

Evaluation of microcirculation by Sidestream Dark Field: Impact of hemodynamic status on the occurrence of pressure artifacts

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Objective: Aims of the study were to evaluate the influence of hemodynamic status on pressure artefacts and the impact of pressure artefacts on microcirculatory flow.

Methods: Sublingual microcirculation was assessed using Sidestream darkfield device in 7 anesthetized piglets in which variations in blood pressure have been induced pharmacologically. For each video, a pressure score of 0, 1, or 10 was assigned for the category "pressure artefacts" of the "microcirculation image quality score". Videos with a pressure score of 0 and 1 were considered as "passing videos". The videos with a score of 10 were considered as "failing videos". Multivariate logistic regression models and multivariate linear mixed models with individual random effects were used.

Results: As blood pressure decreased, the probability of obtaining a "failing video" increased ($P = 0.0008$). After exclusion of the "failing videos", only videos rated 0 or 1 remained. Pressure score influenced significantly ($P < 0.00001$) the probability of obtaining abnormal flow. Pressure score was associated with more heterogenous flow ($P < 0.00001$).

Conclusion: Probability of obtaining pressure artefacts during recordings of microcirculation videos was higher when the arterial pressure was low. The presence of even acceptable pressure artifacts was associated with a slowdown and heterogeneity of the flow.