Taurine and Neonatal Nutrition

Deepak Chawla¹

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Taurine is one of the sulfur-containing amino-acids. Although, not a part of any protein, it is widely distributed in body and is the most abundant free amino acid in human breast milk. High concentration of taurine is found in brain, mature retina and inner ear [1]. In neural tissues, taurine functions as an intracellular organic osmolyte, thus regulating the neural cell volume. By modulating the intracellular calcium homeostasis, it has membrane stabilizing effect. Taurine also has cytoprotective effect against oxidative damage and glutamate-induced excitotoxicity [2]. Preterm neonates are more vulnerable to taurine deficiency due to low capacity for endogenous synthesis and higher renal loss. Human milk contains adequate amount of taurine and neonates fed with human milk may grow slower than neonates fed with formula milk but have better neurodevelopmental outcome [3]. Higher taurine content of human milk has been assigned as one of the reasons of beneficial effects of human milk feeding on neurodevelopmental outcome [4]. Prolonged feeding with taurine-deficient formula milk or parenteral nutrition has been associated with retinal degeneration, delayed auditory maturation, decreased bile acid secretion, lower fat absorption and hepatic cholestasis [1]. Recognition of potential harmful effects of taurine deficiency in the last decade of the twentieth century, led to recommendations about minimal taurine content in formula milk. Now, all formula milk preparations are supplemented with taurine to match the intake during human milk feeding (4.5–9 mg/kg/d) [5].

A few randomized controlled trials were conducted before taurine supplementation of formula milk became a routine practice. All these trials, totaling 9 in number are small underpowered studies with cumulative enrolment of 216 low birth weight neonates [2]. Not all the clinically important outcomes have been reported in these trials. Therefore, reaching a meaningful conclusion about beneficial or harmful effects of taurine

supplementation is not easy. Cao et al. present the findings of their systematic review on taurine supplementation in this issue of the journal [6]. Like results of a Cochrane review on this topic, no clinically beneficial effect of taurine supplementation was observed on short-term physical growth of neonates [2]. None of the studies have reported long-term effects on the neurodevelopment. On the contrary, studies in term infants and in animal models suggest delayed auditory maturation with taurine supplementation [7]. No fresh studies have been conducted after 1993. Due to lack of evidence supporting or against it, routine taurine supplementation of preterm formula preparations to mimic the intake of breastfed infants will continue. However, is there a role of higher intake of taurine during any development stage? Careful studies are warranted to study the effect of taurine in selective subgroups like neonates born at extremely prematurity or with birth asphyxia.

Compliance with Ethical Standards

Conflict of Interest None.

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✉ Deepak Chawla
drdeepakchawla@gmail.com

¹ Department of Neonatology, Government Medical College Hospital, Chandigarh 160 030, India