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Letter

Oocyte spindle transfer for prevention of mitochodrial disease: the question of membrane fusion technique

To the Editor

I read with interest the report on the live birth after oocyte spindle transfer recently published in *RBMOnline* (Zhang et al., 2017). I wish to congratulate the authors on this important breakthrough in the prevention of the transmission of mitochondrial disease. As presented, however, the article has a number of weaknesses and limitations in a number of areas, as also pointed out in the accompanying Editorial (Alikani et al., 2017). This letter is focused on one of them – the method of membrane fusion used for spindle transfer. Zhang et al. (2017) used electrofusion, a technique known to produce premature activation of human oocytes (Cohen et al., 1998), a condition suspected to be at the origin of embryo aneuploidy (Paull et al., 2013). In fact, three out of four blastocysts obtained from reconstituted oocytes in the report by Zhang et al. (2017) were aneuploid.

In the first scientifically documented experimental work on spindle transfer between mature human oocytes (Tesarik et al., 2000), which was not cited in the paper by Zhang et al. (2017), two methods that avoided premature oocyte activation were used. Fusion between a karyoplast and an enucleated oocyte was achieved either chemically, with polyethylene glycol, or by mechanical manipulation. Both methods resulted in a low degree of spontaneous oocyte activation and a high capacity of the reconstructed oocytes to undergo subsequent calcium-induced activation (Tesarik et al., 2000). It is evident that the optimal methodology of spindle transfer for mitochondrial replacement therapy is far from being established, and future research is urgently needed.

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