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A new minimally invasive technique to show nerve ischaemia in diabetic neuropathy.

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**AIMS/HYPOTHESIS:** Experimental studies have shown that abnormalities of nerve microcirculation are important factors in the pathogenesis of diabetic neuropathy but there have been few clinical studies. We have applied microlightguide spectrophotometry to measure intravascular oxygen saturation (HbO<sub>2</sub>%) and blood flow in human sural nerve. **METHODS:** We studied ten patients with mild-moderate sensory motor diabetic neuropathy, nine patients without neuropathy and nine control subjects. We took 300 measurements of oxygen saturation under direct visual control through a 1.9 mm rigid endoscope over three regions of the nerve. Spectrophotometric measurements of nerve fluorescence were taken after an intravenous injection of sodium fluorescein and the rate of increase in nerve fluorescence (rise time) was used as an indicator of nerve blood flow. **RESULTS:** Nerve oxygen saturation was reduced in patients with neuropathy compared with control subjects (67.1 +/- 2.2% vs 76.7 +/- 2.1%, p = 0.006). Fluorescein rise time was prolonged in patients with neuropathy compared with the control group (48.5 +/- 7.0 s vs 14.0 +/- 3.1 s, p = 0.001) suggesting impaired nerve blood flow. There was a correlation between rise time, nerve oxygen saturation, glycaemic control and sural nerve sensory conduction velocity (p < 0.01). **CONCLUSION/INTERPRETATION:** The combination of microlight-guide spectrophotometry and micro-endoscopy provides a valuable minimally invasive technique for clinical investigation of nerve microcirculation. We have shown reduced nerve oxygenation and impaired blood flow in diabetic neuropathy and these findings strongly support a central role of microvascular disease in the pathogenesis of diabetic neuropathy.

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