weight 115kg), she would need at least 12 months (26kg) to reduce her weight to reach the RANZCOG threshold for IVF treatment, or 17 months (34 kg) to access publically funded IVF in New Zealand. If Mary is 28 years of age with good ovarian reserve this plan may be reasonable as time is on Mary's side. However if Mary is 39, delaying IVF treatment for 12-17 months will result in 20-30% decline in live-birth rates due to increasing age (Figure 2), a decline unlikely to be nullified by any fertility improvements mediated by weight loss⁶. Furthermore, as the vast majority of obese women do not sustain these large

amounts of weight loss^{8, 9, 14, 15}, mandated attempts at weight loss before ART are even less likely to result in any net fertility benefit.

An alternative approach to achieve weight loss is bariatric surgery which has been shown to result in potentially massive weight losses and is now advocated by some professional societies as a best practice option for the morbidly obese with comorbidities such as diabetes.^{17, 18} However the benefits of bariatric surgery are often unclear for women seeking fertility since it is generally advised that pregnancy should be delayed for 18-24 months to allow for maximal weight loss.^{17, 19} However this two year delay may produce a critical reduction in ART pregnancy potential. For example, a 39 year old woman who delays her IVF treatment for 2 years after bariatric surgery will reduce her pregnancy rate by nearly 50% (10% to 5% live birth rate)(Figure 2), a decline unlikely to be offset by potential benefits from weight loss.

Advocates of pre-conception bariatric surgery also need to consider the potential harms to mother and child. Mortality rates from complications of surgery are estimated as 1 in 500 in the metabolically healthy obese women, and may exceed 1% in the morbidly obese patient with co-morbidities.¹⁸ Furthermore, bariatric surgery increases the risk of intra-uterine growth restriction (IUGR),^{19, 20} a disorder known to potentially produce fetal programming and adult onset disease¹², plus increase the risk of stillbirth and neonatal death^{19, 20}. As such, the merits of pre-conception bariatric surgery are debatable.

4. Mandating weight loss before ART avoids harm to the woman

The ethical principle of non-maleficence- “*primum non nocere*” (first do no harm), plays a significant role in medical care⁶. As a result many doctors consider it difficult to embark on fertility treatment that may result in a high risk pregnancy that could compromise a woman’s health, or even result in her death. However, a recent review of maternal deaths in

the UK reported that obesity *per se* does not significantly increase maternal mortality, but rather the presence of medical comorbidities is a risk factor for death ²¹. Therefore the obese woman with no medical co-morbidities may be at little or no increased risk of death during pregnancy. Secondly, a recent meta-analysis has reported no significant association between being overweight and complications arising from IVF treatment ²². As such, it can be argued that the maternal risks posed by IVF and pregnancy in obese women have often been overstated.

It is often forgotten that refusing fertility treatment may itself create harm. Many obese women have low self-esteem and high rates of anxiety and depression. ^{23, 24}, with refusal of access to IVF treatment likely to further harm their mental health.²³ Prolonged infertility and failure to achieve a desired pregnancy has also been reported to have very serious long term health impacts for a woman, including a doubling in the risk of suicide, ^{25, 26}.

We believe that it is unjustified to block obese women's access to ART on the basis of preventing potential adverse outcomes. Pregnancy is one of the most dangerous events in a young woman's life, even when she is fit and healthy, yet society accepts that some risk must be accepted in order to achieve motherhood. While the absolute risk of death or permanent disability may be increased in obesity, it is still low, and the final decision to undertake that risk should be the woman's, not her doctors. Autonomous adults should be allowed to make decisions on what risk they are prepared to take, balancing the potential upsides (becoming a mother) with risks. Some women may regard these risks as too great and choose to defer or avoid pregnancy. Others will regard the risks as acceptable. The role of the doctor is to educate the women regarding the absolute magnitude of these risks, in the context of that individual's health status, and outline how these risks may be reduced by preconception weight loss.

