Necrotising enterocolitis (NEC) is a potentially disastrous illness that occurs in 6–8% of preterm (gestation < 32 weeks) very low birth weight neonates. The mortality (~25%) and morbidity of Stage II NEC (e.g. need for surgery, survival with short bowel syndrome with protracted feed intolerance, complications of prolonged feed intolerance) and Stage III NEC (e.g. need for surgery, survival with short bowel syndrome with protracted feed intolerance, complications of prolonged feed intolerance) and NEC is extremely high in extremely low birth weight neonates. The well established (e.g. antenatal glucocorticoids, early preferential feeding with breast milk, standardised feeding protocols) as well as newer strategies (e.g. probiotics, prebiotics) for primary as well as potentially secondary (e.g. nutritional) prevention of NEC will be reviewed.

**Background**

The goal of this study was to evaluate the possible cytoprotective effect of CDP-choline treatment on intestinal cell death and apoptosis in a neonatal rat model of NEC.

**Methods**

A total of 30 newborn pups were divided equally into 3 groups as follows: Control, NEC, and NEC+CDP-choline groups. NEC was induced by enteral formula feeding, exposure to hypoxia-hyperoxia and cold stress. CDP-choline was administered intraperitoneally at a dose of 300 mg/kg/day for 3 days starting from the first day of life. Macroscopical, histopathological, inflammatory markers, caspase-3 expression and apoptosis were evaluated on the gut samples. Activities of xanthine oxidase, superoxide dismutase, glutathione peroxidase, malondialdehyde and myeloperoxidase were determined.

**Results**

Median clinical sickness score, macroscopic gut assessment score and intestinal injury score were significantly improved in pups in NEC+CDP-choline group. In contrast, median apoptosis score was significantly higher in NEC group compared with NEC+CDP-choline group. Proinflammatory cytokine concentrations (IL-1β, IL-6 and TNF-α) and caspase-3 expression in the intestinal tissue of the NEC+CDP-choline group were significantly lower. Moreover, tissue GSH-Px and SOD activities were preserved, whereas tissue MDA content, MPO and XO activities were significantly lower in NEC+CDP-choline group.

**Conclusion**

This is the first study to report beneficial effects of CDP-choline treatment on intestinal injury in a neonatal rat model of NEC. Intraperitoneal CDP-choline administration significantly reduced clinical sickness score, ameliorated macroscopic and histopathological intestinal injury, reduced the inflammation and decreased apoptosis. These data suggest that, CDP-choline may be used as an effective therapeutic agent for prevention of NEC.