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Melatonin ameliorates necrotizing enterocolitis in a neonatal rat model

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Introduction: We designed the present study to evaluate the efficacy of melatonin (M) on the severity of necrotizing enterocolitis (NEC) in a neonatal rat model.

Materials and Methods: Immediately after birth, pups were weighed and randomized into three groups; NEC, NEC+M, and control. NEC was induced by enteral formula feeding and exposure to hypoxia following cold stress at 4°C and oxygen. The NEC+M group received 10 mg/kg melatonin daily for 3-days after the first day of the NEC procedure. The pups were killed on the fourth day and their intestinal tissues were harvested for biochemical and histopathologic analysis. Blood sample were also obtained from the pups.

Results: The mortality rate and weight loss were highest in the NEC group. Malondialdehyde (MDA) and protein carbonyl content (PCC) were significantly increased, while superoxide dismutase and glutathione peroxidase were decreased in the NEC-treated pups. Melatonin prevented these changes with these values being similar to control levels in the NEC+M group. Nitrate plus nitrite (NO_x) levels and serum tumor necrosis factor alpha (TNF-α) and interleukin-1β (IL-1β) were increased in the NEC group and histopathologic injury score in the NEC group were significantly higher than in the NEC+M group.

Conclusion: Melatonin significantly reduced the severity of NEC in our study.