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Accelerated aging processes in type I streptozotocin-induced diabetes mellitus in rats.

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Abstract:

Several patterns of neuropathy can be distinguished in DM. In recent years evidence is emerging that DM affects the CNS. Both acute and chronic metabolic and vascular disturbances can impair the functional and structural integrity of the brain in diabetic patients. The emerging view is that the diabetic brain features many symptoms that are best described as brain ageing. The aim of this study is to show that DM accelerates the process of brain ageing.

Methods: Several behavioral (Morris-water maze) and electrophysiological (Extra- and intracellular recordings from hippocampus slices) experiments were performed on streptozotocin-induced DM and aged-matched control rats.

Results: On behavioral testing the aged rats showed deterioration in learning and memory compared to the young animals. Both young and aged diabetic rats showed bad performance in these tests. The aged diabetic animals were the worse. Electro physiologically: The diabetic animals demonstrated defects in long term potentiating (LTP) and depression (LTD) compared to the age- matched controls. In addition, intracellular recording from the pyramidal cells of the hippocampus demonstrated significant differences in the resting membrane potential (RMP), afterhyperpolarization (AHP) and *I*h current. The most significant deterioration in these basic cellular functions were noticed in the aged diabetic animals.

Conclusion: Both behavioral testing and electrophysiological experiments showed that increasing age and diabetes mellitus are sharing the same mechanisms in affecting the brain function. We concluded that diabetes mellitus is a process of accelerated

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