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CURRENT APPROACHES TO DIAGNOSIS, COURSE AND TREATMENT OF ACUTE NECROTIZING PANCREATITIS

Abstract. The paper presents the modern principles of diagnosis and treatment of acute necrotizing pancreatitis. In case of very severe clinical course of acute necrotizing pancreatitis and enzyme shock, early primary intravenous infusion of Gecoton® solution is recommended, thus ensuring the achievement of rapid and stable volemic effect.

Key words: acute pancreatitis, infusion, monitoring, Gecoton®.

Despite numerous investigations into the pathogenesis and a large-scale clinical implementation of pathogenically substantiated conservative therapy regimens and up-to-date high-technology methods of surgical invasion, no principal improvement of the treatment results are seen to date [4, 6, 8].

An immediacy of the problem of acute necrotizing pancreatitis in Ukraine, in medico-social terms, is conditioned by an expensive conservative therapy, high incidence of repeated multiple surgical interventions, unsatisfactory results of surgical treatment, high level of postoperative lethality and incapacitation, especially among persons of an active working age [1, 4 – 7]. All of this translates into the topicality of researches directed at the development of new and optimization of the existing diagnostic/curative approaches in acute necrotizing pancreatitis.

Objective of the research is to develop new and optimize the existing approaches to diagnosis, to prognosticate the course and treatment of acute necrotizing pancreatitis and to evaluate the efficacy of their clinical use.

Materials and methods

Participating in the research were 158 patients having different forms of acute necrotizing pancreatitis.

The issues of high-informative diagnosis, reliable prognostication and adequate surgical treatment of acute necrotizing pancreatitis and its complications is one of the challenges of a contemporary abdominal therapy [1, 5, 9, 12]. The worldwide trend towards a steady increase in the incidence of this pathology draws permanent attention of both the domestic and foreign scientists to the solution of this complex problem [4, 6, 7, 11].

Among them there were 94 (59.5%) men and 64 (40.5%) women. An average age of patients amounted to 47.55 ± 1.48 years.

Morphologic forms of acute necrotizing pancreatitis were classified as follows: focal sterile pancreatic necrosis – 62 (39.2%) persons, focal infected pan-

creatic necrosis – 30 (19.0%) persons, common sterile pancreatic necrosis – 29 (18.4%) and common infected pancreatic necrosis – 37 (23.4%) persons.

Patients were divided into two groups – the control and study ones. The control group was composed of 66 patients, who were treated according to the unified clinical protocols of providing medical aid to patients with different forms of acute necrotizing pancreatitis [3]. The study group included 92 patients in whom the tried-and-tested approaches to optimizing comprehensive treatment of acute necrotizing pancreatitis were used.

All patients underwent an integrated analysis of the clinical laboratory-instrumental parameters inherent in acute necrotizing pancreatitis, including as an addition, evaluation of the results of the best practices in spectrophotometric and photoluminescent diagnosis (patents for utility model No. 66933, No. 62667, No. 62380).

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Statistical relationship between the values of the indices obtained was checked by determining the Student and Fischer tests.

Results and discussion

When estimating the severity of patients' condition as of the date of their hospitalization – via using APACHE and SAPS II scores – it was found that the values of the above indices in 64 (69.6 %) persons from the study group were associated with severe or very severe variants of acute pancreatitis course, for which cause they were primarily hospitalized into the departments of reanimation and intensive therapy. Other 28 (30.4%) persons with the signs of moderately severe acute pancreatitis were hospitalized into the surgical department.

Traditional approaches to optimization of diagnosis, prognostication of the course and treatment of acute necrotizing pancreatitis rest on comprehensive implementation of the principles as follows.

Principle of early aggressive infusion therapy consists in carrying-out of the intensive therapy complex with adequate fluid resuscitation within the first day [2]. During this time, patients were given intensive infusion therapy in a dose of 40–50 ml/kg with infusion rate of 50–60 drops/min. So, an average infusion volume within the first 24 hours accounted for 3–5 l against the background of forced diuresis. The aforementioned approach corresponded with the approaches suggested by C. Bassi, who, with account of a rampant development of pathomorphologic impairments in the pancreatic parenchyma, points to a 12-hour window for the possibility of making an efficient surgical intervention [2, 10].

It is to be expressly noted that in the development of very severe clinical course of acute necrotizing pancreatitis and enzyme shock, early primary intravenous infusion of Gecoton® solution by “Yuria-Pharm” pharmaceutical company (Ukraine) was carried out. This choice was because a pharmacologic effect of drug Gecoton® is based on efficient potentiating impact of the balanced, adapted to the blood plasma hypertonic crystalloid and modern colloid (HES 130/0.4 in reduced concentration – 5%). Upon availability of acute necrotizing pancreatitis, this enabled a rapid and stable volemic effect to be achieved.

