Structure and ultrastructure of the medial pterygoid muscle of Wistar rats with ageing

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The characteristic of muscle cells from the medial pterygoid muscle of rats with ageing were studied using light microscopy and electron microscopy. Material and methods: specimens for light microscopy (LM) were fixed in 10% formalin and Bouin solutions, decalcified in EDTA solution and dehydrated in series of ethanol. The samples were embedded in paraffin; sections of 7 micrometers thickness were mounted and stained in Haematoxylin-eosin, Azo-Carmin and Picrosirius for analysis of the muscle and collagen fibers bundles. For the transmission electron microscopy (TEM), the specimens were fixed in modified Karnovsky solution containing 2.5% glutaraldehyde and 2.0% paraformaldehyde in 0.1M sodiun phosphate buffer solution and posfixed in 1% osmium tetroxide solution for 2 hours at 4 °C. The dehydration was made in increasing series of alcohol and embedded in Spurr resin. The grids were observed in transmission electron microscope Jeol 1010. For scanning and transmission electron microscopy, the samples were fixed in modified Karnovsky solution and treated in sodiun hydroxide for 3 to 4 days at room temperature and examined in a scanning and transmission electron microscope. Results: The light microscopy (LM) showed that muscle fibers of medial pterygoid muscle are attached to the bone tissue at the medial surface of the mandible through connective tissue bundles forming several groups. The sections examined with polarized light revealed the presence of type I and III collagen fibers. Observations at the transmission electron microscopy (TEM) revealed the nucleus localized in the periphery, the sarcomeres and groups of mitochondria localized in the inner area and interior of sarcoplasma. It is clear that the sarcolema lamina is attached to the sarcoplasma and clearly shows the presence of a basal lamina followed by a collagen fibers bundles. The capillaries can be seen near the muscle fibers insertions at the bone surface presenting diameters that varied from 3 to 4 micrometers, evidencing the presence of caveolae ans cell junctions and projections.The miofibrils bundles and mitochondria crests are revealed also in the inner area of the sarcoplasma. Through scanning microscopy (SEM) the insertion of the medial pterygoid muscle in the medial surface of the mandible could be noticed as well as the collagen fibers bundles from the bone tissue. The longitudinal muscle fibers were revealed and strias could be seen at higher magnification. The connective tissue that constitutes the endomisium was noticed when the specimens were treated with NaOH. We observed the muscle fibers inserting on the mandible through collagen fibers at the osteotendinous junction. We observed that muscle fibers presented different diameters and the peniform aspect of the muscle. The aspects seen in the rat with ageing are very similar to the ones seen in the adult rat.