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Association of maternal breast milk and serum levels of macronutrients, hormones, and maternal body composition with infant's body weight

Background/objectives:
This study was aimed to investigate the association of maternal serum and breast-milk levels ofmacronutrients, hormones, growth factors, and maternal body composition with infant's body weigzht.

Subjects/methods:
Eighty mother–infant pairs comprised 40 with overweight or obese infant and 40 with normal-weight infant were enrolled in this study. The level of ghrelin, Leptin, adiponectin, EGF, and IGF1 in plasma and breast milk were assessed. Daily breast milk intake and macronutrient concentration along with anthropometric indices of mother–infant pairs were also assessed.

Results:
No significant differences were observed in concentrations of serum hormones between two groups ($p > 0.05$).
However, hormones levels in maternal serum were higher than those in breast milk. A significant positive correlation was found between serum EGF and ghrelin ($r = 0.57$, $p = 0 < 0001$). Higher IGF1 in serum showed a significant association with its milk counterpart ($r = 0.37$). Current mother's weight was associated with infant's weight at the 2nd and 6th month ($B = 0.023$ $p = 0.04$, $B = 0.055$ $p = 0.005$). The breast-milk macronutrient content was not comparable between two groups. However, the average daily breast milk consumption in obese infants was higher than normals ($p = 0.001$). Milk EGF and leptin were related to a decrease of 59% and 46% the odds of obese infant development, respectively. There was a significant
association of milk EGF and ghrelin with birth weight ($B = -0.19$, $p = 0.04$ and $B = -0.2$, $p = 0.04$, respectively), and also serum leptin with infant's body weight at the 6th month.

Conclusions:
Our findings provide a positive association of maternal weight, daily breast milk intake, EGF, and ghrelin with infant's body weight.

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