Commentary of "The Use of Mitochondrial Replacement in IVF: A Call for Expansion"

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https://doi.org/10.7916/vib.v1i.6508

by Lillian Ringel •

Briana's op-ed calling for expansion of mitochondrial DNA replacement in IVF was an interesting read. She starts her op-ed with a description of what mitochondrial DNA is, and though it may seem rudimentary to some, since I have a very basic understanding of biology I found this paragraph essential to my comprehension of her argument. In general, the piece is well organized, and easy to follow.

That said, I wish Briana had expanded on a few of her interesting points. One example is when she describes potential abuses of mitochondrial DNA replacement therapy. She could have made this point even stronger by adding – after she writes, "[mitochondrial replacement] simply replaces one set of mitochondrial DNA for a non-infected set," – a statement indicating that moreover, "the non-infected set gives children the chance to live normal lives." I think this would have driven her point home.

Throughout, Briana does a great job of highlighting opponents' potential arguments to mitochondrial replacement. Given the limited length of this assignment, she goes both as broad and as in-depth as possible into examining and refuting her opponents' arguments. However, if she has the chance to expand this essay in the future, I would like to read more about what the ethical implications are given that the United Kingdom currently has a monopoly on mitochondrial replacement therapy. Moreover, if mitochondrial DNA replacement were available in more countries than just the U.K., I would like her to explore who the potential women would be to receive testing. As it is, IVF – to say nothing of determining which women carry mutated mitochondrial DNA – is expensive and, to my knowledge, more or less limited to relatively wealthy people in developed nations. Thus, I wonder what ramifications, if any, mitochondrial DNA replacement therapy would have if it expanded outside of the U.K. Would we have to first ensure that all women who demonstrate need have affordable access to IVF? Perhaps these are points to consider in a longer paper.

Overall, I appreciated Briana's confrontation of a complex topic. Her writing flowed well, and I would be very interested to read any expansion of this op-ed that she writes.

by Amy Scharf

Briana makes some excellent arguments in favor of expanding the practice of mitochondrial replacement prior to IVF. I agree that, ethically, the replacement seems to meet the standards of autonomy when both parents agree to the procedure. The embryo clearly cannot decide its fate, and in nearly all medical and legal cases, it is the responsibility of the parents (or legal guardian) to make the medical decisions for its minor children. In the case of mitochondrial replacement, the parents are choosing a medical intervention in order to avert a serious genetic disorder that could result in pain, suffering, and even premature death of their child. On the flip side, we must also keep in mind that it is within the parents' rights to forego mitochondrial testing and replacement.

In terms of the ethical principle of justice as it relates to accessibility of this technology, I agree with Briana that for this to be a "just" medical procedure, it should be more universally available. However, I do not foresee this occurring any time soon. Currently this is a "first world" procedure. For prospective parents to even reach the point where they are considering IVF, let alone embryonic genetic testing and mitochondrial replacement, they will have already likely spent tens of thousands of dollars on fertility treatments and specialists, the majority of which are usually not reimbursed by health insurance. The costs, not to mention the limited availability of the procedure, make it one that will be inaccessible to most parents for years to come.

An ethical and potentially legal issue that Briana did not address is that of the genetic "maternity" of the child. If an embryo contains DNA from TWO different mothers, then does the child then have two biological and/or legal mothers? In the US, laws and precedents exist that codify parental rights in cases of donated eggs, sperm, and surrogate mothers, and similar laws will have to be applied to the mitochondrial DNA donations. However, this presents a unique case in which a human being possesses the DNA from three separate parents. Medically, I am also interested in the long-term effects of this: how do the different DNA's "relate" to each other as they reproduce for future generations? Would genetic testing of future generations be able to discern the differences? This relates to the bioethical tenet of non-maleficence, or “do no harm,” which may not fully realized in this case. What are the medical and genetic ramifications of mitochondrial replacement for future generations? What are the genetic repercussions of introducing a third “parent’s” DNA into an embryo?

I would also like to learn more about the reasons why this procedure is only available in Great Britain. Is it undergoing the testing or approval processes in other countries, or has the medical community outside Great Britain deemed this an untenable and/or medically unethical procedure?

Despite these reservations, I do agree with Briana that the benefits of mitochondrial replacement appear to outweigh its risks, and that ethically, once further research has found it safe, it is a procedure that should be made more available to vulnerable patients.