

Medical > In Vivo > Other material

52

Quantification of capillary blood cell flow using reflectance confocal microscopy.

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ABSTRACT

BACKGROUND/PURPOSE: In vivo reflectance confocal microscopy (IVCM) is a new tool for skin microcirculation. However, the measure of quantitative blood cell flow (QBCF) has not been standardized. We studied the inter-investigator and the intra-capillary reproducibility of the manual measure of QBCF on IVCM videos and investigated if a software program might help measure QBCF and be sensitive to vascular occlusion tests. **METHODS:** The inter-investigator reproducibility of the manual QBCF was evaluated on 107 videos. The intra-capillary reproducibility of QBCF measured manually and by 2 semi-automatic procedures based on Image J software analysis was evaluated on 19 capillaries. One of the semi-automatic methods (peaks of luminous intensity) was also used to measure the QBCF during vascular occlusion tests. **RESULTS:** The manual measure did not show a good inter-investigator reproducibility (Pearson's coefficient <0.5). The 'peaks of luminous intensity' method was found to have a good intra-capillary reproducibility and to be sensitive to vascular occlusion. **CONCLUSION:** Differently from the manual count, the count of peaks of luminous intensity by Image J software seems to be promising to measure QBCF. The future is to create software allowing for real-time measure of the QBCF based on the peaks of luminous intensity inside the capillaries recorded by IVCM.