

Calibers and microtubules of nerve fibers: differential effect of undernutrition in developing and adult rats

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Sural nerves of 9-week-old rats undernourished since birth, and of adult rats food-restricted for 27 and 48 days, were studied to explore the effect of severe undernutrition on the caliber and microtubules of axons in growing and non-growing animals. In 9-week-old undernourished rats, the number and caliber of myelinated fibers were normal while the cross-sectional area of non-medullated fibers was 29% smaller than controls. By contrast, in adult undernourished rats the cross-sectional area of myelinated fibers was affected sooner and to a greater extent (-28%) than that of non-medullated fibers (-23%). Regardless of age, in both controls and in undernourished rats non-medullated fibers of equal caliber had similar microtubular content. The same was found in 3- μ m myelinated axons. These findings indicate that food restriction affects proportionately caliber and microtubules of axons. It is proposed that the anatomy of the axon is in a dynamic equilibrium and that microtubules participa