Principle of de-escalation lies in the primary prescription of maximally dosed pancreatic secretion inhibitors (sandostatin, octreostatin), proteolytic enzymes inhibitors (contrykal, contryven, gordox) and the last generation broad-spectrum antibiotics (Maxicin, Leflocin + Ornigil by “Yuria-Pharm” pharmaceutical company).

Principle of combined and separated prolonged anti-enzyme therapy lies in combination of various routes of administering protease inhibitors for a long time. On the base of identifying the leading routes to translocate

activated pancreatic enzymes and mechanisms of pancreatogenic hyperenzymemia, we proposed to perform prolonged (at least for 7 days) intravenous (peripheral vein + subclavian vein + portal vein) and endolymphatic (lymphatic node of the right inguinal site) ant-enzyme therapy under the best practice procedures (patents for utility model No. 62364, No. 66673). With that, the rules of permanent maintenance of effective protease inhibitors concentration were observed, this being achieved via their continuous administration by dint of infusion pump.

Principle of parallelism rests on the use of the full range of medicinal agents since the first hours of hospitalization, not awaiting the results of efficacy of any method alone (antisecretory therapy, extracorporeal detoxication, surgical invasion, etc).

Principle of specific monitoring. As a result of our research as of the date of patients' hospitalization, the following indices were the most specific laboratory-instrumental manifestations of acute necrotizing pancreatitis: blood trypsin > 15.3 IU, blood lipase > 196.0 U/l, blood amylase > 26.0 mg/s • l, α_1 -blood antitrypsin < 10.0 m μ mol/l, α_2 -blood macroglobulin < 1.10 g/l, blood procalcitonin > 1.7 ng/ml, urine amylase > 178.0 mg/s • l, APACHE score > 16 points, SAPS score > 21.0 points, MODS score > 19.0 points, SOFA score > 13.5 points, Balthazar index > 3.3 points, blood plasma optical density < 0.48 U, shift of the blood plasma fluorescence maximum intensity per wavelength λ < 467 nm.

As a result of the primary diagnostic laboratory-instrumental screening, 77 (83.7 %) patients in the study group revealed 9 and more diagnostic markers of acute necrotizing pancreatitis. This made it possible to use dynamic evaluation of the aforementioned indices as the basic markers for prognosticating the course of this pathology and assessing the efficacy of its treatment.

Principle of anticipation. Regardless of the existing, commonly recognized by today, approaches as to the advantage of carrying out suspended surgical interventions at the phase of suppurative complications of acute pancreatitis, we propose to use more active surgical tactics. In the absence – within the first three days – of any effect of conservative treatment against the background of negative dynamics in the defined prognostic criteria, we gave the primary surgical invasion (mini-invasive or min-traumatic, as a rule). In so doing, except for the revision, sanitization and abdominal cavity drainage, we created conditions for prolonged omental sac drainage, local medicamental impact on the most affected pancreatic gland sites, and administration of endoportals drugs under the best practice procedures (patents for utility model No. 66673, No.66934, No.62379, No.62364, No.38002 and No 25832). The expedience of this approach is substantiated by its

directivity towards preventing and halting the progress and extension of destructive lesion of pancreatic gland and adjacent tissues, as well as prophylaxis of suppurative complications of acute necrotizing pancreatitis.

Principle of mini-invasiveness and mini-traumaticity.

When making surgical invasions, the advantage was given to mini-invasive (echo-controlled puncture-drained) and mini-traumatic (echo-controlled, video-laparoscopically assisted) methods under the clearly-cut indications. An exception were patients, who during hospitalization revealed probable signs of common purulent pancreatic peritonitis, this being an indication for laparotomy.

Apart from this, under conditions of using in the combined treatment of omento-pancreato-burso – or lumbotomy, observing the principle of low-traumaticity, the secondary revisions of the leised foci, necrosectomy, sanation, and repeated local drainage bringing were performed under the control of a flexible fiberscope (bronchoscope). This enabled the above manipulations to be made even in the hard-to-reach pockets without excessive traumatization of the adjacent tissues.

