

ASSOCIATION BETWEEN PRETERM BREASTMILK MELATONIN CONCENTRATION AND PSYCHOSOCIAL FACTORS AT BIRTH (ProMote)

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Background and aims: Melatonin in human milk is important for infant neurodevelopment. Preterm birth leads to sudden interruption of transplacental transfer of melatonin that normally takes place during the last part of pregnancy. Breastmilk is the only source of melatonin for the preterm neonate during the first months of life. Contradictory evidence on the way breastmilk melatonin concentration is associated with psychosocial factors shows a general trend for stress, fatigue, and negative mood to be associated with higher melatonin in morning milk samples although laughter increased the levels of breastmilk melatonin in healthy mothers. The aim of this study is to explore the psychosocial factors that may be associated with preterm breastmilk melatonin concentration immediately after birth.

Methods: The study included 64 mothers, and their preterm neonates (<37 weeks) (NICU, University General Hospital of Heraklion) (Mean [SD] gestational age: 33.7 [2.0] weeks). Mothers collected 5-10 ml of nighttime breast milk using an electric pump at three time points: 3rd-5th day (colostrum), 10th-14th day (transitional milk), and 20th-28th day (mature milk). Melatonin levels were measured using an ELISA kit. Within the first 3 days postpartum, maternal psychosocial factors were assessed, including depressive symptoms (*EPDS*), anxiety (*STAI*), and family functioning (*FACES-IV*).

Results: A total of 64 mothers provided breast milk at three time points: 3rd-5th day (n=55, Mean [SD]=19.7 [14.7]), 10th-14th day (n=47, Mean [SD]=24.3 [22.7]), and 20th-28th day (n=42, Mean [SD]=21.5 [19.4]). Preliminary findings show a trend for a positive association between postnatal anxiety/depression and melatonin levels in colostrum breastmilk ($r=0.193$ and $r=0.153$). Higher maternal postnatal depression/anxiety correlates with increased melatonin concentration.

Conclusions: Despite sample size limitations, higher maternal anxiety and depression have been correlated with increased melatonin concentration in colostrum breastmilk. Further research is needed to confirm this trend and explore its potential impact on neonatal development.