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Hope for childhood cancer patients of regaining fertility

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A MONKEY left infertile after undergoing chemotherapy as a juvenile has fathered an infant because scientists froze its testicular tissue before treatment, then re-grew it after the animal reached adulthood.

It is the first time that the technique has been proven to work in primates and offers hope that childhood cancer patients can preserve their fertility.

Adult cancer patients have the option of banking their sperm but for boys their reproductive tissue does not start producing sperm until puberty, so there is nothing to save.

As a result, one in three childhood cancer survivors suffers infertility from harsh cancer treatment.

Scientists at the University of Pittsburgh cryopreserved the immature testicular tissue of five young rhesus monkeys that had not undergone puberty, before giving them chemotherapy.

They later thawed and transplanted the pieces of tissue under the skin of the same animal, and when they entered puberty, eight to 12 months later, the grafts were removed and sperm was found to be present.

The sperm was then used to fertilise 138 eggs, 41 per

cent of which developed into early-stage embryos and 11 were transferred into female monkeys.

Last April, a female was born from the study and named Grady - a portmanteau of "graft-derived" and "baby" - which has remained healthy.

"With Grady's birth, we were able to show proof-of-principle that we can cryopreserve pre-pubertal testicular tissue, and later use it to restore fertility as an adult," said author Dr ADETUNJI Fayomi, of Pittsburgh's School of Medicine.

"Previous research in non-human primates has demonstrated that sperm

Young cancer patients around the world may get a chance at having a family in the future'

could be produced from transplants of frozen prepubertal testicular tissue, but the ability to produce a healthy live offspring - the gold standard of any reproductive technology - has not been achieved until now."

In the UK, one in every 500 under-15s develops a cancer and about 1,600 children are diagnosed with cancer each year.

Girls are born with their

eggs, which can be preserved, but boys are not born with mature sperm. Instead, hormonal changes during puberty lead to an increase in testosterone which activates sperm-inducing stem cells.

But chemotherapy, radiation or other medical treatments can kill these stem cells and cause permanent infertility.

The researchers said that proof that the technique worked in primates was the final step before moving to trials in humans.

"This advance is an important step towards offering young cancer patients around the world a chance at having a family in the future," said the study's senior author Dr Kyle Orwig, professor of obstetrics, gynaecology and reproductive sciences at the School of Medicine.

"Having produced a live-born and healthy baby, we feel that this is a technology that is ready to be tested in the clinic."

The team were so confident that the technique would one day prove successful that they have been cryopreserving testicular tissue from childhood cancer patients since 2010.

Dr Orwig said he hoped that when those patients grew up and wanted families of their own, the option would be ready to help them.