Principle of sequence (cascadeness). During the first days of the disease development, when it is impossible to prognosticate, how acute pancreatitis will run in the presence of dissociated fluid affusions, their mini-invasive echo-controlled drainage was made. At that, the inserted micro-irrigators were used with the purpose of primary drainage and local administration of anti-enzyme agents, as well as for objective controlling the condition of the affected tissues, this being identified by changes in the exudate nature. In the cases, where against the background of comprehensive acute pancreatitis treating the probable signs of its progressing were noted, we performed video-laparoscopy, revision and sanation of the abdominal cavity and omental sac, whereto, for adequate drainage and prolonged local medicamental impact, specially developed drainage and sorption constructions are brought (patents for utility model No. 66934, No. 62379, No. 25832). In case of purulent-necrotic complications (abscess, pseudo-cyst empyema) the repeated video-laparoscopy was performed, which, depending on the lesion focus location, was finalized by forming video assisted omental sac marsupialization or making mini-traumatic lumbotomy via using the local projection incisions. In case of common pancreatogenic purulent peritonitis development, we performed laparotomy, which, after the main step of surgical intervention (necrosis, sequestrectomia, sanation), according to clearly-cut indications, was finalized with omental sac open drainage or temporal wound closure under the best practice procedures (patents for utility model No. 25280, No. 30930, application for utility model No. 2011 11641).

In the process of eliminating purulo-necrotic lesion of the pancreatic gland and the adjacent tissues, a reverse principle was used – thick drainages were step-by-step replaced with thinner ones, with a gradual removal thereof until the pancreatic fistulae are completely closed.

Principle of individual follow-up lies in a choice of both primary and time-phased surgical invasions, to be determined for each patient individually, taking into account the character of acute necrotizing pancreatitis course, its form, phase, type of complications and many other factors (severity of condition, combined pathology, age, anamnesis, availability of acoustic window, etc.

Principle of prolonged anti-enzyme and anti-bacterial local impact. In order to inhibit aggressiveness of the pancreatic parenchyma and adjacent tissues pathologic lesion, as well as for prophylaxis and treatment of purulo-necrotic complications of acute pancreatitis, we developed new drainage-sorption devices, methods of peritoneo- and vulnerosorption (patents for utility model No. 66934, No. 66654, No. 30930, No. 28280). The latter are characterized by the use of sorbent with the aforementioned ant-enzyme and anti-bacterial properties, this enabling the deleterious action and expansion of the local alteration factors to be effectively prevented.

Principle of highly qualified medical universalism demands from surgeon the profound knowledge of acute pancreatitis pathophysiology, up-to-date regiments of treating this pathology, being skillful both in traditional and low-invasive surgical interventions, to be made under ultrasonographic, endoscopic and roentgen control. That is the current approaches to the treatment of acute destructive pancreatitis demand from surgeon a simultaneous possession of several medical specialties, such as surgery, endoscopy, intensive therapy, ultrasonic and roentgen diagnosis. This enables the integrity of understanding the problems of treatment at its different steps to be properly maintained.

Principle of highly qualified core competence centralization (instrumental accumulation). Modern approaches to diagnosing and treating acute necrotizing pancreatitis dictate the necessity of using new technologies based on the combined use of specialized expensive medical equipment (analyzers of biologic fluids, equipment to carry out genetic investigations, computer tomography, magneto-resonance imaging, endoscopic and roentgen equipment, sets of special instrumentarium, etc). Besides, the necessary condition for implementing the above principles is highly professional surgeon's skill to analytically evaluate changes of many diagnostic and prognostic markers of acute pancreatitis and possession of a broad

spectrum of various surgical interventions (mini-invasive, endoscopic, open). Understandably, a complex combination of the above components needed for an effective treatment of acute necrotizing pancreatitis, is possible solely under the conditions of specialized departments (centers) of highly qualified medical institutions, where such patients must be treated.

Conclusions

To promptly stabilize the condition of patients having acute necrotizing pancreatitis, whose course is complicated due to enzyme shock development, effective are intravenous infusions of Gecoton® solution by “Yuria-Pharm” pharmaceutical company (Ukraine). This enables Gecoton® solution to be recommended for inclusion into the basic comprehensive treatment of such patients.

Combined clinical use of the above principles of diagnosis and treatment of acute necrotizing pancreatitis made it possible to reduce the risk of the development of common pancreatic necrosis by 18%, incidence of the late purulo-necrotic complications and erosive hemorrhages by 35 and 51%, respectively, to diminish the number of repeated surgical invasions by 39%, to accelerate normalization of clinico-laboratory indices by 28%, to cut the duration of in-patient treatment by 25%, to decrease mortality by 24%.

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СОВРЕМЕННЫЕ ПОДХОДЫ К ДИАГНОСТИКЕ, ПРОГНОЗИРОВАНИЮ ТЕЧЕНИЯ И ЛЕЧЕНИЮ ОСТРОГО НЕКРОТИЧЕСКОГО ПАНКРЕАТИТА

Резюме. В статье приведены современные принципы диагностики и лечения острого некротического панкреатита. В случае развития очень тяжелого клинического течения острого некротического панкреатита и ферментного шока рекомендована ранняя первичная инфузия раствора Гекотон®, что позволяет обеспечивать достижение быстрого и стабильного волемического эффекта.

Ключевые слова: острый панкреатит, инфузия, мониторинг, Гекотон®.

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