Gene Editing in a Human Embryo – II

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Why in news?

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A Chinese academic recently claimed that he had successfully created the world's first genetically-edited babies.

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What is his research on?

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- The researcher worked with seven volunteered couples, wherein each couple had one partner who was HIV-positive.
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- The aim was to ensure that HIV is not transmitted to the child.
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- He used the Crispr Cas9 technology, which works like a genetic cut-and-paste tool,that allows researchers to permanently modify genes in living cells and organisms.
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- Under the technology, he edited the genomes of 16 embryos to disable a gene, CCR5, which allows HIV to infect cells.
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- He then used the in-vitro fertilisation (IVF) technique to implant edited embryos, that lead to the birth of genetically edited babies.
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- The changes so made are inheritable and passed on to descendants.
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What are the concerns?

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- **Complications** - Modifying the DNA of an embryo to create a "designer" baby may have many consequences, including long-term ones affecting the species.
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- In this case, disabling of the CCR5 gene is known to lead to higher risks such as heightened susceptibility to flu.
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- **Targeting** - The Crispr Cas9 technique is also controversial because it is known to cause damage by "off-target editing" that damages untargeted genes.
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- Since the changes are inheritable, the gene-edited babiesmay even have to forego having children, if any negative genetic traits are witnessed in the course of their life.
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- **Population composition** - Genetic editing in humans with customised traits could empower eugenicists and racists, thereby encouraging selective breeding of the human population by eliminating undesirable traits.
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- **Regulation** - Gene editing is banned in most countries, including China.
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- In the UK, where gene editing of embryos is permitted only after strict regulatory approval.
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- Hence, many people from the scientific community have asked for a moratorium on editing human embryos.
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- The scientific, commercial and ethical implications of this technique have to be researched further before getting it implemented on a large scale.
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Source: Business Standard

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