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Research Article

### "THE ACCELERATED RECOVERY PROGRAM" IN PATIENTS WITH ECTOPIC PREGNANCY

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#### Abstract

**Aim** is to study and to estimate the results of "the accelerated recovery program (ARP)" applying when treating the women with terminated tubal pregnancy. **Materials and methods.** At the core of our experimental investigation was the comparative analysis of the results of the management of the women with an aborted ectopic pregnancy who had been treated in the State budgetary institution of health care in Crimea Republic Simferopol Clinical Maternity Hospital № 1 from 2017 to 2019. We formed 2 groups – an index group (52 women): they had been treated from 2018 till 2018, we made prospective analysis upon "the accelerated recovery program"; and an experimental one (41 women): we performed retrospective analysis; their treatment was made according to the national clinical recommendations. **Results.** "The accelerated recovery program" applying permitted to get an appropriate analgesia level in post-operative period under condition of narcotic opioids refusal and usage of non-steroid analgesics combination. During the entire follow-up period the pain level wasn't more than 4 scores in VAS (Visual Analog scale) ( $p < 0,05$ ). Based on the data analysis of Questionnaire SF-36 it was revealed that the index group life quality level of 36 women (69,2%) corresponded to an increased one at the time of discharge from the hospital. When in the same period life quality level of 31 females (75,6%) from the experimental group corresponded to an average one ( $p < 0,05$ ). Analysis of the recovery period of the gastrointestinal tract motor function showed that 10 (23,4%) women from the experimental group were registered to have nausea in the first day, 8 (19,5%) females had vomiting. Index group patients didn't complain on nausea; vomiting was registered at 2 (3,8%) persons ( $p < 0,05$ ). Restoration of peristalsis and the beginning of gas discharge in index women group started on average in 16,8±2,4 hours; in the experimental one- averagely in 26,5±1,3 hours ( $p < 0,05$ ). First defecation was registered averagely in 32,4±3,1 hours in the index group; in the experimental one it was in about 48,6±2,9 hours after the operation ( $p < 0,05$ ). We see that intestinal functioning restoration was in 1,5 faster in the index group than in the experimental one. An average hospital stay for the index women group was 5,8±1,2 days ( $p < 0,05$ ); for the ones from the experimental group it was 7,1±1,1 days. **Conclusions.** In the course of the investigative work we received the results which proved the possibility and efficiency of "the accelerated recovery program" applying in case of surgical treatment for terminated tubal pregnancy. The use of this technique has allowed to reduce the period of in-patient treatment not due to only early physical, but also psychological rehabilitation after the surgery.

**Key words:** "accelerated recovery program", ectopic pregnancy, terminated tubal pregnancy.

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**INTRODUCTION:**

The reproductive health of the population is perhaps the most important issue of gynecology and obstetrics. According to the scientific medical literature data, the most dangerous gynecological pathology which leads to the reproductive function reduction is an ectopic pregnancy (EP) [1, 2, 3]. There are nearly 50% of the operations about ectopic pregnancy among the urgent gynecological surgeries [4, 5]. It is also known that over the past 50 years there has been a significant increase in the frequency of EP: in the 50-60s of the last century, the incidence of EP was 0,4%, while today it is 2,4%, and in the case of in vitro fertilization - 5% [6]. In the structure of maternal mortality, EP takes the 6-7-th place, which is 2,9-4,7% [7, 8]. The most common is tubal one - 98-99%, which can be interstitial — 2%, isthmian — 12%, ampullar — 80%, fimbrial — 5% [7]. Common causes of EP are acute and chronic inflammatory diseases of the pelvic organs, intrauterine contraception, and external genital endometriosis. One should mention as the separate item the presence in the medical case history the operations on the organs of the small pelvis and, as a consequence, an adhesive disease of the abdominal cavity [9,10]. Based on these data, the conclusion suggests itself that the search for measures to improve the results of surgical treatment of women with EP is an important and relevant objective. And this problem solution will permit to reduce the frequency of the adhesive process development and as a result, to decrease EP frequency.

