

Assessment Of Lumbosacral Plexus In Diabetic Neuropathy With Advanced MRI Technique

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Objective: Our goal is to investigate if MRI can classify neuropathy and muscle atrophy severity in diabetics.

Methods: Total of 30 diabetic patients and 8 age-matched healthy controls, who are non-diabetic and not having any neuropathy were prospectively recruited. Patients were pre-classified into 3 neuropathy severity groups that were ascertain through the Toronto Clinical Scoring System (TCSS). MRI 3-Tesla with Diffusion Tensor Imaging (DTI) was performed on the dominant lower limb to evaluate sciatic and peroneal nerves. Post processing images were done to obtain DTI values for each nerve. Axial in-out phase of the calf were used to classify muscle atrophy into severity by using Goutallier classification on the medial gastrocnemius muscle. Patients glycemic control (HbA1c) level were also collected.

Results: MRI DTI was able to detect neuropathy in diabetic patients and it corresponds with chronic degenerative nerve changes ($p=0.001-0.022$). However, it is less sensitive in distinguishing disease severity. We found a significant correlation in muscle atrophy grading in normal and increasing neuropathy severity ($p0.05$).

Conclusion: MRI DTI can demonstrate peripheral neuropathy in diabetic patients and corresponds with chronic degenerative nerve disease. MRI also supports that there is significant muscle atrophy in diabetic neuropathy patients as compared to normal patients. However, both DTI and muscle atrophy assessment technique that we used could not differentiate between the different neuropathy severity groups.