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Q5(b)

Evolutionary significance of menopause.

UPSC Civil Services Mains 2025 · Anthropology GS 1 · 10 marks · Relevance of menarche, menopause and other bioevents to fertility. Fertility patterns and differentials.

11.1 Relevance of menarche, menopause and other bioevents to fertility. Fertility patterns and differentials.

Core demand of the question

- State what menopause is as a life-history fact in humans
- Explain why a long post-reproductive life is an evolutionary puzzle
- Give the main hypotheses, with ethnographic or primate comparison
- State the evolutionary significance without medical detail only

Revision summary

Menopause ends fertility well before death and creates a long post-reproductive span in humans.

That is a puzzle because selection usually favours more births.

- **Hawkes's grandmother hypothesis** uses **Hadza and other foraging data**: older women feed grandchildren.

The mother hypothesis says stopping late births protects children already born.

Chimpanzees rarely match this human pattern.

Significance is cooperative breeding and life history, not a clinic essay.

Introduction

Menopause is the permanent end of fertility well before the end of life. In humans this leaves a long post-reproductive span, especially for women who survive mid-life. That is an evolutionary puzzle, because natural selection usually favours continued reproduction. The significance lies in life history, not in a clinic note on hormones.

Body**The puzzle**

Most mammals reproduce until late in life. Wild chimpanzees rarely show a long, healthy post-reproductive period of the human kind. If genes only "care" about more births, stopping ovulation decades before death looks wasteful. **George Williams** posed related life-history problems through **antagonistic pleiotropy**: a trait can be favoured early in life even if it costs later.

Humans also have unusually long childhoods and high-cost children. Menopause belongs with that slow life history.

Main hypotheses

- **Grandmother hypothesis (Kristen Hawkes):** Among the Hadza and in other foraging data, older women collect food and support grandchildren. Extra calories raise the survival of kin who share the grandmother's genes. Selection then favours a long healthy life after fertility ends. This is **inclusive fitness**, not sentiment.
- **Mother hypothesis:** Stopping further births reduces the risk that a late pregnancy kills a woman who already has dependent children. The existing brood is protected.
- **Embodied capital and pairing:** Long adult life, male provisioning and pair bonds (as in some models by **Hill** and **Kaplan**) make a three-generation economy possible. Menopause is one piece of that package, not a lone mutation.
- **What it is not:** A simple pathology of ageing. If it were only decay, we would not expect the regular mid-life shift plus decades of useful work.

Killer whales are sometimes cited as another menopause case. They are a comparison, not the human explanation.

Evolutionary significance

Menopause marks humans as cooperative breeders with stacked generations. It helps explain childhood, longevity and female social value after childbearing. It also warns against reading every sex difference as a Victorian "woman's nature". The trait is about kin investment and life history.

Flow diagram

Menopause -> Post-reproductive life
Post-reproductive life -> Grandmother help / Hawkes
Post-reproductive life -> Protect existing children
Post-reproductive life -> Long childhood package

Conclusion

The evolutionary significance of menopause is a long post-reproductive life that can still pay, mainly through grandmaternal help and the protection of existing children. Hawkes and the Hadza, and the chimpanzee contrast, keep the argument in life-history theory rather than in gynaecology.

Facts & figures

Grandmother hypothesis

Kristen Hawkes argued that post-reproductive women raise inclusive fitness by provisioning grandchildren, with Hadza foraging as a key ethnographic file.

Antagonistic pleiotropy

George Williams's idea that genes with early-life benefits can be selected even if they bring later costs. It frames ageing and life-history trade-offs.

Human-chimpanzee contrast

A long, regular post-reproductive life is marked in humans and weak or rare in wild chimpanzees, which is why menopause is treated as a human life-history problem.

Inclusive fitness

Selection can favour helping kin who share genes. Grandmaternal care is argued in that currency, not as simple kindness.

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