Comparison of macro- and micro-lightguide spectrophotometric measurements of microvascular haemoglobin oxygenation in the tuberculin reaction in normal human skin.

Newton DJ, Harrison DK, Delaney CJ, Beck JS, McCollum PT.

Dundee Teaching Hospitals NHS Trust, Ninewells Hospital and Medical School, UK.

The changes in haemoglobin oxygenation (SO2) occurring in the tuberculin reaction in human skin were measured using macro- and micro-lightguide spectrophotometry and the results compared. A significant difference was found between the measurements from the respective instruments, demonstrating that the micro-lightguide technique measures only in the most superficial capillaries. Laser Doppler flux (LDF) and transcutaneous oxygen (tcpO2) measurements were also obtained concurrently. At the height of the reaction, heating did not significantly change SO2 or LDF, showing that the vessels in the skin were maximally vasodilated. Although SO2 was increased in the reaction, tcpO2 decreased. This suggests that the infiltrating cells may present a diffusion barrier to oxygen between the capillaries and the tissue cells. This study has shown that micro-lightguide spectrophotometry gives a local picture of intracapillary oxygen supply, which is useful in elucidating the pathophysiological changes occurring during chronic inflammation.

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