A Review on the Sex Difference in Lipotoxicity in Peripheral Nerves

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acids induced protein expression of BAX and the number of apoptotic cells [19]. By contrast, mice fed the HFD have reduced hepatic autophagy [20]. The HFD inhibits autophagy in cardiomyocytes. Therefore, the mixtures of saturated and unsaturated fatty acids probably induce apoptosis but not autophagy

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Sex hormones, such as estrogen, progesterone, and androgen, contribute to the sex differences in metabolism between males and females and are responsible for sex-specific differences. The pathogenesis of neuropathy is enhanced in the sciatic nerves of male mice fed the HFD. Male mice are more vulnerable than the females to the impacts of the HFD on weight gain, metabolic alterations and deficits of learning, and hippocampal synaptic plasticity. Male rats with diabetes have a higher frequency of neuropathy than female rats with diabetes [21]. Similarly, male mice develop a greater extent of diabetes-induced cognition deficits and peripheral neurovascular dysfunction than female mice [22]. In our recent study, HFD induced apoptosis in the sciatic nerves of males, but not females. Therefore, these indicate that there is a sex difference in peripheral neuropathy.

In ovariectomized females fed the HFD, the levels of the apoptosis-related genes were increased compared to ovariectomized mice fed a normal diet. In contrast, the replacement of estrogen, a female hormone, in ovariectomized mice abolished the HFD-induced mRNA levels of two apoptosis-related genes.Thus, it is assumed that estrogen has prevented the cell damage of central and peripheral nerves.

The Role of Estrogen Receptor Isoform in the Peripheral Nerve Injury by Lipotoxicity

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