

## COMMENTS AND RESPONSES

### Corneal Sensitivity Is Reduced and Relates to the Severity of Neuropathy in Patients With Diabetes

Response to Dash

**D**r. Dash (1) has correctly identified potential confounders when measuring corneal sensitivity. Accordingly, exclusion criteria in our study were as follows: previous ophthalmic surgery affecting the cornea (including refractive surgery), previous ocular trauma, current use of topical ophthalmic medications, contact lens wear, chronic dry eye, or other ocular disease that can affect the cornea. This information was not detailed in our article (2) as a result of the stringent word limitations of Brief Reports in *Diabetes Care*.

It is true that the Cochet-Bonnet aesthesiometer (CB-E) is unable to accurately measure corneal sensitivity at

low-stimulus thresholds, and we were surprised to find that the CB-E exceeded the capacity of the noncontact corneal esthesiometer (NCCE) to detect corneal sensitivity loss in patients with mild neuropathy (2). Nevertheless, both the CB-E and the NCCE were able to detect clear differences in corneal sensitivity across the broad range of neuropathic severity examined in our study (2). Our finding of a significant relationship between neuropathic severity and corneal sensitivity using these techniques ought not be surprising in view of our previous demonstrations of a significant relationship between neuropathic severity (assessed using conventional techniques of quantitative sensory testing and nerve electrophysiology) and the density of nerves in the sub-basal layer of the cornea (3,4).

We thank Dr. Dash for his interest in our work and his endorsement of our demonstration of the clinical utility of CB-E (2), NCCE (2), and corneal confocal microscopy (3,4) as novel noninvasive ophthalmic markers of diabetic neuropathy.

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#### References

1. Dash SK: Corneal sensitivity is reduced and relates to the severity of neuropathy in patients with diabetes (Letter). *Diabetes Care* 30:e142, 2007. DOI: dx.doi.org/10.2337/dc07-1555
2. Tavakoli M, Kallinikos PA, Efron N, Boulton AJM, Malik RA: Corneal sensitivity is reduced and relates to the severity of neuropathy in patients with diabetes. *Diabetes Care* 30:1895–1897, 2007
3. Malik RA, Kallinikos P, Abbott CA, van Schie CHM, Morgan PB, Efron N, Boulton AJM: Corneal confocal microscopy: a non-invasive surrogate of nerve fibre damage and repair in diabetic patients. *Diabetologia* 46:683–688, 2003
4. Quattrini C, Tavakoli M, Jeziorska M, Kallinikos P, Tesfaye S, Finnigan J, Marshall A, Boulton AJM, Efron N, Malik RA: Surrogate markers of small fiber damage in human diabetic neuropathy. *Diabetes* 56:2148–2154, 2007