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Prof Greet Schoeters
VITO
Boeretang 200
2400 Mol
Belgium
Email: greet.schoeters@vito.be

Abnormalities in puberty development

Greet Schoeters* (VITO, Belgium & University of Antwerp, Belgium), Elly Den Hond (VITO, Belgium)

Background: Despite a wide variation in timing of pubertal onset throughout the world, a secular trend in the earlier onset of pubertal development and an increased incidence of sexual precocity have been observed over the last decades in different European countries. This may increase risks for earlier pregnancies and lower birth weights.

Review and discussion: The triggers for puberty onset are not well understood. Pubertal maturation is preceded by weight gains in infants and paralleled by changes in height, and increases in body size. The endocrine system with the hypothalamic-pituitary-gonadal axis certainly plays a central role. Nutritional status and changes in the lipid and leptin status, but also exposure to environmental hormone-mimicking substances (i.e. endocrine disruptors) may affect the endocrine regulation.

The critical window for influencing onset of puberty (prenatal, post-natal and pubertal) is not known. Some studies point to the early postnatal period as an early window of susceptibility since rapid infancy weight gain is associated with an earlier onset. Other studies mention reduced intra uterine growth rate as an indicator which may influence growth outcomes in later life. Hormone mimicking substances may influence the different stages and hence the puberty onset. Animal and human epidemiological studies provide information for testing the different hypotheses. However, the presence of a mixture of different environmental components with antagonistic effects (estrogenic, anti-estrogenic, anti-androgenic) in the human body may hamper the interpretation of results.