Cutaneous microcirculation in hypoxemic patients suffering from severe cardiopulmonary disease. A laser Doppler study.

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Abstract: The microcirculation is of outmost interest in the exchange of nutritional substances and oxygen between the blood and the different tissue cells. In the patient suffering from severe hypoxemia is important to determine the degree and severity of the blood flow changes in the microvessels. The laser Doppler flowmetry is a non-invasive, easy method used for the semi-quantitative assesment of the microcirculation. The laser Doppler fluxmeter (PeriFlux PF4000, Perimed, Stockholm, Sweden) records both the nutritive flux from the papillary capillaries and the thermoregulatory flux from the arterioles. We examined 10 cor pulmonale patients (mean age 66,4 years, ranging from 51-81 years) with severe hypoxemia determined by whole body pletysmography and arterial blood oxygen saturation and 10 age and habits matched controls. All the subjects were smokers (more than 5 cigarettes/day). Microvascular flow was studied at rest (20 minutes room temperature) and following 4 minutes of brachial artery occlusion performed using a blood pressure device cuff. The post occlusion reactive phase was measured 20 minutes at room temperature. The laser Doppler probes were positioned on the left hand ring finger nailfold and left forearm with continuous skin temperature measurement at both sides. We did not measure statistically significant skin temperature differences between the two groups. The mean rest flow in the patient group was extremely low (X=19.8 P.U.) and the procentual change between the rest flow and the peak flow was also very minor (mean X=20.5% varying from 0% to 60 %). The difference in these two parameters between the two groups was statistically significant.

In conclusion more large studies are needed to determine the role of laser Doppler flowmetry in establishing the degree of severity of the various cardiopulmonal diseases.