

Morphometric features of the colon muscle layer of Wistar rats during aging process

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A significant increase in the elderly population worldwide has been a characteristic of the past years, which has triggered intensification in studies to minimize the deleterious effects of aging on body systems. Aging can diminish the contraction capacity of the smooth muscles that propels and mix the intraluminal contents on the gastrointestinal tract (GIT), leading to dysfunctions in the gastrointestinal motility. Taking into consideration the colon morphological impairment during the aging process, this study aimed at assessing the aging effect on the thickness of the muscle tunica (circular and longitudinal layers) on the colon of Wistar rats (*Rattus norvegicus*). To this end, ten animals were used, distributed in two groups with five animals each: C (six-months-old animals) and MI (eighteen-months-old animals). The animals were sacrificed with an intravenous lethal dose of anesthetic (Thiopental® 40 mg.kg⁻¹ of body weight), and then laparatomized through a median incision in the abdominal wall, to remove the colon (cranial edge - cecum-colon junction and caudal edge - anal sphincter). The colons were divided into proximal and distal and then processed for the Paraplast (Sigma®). m thick transversal cuts stained by the Subsequently, 5 Hematoxylin-Eosin technique were obtained. The muscular layer was measured with the Image-Pro Plus 3.0.1®. Considering the tubular shape of the intestine segments, the cuts were divided into quarters, considering the mesenteric edge as 0°. Four different fields (0°, 90°, 180°, 270°) were captured in each section. Within each field, the greater thickness was measured. The results revealed an increase on the muscle layer thickness, although not significant ($p > 0.05$), in the proximal and distal colon in animals from MI group when compared to group C. The average thickness on animals in group C was 143.7 ± 24.62 μ m in the proximal colon and 135.76 ± 35.24 μ m in the distal colon, while the MI group averaged 152.96 ± 26.78 μ m in the proximal colon and 148.21 ± 24.6 μ m in the distal colon. A partial or complete denervation of smooth muscle occurs during the aging process, leading to a compensatory hypertrophy of it, thus justifying the increase in the thickness of the muscle tunica in the older animals. However, the fact that the changes in the thickness of the muscle layer were not statistically significant, may suggest that the aging effects on the smooth muscle of GIT should be better evidenced in older animals.

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