Distribution and quantification of elements of the enteric nervous system in the distal rectum of neonates and infants

S. Lestarevic,1,* M. Lazic,1,2 R. Jankovic2
1 School of Medicine, University of Belgrade, Serbia
2 Institute of pathology, School of Medicine, University of Belgrade, Serbia
E-mail address: sanjaljestarevic@gmail.com (S. Lestarevic).

Aim: Analysis of variations in the ENS of distal rectum in neonates and infants under the age of 6 months, with no previous history of intestinal dismotility.

Introduction: The enteric nervous system (ENS) consists of numerous ganglia along the gastrointestinal tract. The most common disorder of ENS is Hirschsprung’s disease (HD). Diagnostic problems may occur due to insufficient knowledge of the normal distribution of ganglion cells (GC) in the distal rectum.

Methods: The study analyzed ENS of distal rectum in autopsy samples of infants. The sections were stained with hematoxylin and eosin (H&E) and immunohistochemistry using the MAP-2 antibodies. All sections were analyzed at three levels: the level of anorectal junction (ARJ0), at 1 cm (ARJ1) and 2 cm (ARJ2) proximal to the ARJ0. We analyzed number of ganglia and GC, their distribution and thickness of the bundles of nerve fibers (BNF).

Results: GC were found at ARJ0 mainly within BNF of the intramuscular zone. Number of GC within BNF of intramuscular zone were lower at ARJ2 than ARJ1 (H&E: p = 0.021; MAP-2: p = 0.017). Number of GC in submucosal ganglia were significantly higher in ARJ1 and ARJ2 compared to ARJ0. In myenteric ganglia the number of GC were higher at ARJ1 compared to ARJ0 (H&E: p = 0.002; MAP-2: p = 0.014). Number of GC were significantly higher at ARJ2 compared to ARJ1 only in MAP-2 staining (p = 0.009). In submucosal plexus we observed higher number of ganglia at ARJ1 and ARJ2 (p = 0.014, both) compared to ARJ0 at MAP-2. In myenteric plexus there were higher number of ganglia at ARJ1 compared to ARPO (H&E: p = 0.006; MAP-2: p = 0.014). Individual thicker BNF were found in submucosa.

Conclusion: In distal rectum of neonates and infants there are significant variations in number of ganglia in the submucosal plexus up to ARJ2 and in myenteric plexus up to ARJ1.

http://dx.doi.org/10.1016/j.pbj.2017.07.059