

Prize Poster 4

Limitations of Transcutaneous Oximetry in the Evaluation of Vascular Status in Diabetic Patients with Critical Limb Ischemia Before and After Endovascular Treatment

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Aim: To evaluate the role of transcutaneous oximetry in diabetic patients with critical limb ischemia (CLI) after percutaneous transluminal angioplasty (PTA) as follow-up measure. **Methods and materials:** 122 diabetic patients with CLI were involved in the study (63 women, mean age - $64,4 \pm 10,1$, mean HbA1c - $8,3 \pm 1,3$, mean duration of diabetes $17,2 \pm 10,9$ years, diabetes type 1/2 - 16/106). Coronary heart disease was identified in 67(54,9%), myocardial infarction in anamnesis 33(27%), stroke 25(21%) patients. Diagnosis of CLI based on recommendation of TASC II. All patients were underwent PTA of lower limbs arteries. Patency of arteries of lower extremity was evaluated by duplex ultrasound (DU) during whole follow-up period. Transcutaneous oxygen tension (T_{cp}O₂) measurements were performed prior PTA and 3 days, 1 and 3 months after PTA during follow-up. **Results:** Peripheral arterial disease 3 category according Rutherford classification revealed in 23(18,8%), 4 category - in 15(12,2%), and 5,6 category in 71(58%) patients. 13(10,1%) patients with CLI were asymptomatic. Occlusive lesions of tibial arteries exclusively were identified in 46(38%) patients; simultaneous occlusive lesions of femoral and tibial arteries were in 72(59%) patients. The mean level of T_{cp}O₂ before PTA was $14,3 \pm 8,5$ mm Hg, on 3rd day after PTA - $34,1 \pm 11,0$ mm Hg, 1 month after - $32,3 \pm 11,3$ mm Hg, 3 months after - $32,8 \pm 11,8$ mm Hg. Low values of T_{cp}O₂ (<20 mmHg) after angioplasty were remained in 18(14,7%) patients: in 8 of them - transient lower limb edema developed after femoro-popliteal angioplasty; in 4 cases low oxygen tension was caused by severe infection; in 6 patients there was PTA failure. They underwent re-interventions in early postoperative period. 8 patients with transient lower limb edema had low oxygen tension 1 month after PTA - $13,3 \pm 2,5$ mm Hg, while there was an adequate blood flow documented by DU. The mean value of T_{cp}O₂ in all these patients increased to mean $28,9 \pm 3,8$ mm Hg 3 months later. It was accompanied by reduction of edema and infection. **Conclusion:** Measurement of T_{cp}O₂ is useful procedure in evaluation of the effectiveness of PTA in early and late postoperative period in diabetic patients. However some of the limitations of method should be considered transient lower limb edema and severe infection. Combined noninvasive diagnostic methods should be used for the assessment of effectiveness of endovascular procedure in diabetic patients with CLI.