Contribution for the oligodendrocytes morphology study using confocal microscopy technique

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Important anatomic and fisiologic observations concerning the Nervous System (NS) have been described since Rufus of Ephesus (B.C 110-180). The neural tissue comprises, basically, two types of cells: the neurons and the glial cells or neuroglias, that distinguish from each other by the origin, structure and functions. The neuroglia englobes cells that occupy spaces among neurons, carrying out sustaining, nutrition, covering or isolation, neural activity modulation and defense functions. The neurons have a complex morphology, a variety of formats and sizes and are related to neuroglias as in the Central NS (CNS) as in the Peripheral NS. These cells are the most frequent ones in the neural tissue and the proportion between neurons and neuroglias vary from 1:10 to 1:50 (MACHADO, 2002). In the CNS, the neuroglia comprises astrocytes, oligodendrocytes, microgliocytes and ependymal cells. The complexity of the NS is known in the literature, so the aim of this study was to morphologically analyse cells from neuroglias of the spinal cord (SC) so as of the encephalo of small-sized animals (Wistar rat), contributing for the morphological study in this species, in order to emphasize oligodendrocytes aspect and function from optic technique for high-resolution images obtention: the confocal microscopy. Fragments from SC and encephalo fragments of ten healthy rats were collected, fixed and processed for the inclusion in paraffin. After semi-serial microtomy, two glass-slides were made for each animal (one histological cut for SC and another one for the encephalo), impregnated with different markers of confocal microscopy for glial cells (oligodendrocytes). The histomorphologic aspects of these cells were assessed. Oligodendrocytes morphologic features of SC from rats expressed similarity between these cell populations of their encephalos. There was conformity concerning the irregularity of cytoplasmatic prolongaments, causing great variation in the shape and size. The oligodendroglia revealed round cells bodies, with non-visible cells nuclei. The optical confocal microscopy showed to be appropriate for the oligodendrocytes morphological analysis. The oligodendrocytes are found both in brain white matter and cortex gray matter and are the most copious glial cells from brain white matter (LEBOFFE, 2005). The oligodendrocytes surround axonal segments and are the myelinating cells of the CNS. The oligodendroglia looked like the illustrations from Di Fiore et al. (1982), when describing its round cell body.