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Q6(c)

Critically evaluate the reasons of reduction in age at menarche in human females over the successive generations

UPSC Civil Services Mains 2022 · Anthropology GS 1 · 15 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

- Critically evaluate the reasons of reduction in age at menarche in human females over the successive generations
- Write about 200 words for 15 marks

Revision summary

Many populations show a secular fall in age at menarche.

Tanner placed it with taller, earlier-maturing children.

Nutrition and fewer childhood infections are the main engines.

Genes cannot explain a century-scale drop.

The trend is uneven by class and has health costs when too early.

Introduction

Age at first menstruation has fallen across many industrial and urbanising populations. The trend is real, but the causes are mixed and the floor is not zero.

Body

The trend

- European historical series, and later Japanese and Indian urban data, show menarche moving from about 16-17 toward 12-13 years over a century.
- **Tanner** treated this as part of the **secular trend** in growth.

Reasons offered

- Better childhood nutrition and lower infection raise body fat and **leptin** signals that permit ovulation. This is the strongest bio-cultural case.
- Urban light, less heavy labour, and smaller family size travel with the same trend.
- Endocrine-disrupting chemicals are a hypothesis, not yet the whole story.
- Genetic change across three generations is too slow to explain the shift. Plasticity is the point.

Critique

- Rural and undernourished groups may not show the same fall. **Indian** ICMR and **NFHS** patterns still vary by wealth and caste.

- **Very early menarche has costs:** anaemia, school exit, and later metabolic risk. A falling mean is not an unqualified gain.
- Reporting error and school samples can exaggerate smoothness.

Flow diagram

Nutrition low infection -> Fat signals
Fat signals -> Earlier menarche
Urban light labour -> Earlier menarche

Conclusion

Falling menarche is mainly a nutrition and infection story of the **secular trend**. Chemicals and lifestyle may add, but genes do not sprint in a century.

Facts & figures

Tanner

Documented secular acceleration of growth and maturation in industrial countries.

Leptin

A fat-related signal implicated in the nutritional gating of puberty.

NFHS

Indian surveys still show later menarche where undernutrition persists.

Secular trend

A generation-scale shift in size and timing, reversible if conditions worsen.

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