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Ovarian function across two life history transitions: puberty and the postpartum resumption of fecundity

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Abstract:

Female ovarian function undergoes a progressive transition from amenorrhea to fully competent ovulatory cycles both during puberty and during the postpartum lactational period. These two periods represent state transitions in reproductive effort during which energy allocation shifts from the support of growth, either of self or of offspring, toward potential support for a new pregnancy. We present a model of the hormonal mechanisms involved in these two transitions, a model which emphasizes their formal similarity. Related pituitary hormones, human growth hormone and prolactin, are responsible for the direction of metabolic energy toward anabolic processes, either adolescent growth or milk production. Both of these anabolic processes lead to peripheral insulin resistance and rising insulin levels, which eventually synergize with low gonadotropin levels to stimulate ovarian function. Rising estrogen levels resolve the transitory period of insulin resistance and restore peripheral insulin sensitivity. Data supporting this model are presented from 70 lactating Toba women of northern Argentina and from an initial pilot study of Toba adolescents. The implications of the model for the integrity of human life history strategies and for relationships between adolescent and adult health are noted.