In recent years, the “Accelerated Recovery Program” referred as “Fast track surgery” in the English literature sources has attracted pushing interest. Using of this program can improve the results of surgical treatment, in particular, to minimize operational stress for the body, to decrease the in-patient treatment periods and, most importantly, to reduce the complications frequency in the postoperative period [11, 12, 13]. This technique was developed by the Danish anesthetist Kehlet in order to reduce the stress response of the body to surgery during planned operations, it included three stages: preoperative, intraoperative

and postoperative ones [14]. The basis of the program is a rational preoperative preparation, minimization of operative approach, use of short-acting anesthetics, refusal of narcotic analgesics, early enteral nutrition, as well as early body activation in the postoperative period. Initially, this technique was used in colorectal surgery, but then it was widely used in general surgery, gynecology, orthopedics, urology, and oncology [15, 16, 17]. Over the last 10-20 years, against the background of the laparoscopic equipment development and pharmacology, this program has undergone many changes. And today, the technique is actively being introduced into the urgent surgical service. Nowadays there are many publications on the successful application of the “accelerated recovery program” not only during planned operations, but also in emergency surgery, gynecology, urology [18, 19, 20].

The impact of the “accelerated recovery program” on the treatment results of the women with EP, in particular with a tubular form is rather interesting and perspective.

**Aim of the research** is to study and to evaluate the results of the “accelerated recovery program” application in the treatment of the women with terminated tubal pregnancy.

**MATERIAL AND METHODS:**

The base of our investigative work is analysis treatment of 93 women with aborted tubal pregnancy who had been treated in the gynecology department in the State budgetary institution of health care in Crimea Republic Simferopol Clinical Maternity Hospital № 1 from 2017 to 2019. Treatment of 52 women from the index group had been made with prospective analysis from 2018 to 2019; 41 women from the experimental group were with retrospective analysis.

Patients’ age was from 19 to 31 years. An average age in the index group was  $22,8 \pm 1,3$  years, in the experimental one it was  $22,1 \pm 1,8$  years. Both groups were representative according to the age.

Treatment for all women involved surgical procedures as soon as possible – removal of the uterine tube, abdominal drainage. Postoperative therapy was directed on elimination of water-salt balance disturbances, relieving of pain syndrome. But index group women were treated with the “accelerated recovery program”. We applied its following elements:

- during pre-operative period:

- **premedication refusal;**
- **prevention of carbohydrate metabolism disturbance:** for this purpose, all women were injected 800 ml of 5% glucose solution intravenously during the preoperative infusion preparation;

- **nausea and vomiting prophylaxis in postoperative period:** in order to achieve this during anaesthetic induction we injected 4-8 mg of dexamethasone and 25-50 mg of metoclopramide intravenously for 30-60 minutes before the end of the operation.

- during intraoperative period:

- **minimal surgical approach and abdominal drainage refusal:** survey video-laparoscopy with further determination of the operation volume was performed to all women from the index group. Wherein laparoscopic removal of the uterine tube was made to all of them. In order to prevent adhesion formation, we performed lavage of the abdominal cavity and injected 50 ml of Mesogel there. Whereas laparotomic approach, uterine tube removal, lavage and drainage of the abdominal cavity was made to all women from the experimental group;

- during postoperative period:

- **targeted infusion therapy:** infusions volume in both groups was determined based on the losses for daily diuresis, perspiration (10-15 ml/kg/per day), discharge volume in the drainage from the abdominal cavity (in the experimental group). In order to solve dehydration problem, we used 0,9 % of saline solution of sodium chloride. Normalization of electrolyte blood composition was made by infusion of Ringer's, Trisolium solutions. Women from both groups were infused 1200±1800 ml averagely during the day. In order to replace deficiency of circulating blood volume we used Reopoliglyukin solution in the volume of 0,5-1 liter per day. This performing infusion therapy was made under the control of laboratory indexes of blood, diuresis and hemodynamic parameters, blood PH was changing situationally depending on obtained indicators. Intravenous infusions of 4% solution of potassium chloride were made starting from the 2-nd day after the surgery and depending on the biochemical parameters of blood of every woman in the postoperative period in order to correct water-salt metabolism. This procedure reduced intracellular potassium deficiency what contributed to the early restoration of intestinal

peristalsis.