5. Mandating weight loss before ART will improve health outcomes for the child

Maternal obesity is known to increase the risk of congenital anomalies in the child; with metabolic disorders such as diabetes and hyperhomocysteinemia increasing that risk.³ However, it is estimated that as many as one-third of morbidly obese women are metabolically healthy.²⁷, with recent studies suggesting that these women have only a marginally increased risk of having a child with a congenital abnormality (OR 1.16, CI 1.04-1.29)²⁸ As such, we would suggest that the college statement makes reference to the metabolic health of obese women, not merely their BMI, when deciding on delaying access to ART. Furthermore, since both infertility and IVF are known risk factors for congenital abnormalities and adverse perinatal outcomes irrespective of maternal BMI²⁹, one can also argue that only prohibiting obese women from accessing IVF is both discriminatory and unfair.

The argument that we should ban ART treatment in obese women to prevent fetal programming issues in later life is weak since studies have not proven that a significant proportion of children born to obese mothers will become diabetic or hypertensive, irrespective of these children's own lifestyle choices. Furthermore, diabetes and hypertension are able to be treated, with most individuals still leading long and productive lives. Even if a child were to be affected by fetal programming, it is hard to mount a convincing argument that a child is harmed more by conditions that materialise in middle-age and are treatable, compared to not being born at all³⁰.

In many aspects of life, our society allows parents considerable leeway in relation to the risks that are acceptable in relation to their children's health. For example, we do not force parents to immunise their children, despite clear health advantages. Within acceptable boundaries, society does not mandate that parenting style must adopt a path of zero or

minimal risk. As maternal obesity has not been shown to result in a high risk of serious harm to the child⁶, we should accept that severely obese women have a right to become parents, even if that may slightly increase health risks for their children.

Conclusion

We support the principle, outlined in the RANZCOG statement⁴, that doctors should encourage morbidly obese women to initially attempt weight loss before undertaking ART treatment. However a universal ban on severely obese women accessing ART is inappropriate as it does not allow doctors to consider other important aspects such as the metabolic health of their patient, co-morbidities, maternal age, underlying cause of infertility and past success with weight loss attempts. We have outlined in Figure 3 what we believe to be an appropriate clinical pathway for the management of the obese women seeking pregnancy assistance which considers all of these relevant factors.

The current policy blocking obese women's access to ART is unfair as it disadvantages women of low socio-economic status and indigenous background, both who are significantly over represented in the morbidly obese population^{1, 2}. These women often struggle to access healthy food, supervised diets and exercise, plus other treatment options such as bariatric surgery. Furthermore, the NZ government's position blocking obese women's access to publically funded IVF is in our view discriminatory, and should be reconsidered. Furthermore, it is not justifiable to withhold IVF from obese women because of a slightly less than optimal success rate, as the efficiency of IVF treatment in this obese group is far superior to that seen for women in their 40's who are not prohibited from accessing IVF in Australia.

Unfortunately many doctors blame obese patients for their own predicament, often labelling them as "lazy, undisciplined and lacking willpower."^{23, 31} They are believed to be

responsible for their predicament, and responsible for putting themselves on a better reproductive footing. With such powerful negative perceptions it is easy for doctors to justify their denial of fertility treatment as both medically and morally justified. However, obesity needs to be seen as an illness, with complex mental and social interactions, and not simply dismissed as an end result of poor self-control and lack of responsibility. We do not deny women with obesity related diabetes or hypertension effective medical treatment. Why then should we deny obese women access to assisted reproductive care, especially if that is their only chance of becoming a parent?

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Tables and Figures

Figure 1. The influence of maternal BMI on autologous oocyte IVF live birth rates from the North American Society for Assisted Reproductive Technology (SART) database 2008-2010. Reference 7.

Figure 2. Live birth deliveries per initiated autologous oocyte derived fresh embryo transfer in Australia and New Zealand 2013. Reference 13.

Figure 3. Treatment protocol for obese women seeking fertility treatment assistance.