COMMENTS AND RESPONSES

Increased Matrix Metalloproteinase-9 Predicts Poor Wound Healing in Diabetic Foot Ulcers

Response to Muller et al.

We thank the authors for their comment (1) on our study (2) and we agree that the pathophysiology of diabetic foot ulcers is complex and not well understood. We recognize that we are not the first to establish a potential role for matrix metalloproteinase-9 (MMP-9) in chronic wound healing. However, we report that its measurement in wound fluids from diabetic foot ulcers has predictive value (2). We acknowledge that the study by Muller et al. (3), published in parallel with ours, also describes a predictive role for MMPs, in particular MMP-1–to–tissue inhibitor of metalloproteinase (TIMP-1) ratio in wound healing. We did not report on MMP-1 levels in our study because they were not reliable in measurement, being at the lower limit of detection of our assay, while in contrast MMP-9 is found in considerably higher levels (8- to 10-fold). In our work (2), we found a predictive role for pro- and active MMP-9 and its ratio with TIMP-1 in wound healing outcome, whereas Muller et al. (3) found that pro–MMP-9 had no predictive value.

In conclusion, we concur with Muller et al. that it is increasingly clear that MMPs play an important role in wound healing and that their levels are altered in diabetic wound healing. There are many different MMPs, and their expression and activation will depend on the stage of healing, as well as factors such as bacterial load, treatment, local inflammation, etc. A better understanding of how MMPs are affected in diabetes will permit evaluation of their prognostic value, as well as their utility for treatment targets to improve wound healing rates.

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