The Effects of Pterostilbene and Resveratrol on The Biomechanic, Biochemical and Histological Parameters in Streptozotocin-Induced Diabetic Rats Gastrocnemius Muscle

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INTRODUCTION: Diabetes Mellitus (DM) is believed to have negative effects such as skeletal muscle atrophy, lower muscle mass, weakness and reduced physical capacity. A great number of studies have reported that antioxidant resveratrol and pterostilbene treatments could enhance the various metabolic disorders associated with diabetes. The aim of this study is to investigate the comparative effects of pterostilbene (PTS) (trans-3,5-dimethoxy-4I-hydroxystilbene) and resveratrol (RSV) (trans-3,5, 4I-trihydroxystilbene) applied at different doses in the treatment of streptozotocin (STZ)-induced diabetic myopathy.

MATERIALS AND METHODS: Eighty rats of Wistar albino species were used. The animals were divided into eight groups (n = 10): control (non-diabetic); diabetic (DM); DM+10 mg/kg PTS; DM+20 mg/kg PTS; DM+40 mg/kg PTS; DM+10 mg/kg RSV; DM+20 mg/kg RSV and DM+(10+10) mg/kg PTS/RSV combination. At the end of the 5-week experimental period, the right gastrocnemius muscles of the rats were examined biomechanically, while the left ones were examined histologically. In addition, blood glucose, serum insulin and malondialdehyde levels were analyzed in blood samples taken from rats.

FINDINGS AND RESULT: The skeletal muscle isometric contraction forces shown a decrease with diabetes were observed to have increased more with PTS antioxidant applications as compared to RSV applications. Blood glucose, serum insulin and malondialdehyde levels in diabetic rats were found to be closer to normal level with PTS applications. When the skeletal muscle electron microscopic images of diabetic rats treated with antioxidants were examined, Those in the mix treatment group were observed to showing better healing in Type-1 DM compared to the other diabetic and treatment groups. We suggest that PTS antioxidant treatments could be a better therapeutic nutraceutical alternative in skeletal muscle diseases coexisted with diabetes compared to RSV treatments.