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Q6(b)

How are the cases of disputed paternity solved? Discuss the recent techniques

UPSC Civil Services Mains 2021 · Anthropology GS 1 · 15 marks · Applications of Anthropology

12. Applications of Anthropology: Anthropology of sports, Nutritional anthropology, Anthropology in designing of defence and other equipments, Forensic Anthropology, Methods and principles of personal identification and reconstruction, Applied human genetics-Paternity diagnosis, genetic counselling and eugenics, DNA technology in diseases and medicine, serogenetics and cytogenetics in reproductive biology.

Core demand of the question

- Write a note on disputed paternity and recent techniques used in that context
- Write about 200 words for 15 marks

Revision summary

Older tests excluded alleged fathers with blood groups and HLA.

STR DNA profiling can strongly include a man as biological father.

Y-STRs track the male line; mtDNA does not decide paternity.

Prenatal tests can use fetal DNA in maternal blood.

Kinship still distinguishes social pater from genitor.

Introduction

Disputed paternity is a legal and kinship claim about who the genitor is. Anthropology already knew social fatherhood. Recent techniques name a biological probability.

Body

The older kit

- Blood groups (ABO, Rh) could exclude a man. They could not prove him. **Landsteiner** made the first serological exclusions.
- HLA and protein polymorphisms raised the power of **exclusion** but still left many men unexcluded.
- Kinship systems already split genitor and pater, as in older **Nayar** visiting husbands or **Trobriand** beliefs about conception. The lab does not erase the social father.

Recent techniques

- **DNA profiling**, after **Alec Jeffreys**, uses STRs (short tandem repeats). A child must match one allele at each locus from the alleged father, barring mutation.
- Multiplex STR kits, used in Indian forensic labs, yield paternity indices and very high probabilities when the mother is tested too.
- **Y-chromosome STRs** follow the paternal line. **Mitochondrial DNA** follows the mother and does not decide paternity.

- SNP arrays and sequencing can work on degraded samples. Non-invasive prenatal paternity tests use fetal DNA in maternal blood.
- **Limits:** twins, close relatives as alternative fathers, mutations, and chain-of-custody. Ethics of consent and of revealing incest or infidelity sit with the result.

Anthropological caution

- A probability is not a kinship system. **Malinowski's Trobriand** pater remains a jural person even when a lab names another genitor.

Flow diagram

Disputed paternity -> Blood group exclusion
Disputed paternity -> STR STR DNA probability probability
STR DNA probability -> Court index
Disputed paternity -> Pater vs genitor

Conclusion

Exclusion began with blood groups. STR DNA now assigns high probability to a biological father. Social paternity and laboratory paternity must still be named apart.

Facts & figures

Jeffreys

Introduced DNA fingerprinting, which became STR-based paternity testing.

STR multiplex

Standard forensic panels that generate a paternity index when mother, child, and alleged father are typed.

Exclusion

A single incompatible locus (not explained by mutation) rules a man out.

Trobriand

Ethnography of social fatherhood that does not rest on a laboratory genitor.