Background: The nation-wide survey demonstrates that the mortality of neonatal intestinal perforation has risen up over the past 15 years, which is currently top among all neonatal surgical conditions. The incidence of intestinal perforation associated with extremely-low-birth-weight neonates (ELBWs) has been increasing as more ELBWs have been rescued. In contrast to necrotizing enterocolitis and focal intestinal perforation, the pathogenesis of meconium-related ileus (MRI), defined as functional bowel obstruction characterized by delayed meconium excretion and microcolon, remains unclarified.

Purpose: To elucidate the pathogenesis of MRI histologically and radiologically.

Materials: Thirteen ELBWs with intestinal perforation secondary to MRI were enrolled into this study. Specimens obtained from 16 ELBWs without gastrointestinal diseases were served as age-matched controls for histological study. Results: Nuclear sizes of ganglion cells in MRI and controls were 47.3 ± 22.0 μm² and 37.8 ± 11.6 μm², respectively, showing no significant difference between them. In all cases of MRI, contrast enema demonstrated the gradual caliber change in the ileum and filling defects in the ileum or colon, which locations were not identical.

Conclusion: Morphological immaturity of ganglia was not suggested as the pathogenesis of MRI. The impaction of inspissate meconium is not the cause of obstruction, but, the result of excessive water absorption in the hypoperistaltic bowel before birth, although the underlying mechanisms responsible for the hypoperistalsis remains unclear.