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Chromogranin A and B in newborn infants

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Background: Chromogranin A and B (CgA and CgB) are two members of the family of chromogranins/secretogranins. These are acidic, heat-stable proteins found in the secretory granules of practically all neuroendocrine cells and many neurons. Both CgA and CgB are abundant in the chromaffin cells of the sympatho-adrenal system, where they are co-stored and co-released with catecholamines. Plasma levels of CgA increase when the sympatho-adrenal system is activated markedly in adults. In human infants during birth the sympatho-adrenal system is highly activated, which is strongly related to parturition circumstances such as mode of delivery or perinatal asphyxia. In term human infants after an uneventful delivery CgA is significantly elevated and shows a modest correlation to plasma noradrenaline levels.

Aim: In order to establish, if CgA or CgB could be valuable marker of stress/distress in newborn infants, the influence of a variety of clinical parameters indicating high fetal sympatho-adrenal stimulation on chromogranin levels was investigated. An influence of gestational age on chromogranin levels was also examined.

Material and methods: Plasma CgA and CgB concentrations in cord blood of 90 newborn infants were measured by radioimmunoassay.

Results: The mode of delivery was highly influential on circulating CgA and CgB in cord blood, with highest values after deliveries known to be particularly stressful for the infant, i.e. ventouse and breech delivery.
Plasma CgA and CgB are also significantly elevated in children with clinical signs of asphyxia such as low Apgar score and meconium stained amniotic fluid.
Circulating CgA but not CgB was inversely correlated to gestational age i.e. preterm infants have higher CgA levels.

Conclusion: The newborn infant releases substantial amounts of CgA and CgB, and even more so under stressful parturition circumstances, when high sympatho-adrenal stimulation can be assumed.
Higher CgA levels in the preterm infant suggest a physiological role in human development.