Mitochondrial replacement therapy and ‘three-parent children’—who should be registered as the legal parents?

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The UK has become the first country in the world to authorise a licence for mitochondrial replacement therapy (MRT). This Human Fertilization and Embryology Authority (HFEA) landmark ruling, made in December 2016, will allow children to be born with DNA from three parents. MRT creates embryos containing the nuclear DNA from a couple, with healthy mitochondrial DNA from a female donor. MRT was developed in the UK, but the first successful pregnancy was reported in Mexico (https://www.newscientist.com/article/2107219-exclusive-worlds-first-baby-born-with-new-3-parent-technique). Mitochondrial DNA mutation is transmitted along the maternal lineage, affecting about 1,200 babies and 2,500 women in Britain, and about 800 babies in the USA. It causes severe disabilities and premature death.

The ethics of MRT, pre-implantation therapy, selective reproduction (selecting out mutated genes) versus embryo modification (treatment and replacement of defective genes) have been discussed extensively (World Congress on Bioethics 2014, Bioworks 763). Opponents of MRT argued strongly against creating ‘designer babies’ and against germline gene manipulation, which affects subsequent generations. Proponents vigorously defended MRT, stating that it replaces only 37 genes (0.1% of the adult genome), which perform separate functions from the 23,000 genes that dictate our personality and main features.

Who should be the legally registered parents for children with three parents remains controversial. The doctrine that ‘mater semper certa est’ (the birth mother is definitely always the mother) was successfully challenged in the Irish High Court in a gestational surrogacy case, and the commissioning mother was granted permission to sign the birth certificate as ‘the mother’ because of her genetic relationship to the child (MR & Anor v An Tard Chla raith eoir and Others [2013] IEHC). Gestational surrogacy and MRT results in children having three parents, and although the commissioning mother contributes the overwhelming majority of the maternal genetic contribution, the proposition that she should be registered as ‘the mother’ has not yet been tested in law. Only MRT allows couples to produce a genetically related child without the mitochondrial disorder carried by the commissioning mother but the contribution of the surrogate mother is considerably more than the epigenetic influences of a surrogate mother, who does not provide the donor egg cytoplasm or mitochondrial DNA. Although the UK was the first country to introduce legislation on surrogacy (Surrogacy Agreement Act 1985), this has only progressed slowly in a reactive manner as Courts issue judgements after delivery, thereby establishing precedents (Mason J and Laurie G. Law. Medical Ethics (2010)). Surrogacy was similarly controversial when it was introduced in the UK (Warnock Report 1984). The HFEA Parenteral Election Form addresses parental rights, as it allows the commissioning mother to sign the birth certificate and to nominate a man other than the biological father as the legal father (HFEA Code of Practice 2013), but in the UK a surrogacy agreement is not legally binding. Moreover, the HFEA Act 2008 section 33 dictates that at the time of birth the surrogate is the legal mother, and section 54 only grants a parental order to commissioning couples after the birth has taken place. In contrast, in the USA, the Uniform Parental Act 2002 Article 8 give individual States the option to transfer parental rights to the commissioning parents before delivery. It states that the woman who carries a child to birth pursuant to a gestational agreement is not the legal mother. The US courts must validate and enforce a gestational agreement once all parties have consented. The UK courts have not yet been tested on a MRT case, but HFEA legislation applies for intravenous fertilisation pregnancies. Irrespective of ethical debates questioning procreation at all cost, and the utilitarianist’s view of sacrificing the good of a few for the benefit of many, the best interests of the child must remain paramount, but how this is best achieved is still the subject of controversy.

Disclosure of interests
None declared. Completed disclosure of interests form available to view online as supporting information.