- **refusal from narcotic analgesics:** we used non-steroidal anti-inflammatory drugs instead of opioid analgesics to control pain syndrome in postoperative period. In particular it was Paracetamol and Nefopam combination under the following scheme: 100,0 ml of 1% Paracetamol solution was injected intravenously in the first hour immediately after the surgery completing, 2 ml of 1% of Nefopam solution was injected intramuscularly in 1 hour and then 3 times per day. Criteria for analgesic discontinuing in the index group was achieving VAS pain level not more than 3 points. While in the early postoperative period for the experimental group 2 ml of 1% of Promedolum solution was injected intramuscularly to the women immediately after the operation and the following every 6 hours during the first day. After that 2 ml of 1% Nefopam was injected intramuscularly 3 times a day.

- **early enteral nutrition (EN):** all women from the index group were permitted to drink water averagely in 2-4 hours after the operation. On the first day, up to 1 liter of liquid was allowed. On the 2-nd day after the surgery if they had high tolerability (no vomiting and nausea) they were allowed to eat solid food. Comparing to the experimental group where enteral nutrition initiated only after restoration of active intestinal peristalsis and the beginning of gas discharge, averagely it was in 28±4,2 hours after the operation completing.

- **early activation:** time of beginning of the body activity after an operation is an important factor which influences on rehabilitation duration. Women began to stand up and walk in the wards in 4,5±1,6 hours after the surgery completing. Our targeted numbers were when a patient spent 0,5 hour not in the bed during the first day after the surgery and not less than 4 hours during the following days. But in the experimental group women started their body moving activity averagely in 12,1±2,4 hours. This can be explained by the high pain level in the women from the experimental group regarding to the ones from the index group: pain level according to VAS was 4 points in the index women group in 4,5 hours and it was 7 points according to VAS at women from the experimental group in the same period (difference is significant,  $p < 0,05$ ).

Treatment efficacy we evaluated on the base of the clinical data: comparison of pain intensity in the postoperative period, terms of women body moving activity and also on the results of the subjective evaluation of life quality according to Questionnaire SF-36.

We estimated the terms of the restoration of the motor function of the gastrointestinal tract: presence of vomiting and nausea in the

postoperative period, starting date for restoration of active intestinal peristalsis and the beginning of gas discharge, the first stool.

Analgesia level was evaluated on the base of Visual Analogue Scale (VAS) in 2, 6, 12 and 24 hours after the surgery. In order to estimate life quality after the operation on the day of discharge all women from both groups were tested by the Questionnaire SF-36; after which there was computer processing of received data.

Statistical processing of the received data was performed having used the methods of variation statistics with average determination (M), assessment of probability of discrepancies (m), reliability of estimate of changes based on Student's t-test. Significant point was considered to be the difference in average when  $p < 0,05$ .

### RESULTS AND DISCUSSION:

100% of the women from the index group had pain level of 4 points according to VAS in 2, 4, 6, 12 and 24 hours after the surgery. It was an acceptable level in the postoperative period that didn't affect adversely on its course and permitted to start an early body moving activity already on average in  $4,5 \pm 1,6$  hours after the surgery ( $p < 0,05$ ). In 2 hours after the operation 15 (36,9%) women from the experimental group had pain level of not more than 4 points according to VAS but 4 (9,8%) of them had it of more than 7 points. In 4 hours 21 (51,2%) women from the experimental group had the pain level that wasn't more than 4 points; it was more than 4 points at 10 (24,3%) of them; it was more than 6 points at 2 (4,8%) women. In 6 hours 22 (53,6%) women from the experimental group had pain level which wasn't more than 4 points; it was in the range of 4-6 points at 19 (46,3%) of them. In 12 hours 32 (78%) women from the experimental group had pain level not more than 4 points; at 9 (21,9%) of them it ranged from 4-6 points. By the end of the 1-st day pain level wasn't more than 4 points in 41 (100 %) of the women from the experimental group. Therefore, body moving activity in women from the experimental group was possible and started averaging in  $12,1 \pm 2,4$  hours ( $p < 0,05$ ).

As a result of computer analysis of data from the Questionnaire SF-36 it was revealed that life quality level of 36 (69,2%) females from the index group ranged from 61-80% that corresponded to its increased indicator. Test result of 15 (28,8%) women ranged from 41-60 %, that corresponded to its mean value.

