

Tactile-kinesthetic Stimulation and Soft Tissue Manipulation as Modulators of Blood Cortisol Levels in Preterm Neonates: A Narrative Review

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ABSTRACT

Preterm neonates admitted to paediatric and neonatal care settings are frequently exposed to environmental and procedural stressors that activate the Hypothalamic–Pituitary–Adrenal (HPA) axis, leading to elevated blood cortisol levels. Persistent stress responses in this vulnerable population may adversely affect neurodevelopmental and physiological outcomes. Non-pharmacological, touch-based interventions such as Tactile-Kinaesthetic Stimulation (TKS) and Soft Tissue Manipulation (STM) have emerged as potential strategies to attenuate stress and promote autonomic stability. This narrative review aims to synthesise existing evidence on the role of TKS and STM in modulating blood cortisol levels among preterm neonates. A narrative analysis of published literature was conducted using electronic databases, including PubMed, Scopus, and Google Scholar. Studies exploring TKS, massage therapy, STM and related

manual interventions in preterm neonates were reviewed, with particular emphasis on outcomes related to blood cortisol levels and stress regulation. The reviewed evidence suggests that TKS and STM are associated with reductions in blood cortisol levels, improved autonomic regulation, enhanced sleep patterns and better weight gain in preterm infants. Proposed mechanisms include modulation of the HPA axis, vagal stimulation, and improved parent–infant interaction. However, heterogeneity exists in intervention protocols, duration, intensity, and outcome assessment methods. TKS and STM appear to be promising, safe, and cost-effective interventions for stress modulation in preterm neonates. While current evidence supports their beneficial effects on blood cortisol levels, further well-designed clinical studies are required to establish standardised protocols and strengthen causal inference.

Keywords: Cortisol, Neonates, Touch, Pain.

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