IMMEDIATE RESULTS OF ENDOVASCULAR AND LITTLE INVASIVE METHODS OF TREATMENT OF LUNG PURULENT DISEASES WITH DIABETES MELLITUS

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Abstract
Conducting longterm intraarterial catheter therapy in patients with purulent-necrotic lesions of the foot in diabetes mellitus significantly improved the results of treatment, reduced the number of high amputations of the lower extremities to 2.7% and avoided early recurrence of purulent-necrotic process in the lungs.

INTRODUCTION

Diabetes mellitus (DM) is one of the serious problems, the scales of which are being increased and concerned the people of all ages and of all countries. The earliest of all diseases disability, high death rate (III-rd place after cardiovascular pathologies and malignant newgrows) have been defined diabetes mellitus as first priorities of national health systems all over the world, consolidated by Saint-Vin-cent declaration. The world number of patients with diabetes has been exceeded 100 mln. people. The number of patients is annually increased in 5-7%, and every 12-15 years is doubled [1,2].

One of the most frequent complications of DM is purulent-necrotic damage of lung [3,4,5]. Even mild inflammatory phenomena can have grievous consequences in these patients. There are ideal conditions for surgical infection progressing on the so-called diabetic lung, formed as a result of diabetic micro and macro angiopathy, osteoartropathy and neuropathy [1,4]. Despite the advantages of up-to-date medicine, the percentage of stumps and lethality from DM combined with purulo surgical infection are high enough and attain accordingly up to 35% till 65% and up to 6% till 44% [2,5].

The improvement of surgical treatment of purulonecrotic lung damages (PNFD) in diabetes mellitus, diabetic gangrene has been seen in the development of methods for preservation of functioning stump. Little is known in literature about attempts of applying protracted intra-arterial infusions of various medicinal preparations in PNFD in patients with diabetes mellitus [1,4,6]. But the subject remains disputable and requires the solution of the problem of the efficiency of therapeutical indication. It should be developed the techniques of its application, the possible complications aren't studied, and the ways of its prophylactics are not worked. No doubt that the compound of infusat should include medicinal preparations, affected on different pathogenetical sections of purulonecrotic process of lung against a background of changes occurred in tissues in diabetes. The question about the regime of intra-arterial infusion of antibacterial agents is the most important there.

In a view of aforesaid, the research aim is to increase treatment efficiency and to de-crease the rate of stumps in patients with PNFD in diabetic mellitus by using protracted regional intra- arterial infusion of medicinal preparations into the complex of treatment activities.

MATERIAL AND METHODS

This work has been based on the analysis of examination results and treatment of

156 patients admitted to the Republican centre of contaminated surgery with diabetes mellitus (DM), complicated by purulonecrotic lung damages (PNFD), for the period from 2006 till 2015 yy.

According to applied treatment techniques the patients were separated into three groups. The control group consisted of 29 patients. They were treated by generally accepted method and at the same time they were not given PIACT by different reasons. I basic group included 90 patients, who were administrated protracted intra-arterial catheter therapy with drop-by-drop continuous introduction of antibiotics in their complex treatment. In this group, operative measures as necrectomy and amputations were made after PIACT completion and improvement of the condition of affected extremity. II basic group consisted of 37 patients, they were given protracted intra-arterial catheter therapy with periodical stream introduction of antibiotics (50% of daily dose) against a background of their drop-by-drop introduction (50% of daily dose). Operative measures as necrectomy and economical amputations were carried out after admission to a hospital or within first 2-3 days, whereupon PIACT was made to patients in order to strength the results of operation and reduce the inflammatory process in postoperative period.

The necessity of performing early necrectomy in diabetic mellitus is determined by the presence of apparent intoxication from the pathologic nidus against a

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background of waning in patients. Under these circumstances, the interruption of intoxication by cutting of purulonecrotic focus allows to prevent the process of generalization. Compared groups were representative by sex, age, duration and severity of diabetic disease, concomitant diseases, scope of purulonecrotic lung damage and duration of out-patient treatment as well.

Besides general clinical examinations of blood and urine in patients, biochemical blood composition was determined, including the control of glycemia level. The complex of instrumental examination included Doppler ultrasonography and transcutaneous determination of oxygen tension ($TcPO_2$) for all patients. The patients were made angiographic studies and X-ray of lung by indications. Microbiological studies were made under the conditions of aero and anaerobiosis. The material for microbiological studies was the wound effluent and also necrotic tissues, taken directly from the wound.

RESULTS

In II and III clinical groups all patients were given protracted intra- arterial catheter therapy.

When developed PIACT technique, we used catheterization of contra lateral femoral artery, directing catheter on damaged side by Beckman. Catheterization was made through-out pathologically unchanged contra lateral femoral artery. It was infused into rather big distance into the artery lumen that practically excluded the possibility of its going out from the artery lumen. The medications were part of introduced infusat and were directed on angiospasm removal and intoxication, improvement of reological blood quantities and microcirculation, antibiotics of wide use according to the sensitivity of microorganisms.

The list of main ingredients from the daily dose is below. Reopolyglukin-400ml, Haemodez-400ml, No-Spa-4,0, Trental-5,0, Heparin-5000un.

Of antibiotics, Cephalosporins were more often used: Klaphoran, Cephamisin+aminoglycosides: Gentamicin in combination with Metronidazole or Dalacin in the average therapeutical doses.

