

Reduction of Neonatal Neuropathology

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Abstract

Recent findings elucidate the significance of lower levels of serum IGF (insulin-like growth factor-1) in premature neonates compared to full-term gestations. IGF is a key promoter of neo-neuronal myelination and connectivity in the developing brain. The lower concentration of serum IGF in preemies than in term infants could account for a higher incidence of neuropathologic outcomes such as autism in the former than the latter. A practical, economical approach for reducing this potential risk could be breast-feeding exclusively for the first year of life in both cases since human milk has a higher concentration of IGF than bovine milk or formula.

Report

One group of biochemical disorders that has been identified more often in babies born prematurely than at term are those which later are manifested in the same children as neurodevelopmental deficits. In particular, this would include autism and its related maladies such as Phelan-McDermid and Rett Syndromes [1]. Recently, Insulin-like Growth Factor (IGF-1) and some of its analogues, as originally discovered in bovine colostrum [2], have emerged as possible therapeutic agents for this group of disorders [3]. The cord blood level of IGF in preterm neonates is typically lower than in term infants [4,5]. Autism is characterized by inadequate oligodendrocyte myelinogenesis, a function which is commonly promoted by IGF [6,7]. The brain dysconnectivity found in cases of autism is thought to be a consequence of neuronal myelin deficiency in the first year of life [8]. Autism is more often detected in children who were born prematurely than at full-term [9]. The range of IGF concentrations in cord bloods of such neonates parallels this distinction [10]. Human milk contains more IGF per volume than cow's milk; cow's milk has more IGF than formula [11]. Experiments with animals have shown that IGF survives passage through the stomach, probably due to encirclement with casein. Children who were breast-fed exclusively for a full year have a lower incidence of autism than those fed by other means [12]. Hence, it would seem efficacious in reducing the incidence of neuropathologic conditions, especially in preemies, if at-risk neonates were fed breast milk exclusively for the first year of life.

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