

# Midwifery and Neonatal Nursing

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## Intranasally-applied oxytocin alleviates aberrant maternal behaviors evoked by cesarean section in rats: Involvement of supraoptic neurons

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Milk shortage and aberrant maternal behaviors in women with cesarean section (CS) have become an increasing concern for the health of mothers and the babies recently; however, the underlying mechanisms and optimal therapeutic approaches remain to be explored. In this study, we found that CS significantly reduced retrieving, anogenital licking and suckling behaviors of rat dams while increasing the rate of self-grooming. Moreover, early dam-pup contact evoked more self-grooming while delayed maternal contacts resulted in severe hypogalactia. Intranasal application of oxytocin (OXT), a hypothalamic neuropeptide largely restored normal pattern of maternal behaviors in the CS dams. In whole-cell patch-clamp recordings putative OXT neurons in the supra optic nucleus (SON) in brain slices from the CS dams had lower firing rate and more depolarized resting membrane potential. Western blot and immunohistochemical analyses revealed that CS increased the expression of phosphorylated extracellular signal regulated protein kinase (pERK) 1/2, particularly at non-OXT neuronal components and glial fibrillary acidic protein (GFAP) of astrocytes in the somatic section of the SON. In the CS dams, intranasal application of OXT increased c-Fos protein in the area rich in OXT neurons but reduced GFAP in the somatic section of the SON while decreasing pERK 1/2 expression. These results indicate that CS can lead to postpartum depression and anxiety in association with the time of postpartum mother-baby contact, which is largely due to the suppression of hypothalamic OXT-secreting system; intranasal OXT can partially reverse these aberrant behaviors, thereby highlighting a novel therapeutic target.

### Biography

Yu-Feng Wang has completed his PhD from Fukui Medical University and postdoctoral studies from Yale University School of Medicine and University of California-Riverside. He is the Director of Laboratory of Neuroendocrine Studies in Harbin Medical University. He has published more than 35 papers in reputed journals and has been serving as an Editorial Board Member of the Frontiers in Cellular Neuroscience.

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