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## The influence of antioxidant therapy for transdermal effort of oxygen in patients with diabetic angiopathy of lower extremities

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### Abstract

Diabetes mellitus (DM) is one of the commonest global noncommunicable health-care problem, carrying a predicted pandemic score of 366 million population by 2030. One of the major complications of DM is the development of critical feet ischemia. The objective of this study is analysis of the influence of antioxidant therapy for transdermal effort of oxygen in patients with diabetic angiopathy of lower extremities. 154 patients with diabetic angiopathy of lower extremities and obstructive injure of different arterial segments were observed. We proposed of additional prescription of reamberin on coplex treatment of critical ischemia of lower extremities in patients with diabetes mellitus type 2 with the aim of oxygen effort on tissues normalization and decreasing of hospital staying.

**Keywords:** Diabetic angiopathy, antioxidant therapy

### Introduction

Diabetes mellitus (DM) is one of the commonest global noncommunicable health-care problem, carrying a predicted pandemic score of 366 million population by 2030 <sup>[1]</sup>. One of the major complications of DM is the development of diabetic foot ulcer (DFU). International working group on diabetic foot has proposed neuropathy and angiopathy as the main risk factors for development of DFU. Role of these risk factors has been explained biomechanically and biologically <sup>[2]</sup>.

Treatment of diabetic foot syndrome involves multidisciplinary approach in achieving euglycemia and needs serial debridement/ disarticulation/ amputation as per the grade of ulcer/ foot gangrene, else it could be lifethreatening to the patient <sup>[3]</sup>.

The clinical methods of diagnostics often can't imagine full picture of magisterial vessels disturbances, morphologic changes in lower extremities tissues and collateral blood supply status. Instrumental methods are alternative. With the aim of objective evaluation of leg vitality in case of critical ischemia some authors proposed of transdermal effort of oxygen test. The objective of this study is analysis of the influence of antioxidant therapy for transdermal effort of oxygen in patients with diabetic angiopathy of lower extremities.

**Material and Methods.** 154 patients with diabetic angiopathy of lower extremities and obstructive injure of different arterial segments were observed. Only DM 2 type patients with impossibility of reconstructive operative treatment were included to this study.

The chronic arterial insufficiency of lower extremities was detected by R.Fontaine classification <sup>[4]</sup>. We used of traditional clinical, laboratory and instrumental methods of investigation.

The regional microhaemodynamics was evaluated by transdermal oxygen effort ( $pO_2 - TcpO_2$ ) by TCM-2 Radiometer (Denmark). We measured of basal  $TcpO_2$ ; minimal  $TcpO_2$  and maximal  $TcpO_2$ . The functional reserve was calculated by odds.

**Results and Discussion.** The stage of basal  $TcpO_2$  (evaluated by transdermal oxygen effort method) was decreased with stage of chronic arterial insufficiency (CAI) growth. It's true, because basal  $TcpO_2$  is an important value of CAI stage in patients with gangrene and ischemia of diabetic foot. During reactive hyperemia test minimal  $TcpO_2$  was similar like in control group. But in CAI IVa stage this value was lower than reference range.

The time of basal level of  $TcpO_2$  renovation was significant longer. It's connected with main blood supply disturbances and strong morphologic changes in vessels' walls.

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We observed of insignificant decrease of basal TcpO<sub>2</sub> in patients with CAI IVa stage.

Our results are suggested that in patients with CAI IVa stage the compensatory mechanisms are gaunt and using of vasodilators at this case will be ineffective.

That's why the most important method of conservative treatment in such patients is prescription of antioxidants and antihypoxants.

The second stage of our investigation was evaluation of novel antihypoxic medicine (reamberin) efficacy in patients with critical diabetic lower extremities ischemia.

During complex therapy of such patients we added of i.v. injection of reamberin in daily dose 400 ml. The term of this medication usage was 7-9 days.

All patients were divided into 2 groups: 80 patients (control group No 1) were received of traditional medication regimen; and 74 patients (main group No 2) were received reamberin additionally.

At the end of 7 day of treatment the basal level of oxygen effort was at the margin of critical ischemia (28.7 mm Hg) in control group, but significant higher in main group (36.5 mm Hg). It's of high efficacy criterion of reamberin.

After reactive hyperemia test we founded nothing changes in all observed groups. we concluded, that any medications can't influence for vessels' walls rigidity and maximal oxygen effort in tissues.

Thus, antihypoxant reamberin improves of tissues' oxidation by influence for basal oxygen effort.

During analysis of treatment efficacy of diabetic angiopathy we concluded, that quantities of operative treatment in all observed groups was similar. During hospital treatment period reoperations were made in 13.3% patients of control group and in 5.0% patients of main group only. In patients with additional prescription of reamberin we observed of middle term hospital period decreasing (18 days vs 22.8 days).

## Conclusions

We proposed of additional prescription of reamberin on coplex treatment of critical ischemia of lower extremities in patients with diabetes mellitus type 2 with the aim of oxygen effort on tissues normalization and decreasing of hospital staying.

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