

Influence of aging on peripheral nervous system: a morphological and morphometric study

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It is well known that aging influences several functional and structural features of peripheral nerves (Verdù et al., 2000; Ceballos et al., 1999; Jeronimo et al., 2008). However, the role of these changes in the damage/repair mechanisms occurring in acquired peripheral neuropathies is still unclear.

To this aim, a multimodal, long-term assessment in a mice model would represent an optimal tool to perform experimental neuropathy studies designed to evaluate the role of aging in relationship with a given nerve injury. In this study we used 40 females one-month-old C57B1/6 mice and we followed-up them for fifteen months.

Digital and caudal nerve conduction velocity (NCV) studies were performed monthly to evaluate changes in electrophysiological features; moreover, four animals were sacrificed every two months in order to collect caudal nerve, sciatic nerve, dorsal root ganglia (DRG) and skin for morphological and morphometric analysis.

The neurophysiological assessments showed a remarkable increase of caudal NCV until the age of 9 months and then it remained unchanged until the end of the observation period; in the same period, digital NCV increase was also present although less marked. At the pathological level, both caudal and sciatic nerves showed a decrease in fibres density related with age, whereas axon and fibres diameters tended to increase.

These preliminary data can be considered a first step aiming at creating a background for future studies on the relationship between aging and peripheral nervous system induced damage.

References

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Key words

Aging, peripheral nervous system, morphometric analysis, nerve conduction velocity.