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Short Notes on Newborn Stimulus Resulted in a Rapid Increase in Maternal Salivary Oxytocin

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Perspective

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INTRODUCTION

Oxytocin (OT) is a neuropeptide that plays a role in social behaviour and reproduction in humans. Non-invasive OT levels in saliva have recently piqued the interest of researchers because they do not require a specialised medical setting. We tracked OT concentration changes in one woman's basal serum and saliva OT from pregnancy to one year postpartum. We looked at how salivary OT levels changed over time in response to maternal physiological and behavioural responses. During pregnancy and breastfeeding, the fluctuation of saliva OT levels is well correlated with serum OT.

However, while salivary OT increased rapidly during direct interaction with the infant (social interaction tests) and/or when the mother watched her own infant's video (video tests), there was no increase in serum. To clarify these single-subject results, we used social interaction and video tests on a group of mothers (nine for social interaction and six for video testing). The mothers had increased OT in their saliva but not in their serum in both tests. Our findings suggest that salivary samples can reflect not only physical but also emotional states, and that saliva samples can be used to monitor women's OT levels during the pre- and postpartum periods.

DESCRIPTION

Oxytocin (OT) is a neuropeptide that has been linked to social and reproductive behaviour in a variety of mammalian species, including humans. OT, which is primarily produced in the hypothalamus, plays an important role both peripherally and centrally. OT has long been associated with uterine contractions [1-3] and lactation in the peripheral. It is central to a variety of social behaviours and social relationships, as well as modulating stress and anxiety-related behaviours. Furthermore, in rodents and sheep, high OT levels during the peripartum period promote the mother-offspring bond and regulate maternal behaviour such as care, offspring recognition, maternal aggression, and reduced anxiety and fear responses.

The amount and quality of parenting behaviours have been shown to correlate with OT signalling pathways in rodents, rhesus macaques, and humans, and the OT signalling pathways of offspring in rhesus macaques and prairie voles are highly modulated by their experience in youth. In prairie voles, disrupted maternal care is said to have a big impact on the offspring's social behaviour. These OT roles in maternal behaviour and mother-child bonding are also present in humans. OT in maternal plasma[4] and saliva has been linked to postpartum social behaviour in mothers. The interaction with the parent causes the infant's OT release, and the association between the parent's and infant's OT levels was stronger when affect synchrony was higher.

In contrast, genomic changes in OT signaling-related genes are associated with poor maternal behaviour quality. For example, risk alleles of the OXTR and CD38 genes[5], which have been linked to social dysfunctions, were linked to less parental touch toward their infants and less parent-infant gaze synchrony. Furthermore, as found in animal studies, a lack of emotional and physical contact from parents has an impact on children's OT systems. Maltreated children or children raised by a mother suffering from mental illness, such as postpartum depression, have dysregulated OT systems, according to research. Evidence suggests that negative social relationships in childhood have a lifelong impact on children and are likely to cause mental illness or social inability. As a result, a better understanding of the underlying physiology of normal and abnormal mother-child interactions related to their OT systems is required, as well as expanded association studies of OT signalling and maternal behaviours and/or bonding in humans.

CONCLUSION

Human OT levels have been measured in plasma, serum, urine, and cerebrospinal fluid samples (CSF). Each method of

collection has advantages and disadvantages. CSF reflects central OT levels but necessitates a lumbar puncture, which is highly invasive and only performed by doctors. Urine collection is less invasive and does not necessitate the use of professionals, but the temporal resolution is low, as with CSF collection. Blood collection, in comparison, requires the assistance of a medical professional but is less invasive than CSF collection and has a much higher temporal resolution than the other two sample types. As a result, collecting plasma or serum has been the most commonly used method for detecting OT levels, particularly in studies of pregnant women.

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