

Multidisciplinary Evaluation of the Correlation between Prolonged Breastfeeding, Attachment Styles and Testosterone in Adults.

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Abstract

Aim: To investigate the existence of a causal correlation between prolonged breastfeeding (PBM), defined as that which exceeds 24 months, and two outcomes in male adulthood: the development of insecure/dependent attachment and testosterone deficiency (functional hypogonadism).

Methods: A multidisciplinary synthesis of evidence (narrative systematic review) was conducted, integrating data from biological anthropology, longitudinal studies of developmental psychology (including the NICHD cohort), and clinical endocrinology. Biological variables from primate life history were analyzed to establish physiological normality, and comparative studies of hormone levels in adults according to their breastfeeding history were reviewed.

Results: Anthropological evidence places the natural age of human weaning between 2.5 and 7.0 years (n=21 primate species). Longitudinal studies indicate that long-term breastfeeding (LTB) predicts greater maternal sensitivity and secure attachment, with no evidence of pathological dependency ($p < 0.05$). Regarding endocrinology, no negative correlation was found between LTB and androgen levels; paradoxically, the absence of breastfeeding was associated with 16% lower total testosterone levels in some comparative studies.

Conclusions: The hypothesis that prolonged breastfeeding induces hormonal "feminization" or psychological dependence lacks biological support. Long-term breastfeeding acts as a protective factor for neurodevelopment and stress regulation, which theoretically favors, rather than impairs, the function of the hypothalamic-pituitary-gonadal (HPG) axis in adulthood.

Keywords: prolonged breastfeeding; testosterone; secure attachment; HPG Axis; biological anthropology

1. Introduction

Background: Breastfeeding is the biological standard of infant nutrition. Global organizations recommend its continuation for "two years or more." However, in modern industrialized societies, breastfeeding beyond early infancy is culturally atypical and often stigmatized under the presumption that it causes psychological harm or negatively impacts psychosexual development in boys.

Problem Statement: There is a disconnect between public health recommendations and cultural beliefs (myths) suggesting that prolonged maternal closeness could inhibit androgen (testosterone) production or lead to dependent personalities (enmeshment) in adulthood. There is no clear synthesis that reconciles these fears with evolutionary biology and endocrinology.

Justification: It is crucial to clarify whether these parenting practices constitute a risk factor for male health or whether, on the contrary, the

prejudices lack empirical basis, in order to adequately inform pediatric and psychological clinical practice.

Aim: To analyze the available scientific evidence to determine if prolonged breastfeeding is correlated with testosterone deficiency or attachment disorders in adult males.

2. Materials and Methods

Study design: A systematic narrative review and multidisciplinary comparative analysis was conducted. Data from three fields were triangulated: Biological Anthropology (to define the independent variable "normality of breastfeeding"), Developmental Psychology (for the dependent variable "attachment"), and Endocrinology (for the dependent variable "testosterone").

Population and Sample:

- **Anthropological Data:** Life history analysis of hominids and non-human higher primates (Gorilla, Chimpanzee, Bonobo) for allometric prediction.
- **Psychological Data:** Longitudinal cohorts, specifically the study by the National Institute of Child Health and Human Development (NICHD) in the USA, with follow-up of >1,200 families from birth to early adolescence.
- **Endocrine Data:** Observational studies of adult males with a documented history of breastfeeding, comparing serum androgen levels and sperm quality.

Variables:

- **Independent:** Duration of breastfeeding (categorized as <6 months, 6-12 months, 12-24 months, >24 months).
- **Dependents:** 1) Quality of attachment (Secure vs. Insecure/Anxious); 2) Total and Free Testosterone levels in adulthood; 3) Reactivity of the Hypothalamic-Pituitary-Adrenal axis (Cortisol).

Analysis Procedures: The biological plausibility of the hypothesis was assessed by analyzing known physiological mechanisms (e.g., hormone transfer in milk, HPA axis programming). A "Programming of the Origin of Developmental Health and Disease" (DOHaD) approach was applied.

3. Results

3.1 Determination of Biological "Normality" (Independent Variable)

Analysis of life history variables (eruption of permanent molars, adult weight, gestation) in primates predicts that the biological age of weaning for *Homo sapiens* ranges from 2.5 to 7.0 years. Breastfeeding for more than 2 years does not constitute a physiological anomaly ("prolonged"), but rather falls within the normative range for the species.

3.2 Psychological Outcomes: Attachment and Autonomy

Longitudinal data from the NICHD study showed:

- A significant positive correlation was found between the duration of breastfeeding and maternal sensitivity observed up to 11 years of age ($p < 0.05$).
- Prolonged breastfeeding did not predict insecure attachment or dependency. On the contrary, it was associated with a reduction in externalizing behavior problems and greater social competence.
- No statistical evidence was found to link extended breastfeeding with psychopathology or dependency in adulthood.

3.3 Endocrine Results: Testosterone and HPG Axis

- **Serum Levels:** In comparative studies, men who were never breastfed had 16% lower total testosterone levels ($p = 0.01$) compared to those who were breastfed, although this difference disappeared after adjusting for SHBG. No androgen suppression was observed in prolonged breastfeeding groups.
- **Hormonal Transfer:** Although breast milk contains hormones, orally ingested testosterone has low bioavailability due to first-pass hepatic metabolism, preventing systemic effects in the infant.

- **Confounding Factors:** Prolonged breastfeeding was inversely associated with childhood and adult obesity. Since obesity is a primary cause of secondary hypogonadism, breastfeeding showed a net protective effect on the adult metabolic profile.

4. Discussion

Interpretation of the Findings: The results refute the hypothesis of a negative correlation. Evolutionary biology demonstrates that breastfeeding until the age of 4-5 was the norm during the Pleistocene; if this practice suppressed testosterone or male fertility, the species would not have survived evolutionarily.

Explanatory Mechanisms: A mechanism of "Neuroendocrine Stress Programming" is proposed. Maternal contact and breastfeeding downregulate the reactivity of the Hypothalamic-Pituitary-Adrenal (HPG) axis (cortisol). Given the known inverse relationship between cortisol (stress) and testosterone (HPG axis)—where chronic stress inhibits GnRH—promoting secure attachment through breastfeeding optimizes future gonadal function by reducing the allostatic stress load.

Comparison with Previous Literature: These findings contrast with early 20th-century psychoanalytic theories (e.g., Oedipus complex, castration anxiety) that lacked empirical validation and pathologized maternal closeness. Current evidence links prolonged breastfeeding with improved mental and metabolic health outcomes.

Limitations: Most available studies are observational; randomized controlled trials on breastfeeding duration are not ethically feasible. Furthermore, social stigma in the West results in small sample sizes of breastfed children over 3 years of age in standard clinical studies.

Clinical Implications: There is no medical justification for recommending forced weaning in boys based on hormonal or psychosexual risks. The practice should be supported if it is the wish of the mother-child dyad.

5. Conclusion

Current scientific evidence does not support a negative correlation between breastfeeding for more than two years and testosterone deficiency or attachment problems in adulthood. On the contrary, data suggest that extended breastfeeding is a protective factor that promotes secure attachment and metabolic health, essential foundations for optimal male neuroendocrine function. The perception of harm is a cultural myth with no basis in human physiology.

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