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

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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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