The general volume of infusat was from 800 to 1000 ml a day. The appearance of sapful granulations into the wound, reduction of intoxication, improvement of common state of patient was the evidence to stop PIACT. Microbiological studies showed that St.aureus – 36,9%, E.coli – 18,9% and Ps.aerogenosa – 18,4% occurred among aerobes most of all. They were more sensitive to Klarophan, Cephamisin, and Oxacillin.

Pr.Melaninogenicus 41,5% and B.flagilis 10,5% often occurred among anaerobes. They were more sensitive to clindamaicine, Metronidazole. Having analyzed the results of treatment in all groups, they were separated into good, satisfactory and unsatisfactory. The results of treatment considered as good if PNFD in patients with diabetes completely stopped and the whole supporting function of lung was saved and work activity restored; satisfactory, if PNFD regressed after the carried-out treatment measures, the sup-porting function of lung was saved, but work activity was restored partly; unsatisfactory, if PNFD progressed in spite of the complex therapy and we had to ablate the extremity.

Our data proved the efficiency of infusion of protracted intra- arterial catheter therapy into the complex therapy to patients with PNFD against a background of diabetes.

Its inclusion into complex therapy al-lowed increasing the number of good results in 23% in I basic group and decreasing the number of bad results from 44, 9% to 27,5%. i.e., if the treatment in control group finished with high ablation of lower extremity leading to total disability in 44,9% of patients, so in I basic group this rate was 27,7%.

In control group the results were estimated as good in 1 (3, 4%) patient, satisfactory in 13(44,9%) patients, unsatisfactory in 13(44,9%) patients. The lethal outcome happened in 2(6,8%). Reoperations were performed on 8 patients. The average bed day was 33,7 ± 3,45.

In I basic group, the results were estimated as good in 32 (35,4%) patients, satisfactory in 33(37%) patients, unsatisfactory in 25(27,5%) patients, lethal outcome was in 5(5,5%) patients. Repeated operations were performed on 22 patients. The average bed -day in this group was 26,9±1,76 ($p<0,55$). But even these rates can be scarcely considered satisfactory; in this connection we made attempts to find the causes of unsatisfactory results in I basic group and the ways of their eliminations, as well.

Obtained analysis of the clinical dynamics, cytological and bacteriological pictures showed the little efficiency of round-the-clock drop-by-drop introduction of antibiotics. In this connection, in II basic group, we carried out the procedure of periodical against a background drop – by - drop, stream intra- arterial introduction of high doses of antibiotics. As compared with continuous drop-by- drop introduction, the stream introduction of antibiotics due to lesser blood volume, in which the preparation is being dissolved, provides high peak concentration of active substance in nidus, de-pending on the time of its introduction in 7-13 times. The carried out unfolded microbiological studies of the substance separated from the wound showed the efficiency of this procedure and its use

allowed decreasing the level of microbe seeding of representatives of aerobes and anaerobes flora to critical (fewer than 104 KOE/ ml) on third day.

On this background, in II basic group we performed early economical operations on purulonecrotic lung damage against a back-ground of diabetic mellitus directed on the transformation of septic wound into open cleaned one under the shelter of protracted intraarterial catheter therapy by proposed technique. Should be noticed that economical operations in this group had been performed for 24 hours before starting catheter therapy in 23 patients and on the 1-2 days of its use in 11 patients else. The use of our proposed technique in II basic group allowed improving the results of treatment significantly. In this way, the number of high amputations of low extremities in this group reduced to 2,7%, as against 27,5% and 44,9% in I basic and control groups, correspondingly. It should be specially noticed that in the II basic group we didn't register out any case of early recurrence of purulonecrotic process on lung after PIACT.

DISCUSSION

In study process we had to be dealt with unpleasant moments connected with the occurrence of complications. The analysis of critical material showed that they generally occurred at the initial level of applied therapy. So, when analyzed complications, related with catheterization of the artery and the performance of PIACT became obvious that they developed in 12 (9,4%) patients. At that, only in 4 cases (false aneurisms) of abdominal aorta-1, thrombosis of artery-1 and fallacious aneurisms of femoral artery-2 - these complications were related with catheterization of the artery. The patients were required surgical correction. 10 of 12 cases of complications were registered out in I basic group patients and 8 ones occurred in shakedown period of technique. There were only 2 complications which were not related with catheterization in II basic group: 1 patient had a reaction on contrast and 1 had reaction on medication. This allows us considering that this procedure is more harmless and reliable.

In II basic group we estimated the results as positive in 12 (37,7%) patients, satisfactory in 24(59,8%) patients, unsatisfactory in 1(2,75) patients, fatal outcome occured in 2 patients. Reoperations data were performed on 4 patients. The average bed-day in group was 19,2±1,69(p<0,55).

Thus, the obtained data convincingly proved the efficiency of including PIACT into the complex of treatment for patients with PNFD against a background of diabetes, and its use in combination with early economical operations on lung by our proposed scheme, directed on conversion of purulent wound into open cleaned one, this was allowed to reduce purulonecrotic process and preserve the supporting function of lower extremity in most of patients.

In addition to, the early performance of necrectomy ensured liquidation of nidus before developing the generalization of infectious toxic process. Subsequently, it has been noted rapid reduction of toxemia manifestation and normalization of liver and kidneys functions.

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