While life quality level of 31 (75,6%) women from the experimental group ranged between 41-60%- its mean value. 3 (7,3%) women from this group had

decreased level of life quality – 21-40%, due to low indicators of physical functioning (PF) -  $17 \pm 2,4$ , general health (GH) -  $19 \pm 1,8$  and social functioning (SF) -  $22 \pm 1,4$  ( $p < 0,05$ ). The result of 7 (17,1%) women ranged between 61-80%, that corresponded to an increased indicator of life quality.

It should be noted that indicators of the mental health component of almost all respondents of the index group were rather high, namely social functioning (SF) and vitality (VT) was  $59,3 \pm 2,6$  and  $57,6 \pm 1,9$ ; unlike with an experimental group where SF and VT was  $24,2 \pm 2,1$  and  $25,6 \pm 1,4$  ( $p < 0,05$ ). This fact confirms effectiveness of the application of "the accelerated recovery program" as a technique allowing to achieve not only early physical, but psychological rehabilitation after the operations.

Having analyzed the data about the terms of restoration of the motor function of the gastrointestinal tract, we saw that 10 (23,4%) women from the experimental group were noted to have nausea, and 8 (19,5%) of them were noted to have vomiting during the first day after the surgery. Whereas women from the index group didn't complain on nausea; 2 (3,8%) of them were marked to have vomiting ( $p < 0,05$ ).

Restoration of the intestinal peristalsis and beginning of gas discharge was in 14-20 hours (averaging  $16,8 \pm 2,4$  hours) at the women from the index group; but women from the experimental group had it in 25-30 hours (averaging  $26,5 \pm 1,3$  hours) ( $p < 0,05$ ). First defecation in the index group was noted in 30-35 hours (averaging  $32,4 \pm 3,1$  hours); in the experimental one it was in 45-50 hours ( $48,6 \pm 2,9$  hours) after the surgery ( $p < 0,05$ ). In this case, 7 (17.1%) females needed drug-induced stimulation of the intestine. There was no need for this in the index one. Therefore, restoration of the bowel functioning was in 1,5 times faster in the index group than in the experimental one.

Average length of staying in the hospital of the women from the experimental group was 6-8 days (about  $7,1 \pm 1,1$  days). But it was 5-6 days (about  $5,8 \pm 1,2$  days) in the index one ( $p < 0,05$ ).

### CONCLUSION:

Data obtained by us during the investigation prove possibility and effectiveness of applying "the accelerated recovery program" for surgical treatment of the progressive tubal pregnancy. Application of this technique allowed to achieve:

1. Throughout the period of investigative monitoring the level of pain syndrome in early postoperative period wasn't more than 4 points among the women from the index group that



contributed to the beginning of early activation already in 4,5±1,6 hours after the surgery. In the experimental group it was possible in about 12,1±1,4 hours ( $p<0,05$ ).

2. As a result of computer analysis of data from the Questionnaire SF-36 it was revealed that life quality level of 36 (69,2%) women from the index group ranged from 61-80% that corresponded to its increased indicator. It was also revealed noted that indicators of the mental health component of almost all respondents of the index group were rather high, namely social functioning and vitality was 59,3±2,6 and 57,6±1,9; unlike with the women experimental group where social functioning and vitality was 24,2±2,1 and 25,6±1,4 ( $p<0,05$ ). This fact confirms effectiveness of the application of "the accelerated recovery program" as a technique allowing to achieve not only early physical, but psychological rehabilitation after the operations.

3. When analyzing the terms for restoration of the motor intestinal function, it was revealed to be in 1,5 times faster at the women from the index group who were treated according to "the accelerated recovery program" comparing to those from the experimental one. Restoration of the intestinal peristalsis and beginning of gas discharge was in about 16,8±2,4 hours at the women from the index group; but women from the experimental one had it averaging in 26,5±1,3 hours ( $p<0,05$ ). Renewal of the bowel functioning was in 1,5 times faster in the index group than in the experimental one.

4. Average length of staying in the hospital for the women from the index group was 5-6 days (about 5,8±1,2 days), and it was 6-8 days (about 7,1±1,1 days) for those from the experimental one ( $p<0,05$ ).

#### List of symbols and Abbreviations

ARP - the accelerated recovery program

EN - early enteral nutrition

EP - ectopic pregnancy

GH – general health

PF- physical functioning

SF – social functioning

VAS - Visual Analogue Scale

VT - vitality

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