

## PREVENTION OF COMPLICATIONS OF GESTATION AT PREGNANT WOMEN WITH THE ACUTE APPENDICITIS

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The article provides results of dynamic research of stress hormone prolactin and indexes of endogenous intoxication among 78 pregnant women who suffered surgery regarding appendicitis. We have established increase in prolactin level 1,5–1,8 times in 5–7 days after appendectomy ( $P < 0,05$ ) with further decrease in hormone concentration after days 10–14, and also development of endogenous intoxication syndrome that was attended by signs of clinical symptoms that can lead to termination of pregnancy. Progression of the revealed disturbances has a negative influence upon the flow of gestational process, thus it increases risk of pregnancy loss up to 42,5% (comparison group). Additional facilitation of discrete plasma exchange in complex of treatment measures on days 3 and 5 after the surgery (main group:  $n = 36$ ) provides for preservation of stable prolactin concentration among the pregnant during all periods after the surgery and allows us to decrease frequency of pregnancy loss up to 2 times.

**Keywords:** appendicitis, pregnancy, prolactin, indexes of endogenous intoxication

Miscarriage has been one of the most urgent problems of obstetrics and gynaecology during a lot of years. Nowadays a tendency towards growth in extragenital diseases, including surgical pathologies, is registered among pregnant women, and it affects the flow and result of gestational process [2, 5]. Acute appendicitis is the most widespread surgical disease of stomach cavity organs among the pregnant (from 0,05–0,12 to 5,2%), and it requires emergency operational treatment [7, 13]. Complications of diagnosing an urgent pathology during pregnancy provide for a growth in destructive forms of appendicitis, and it increases the share of gestation complications. Regardless of the great number of works, devoted to problems of diagnosing and types of surgical treatment of appendicitis among the pregnant, insufficient attention is paid to problems of preventing gestation complications after appendectomy [9, 11]. So far the well-known and generally-accepted method of terminating pregnancy after appendectomy, carried out during the 1st trimester, has been prescribing spasmolytics, vitamins, gestagens [1]. During pregnancy trimesters 2 and 3 tocolytics are usually used to terminate pregnancy. At the same time, according to the bibliographic data, frequency of miscarriage under non-complicated appendicitis equals 19,4–50%, and it increases up to 90% in case of peritonitis development [1, 10].

**Research objective:** optimize preventive measures on miscarriage after appendectomy at the foundation of studying pathogenetic features of gestation flow under acute appendicitis.

### Materials and methods of research

Complex inspection of 78 pregnant women who had been operated regarding acute appendicitis during gestation period 4–30 weeks, has been carried out. During postsurgical period all patients were treated via therapy, aimed to prolong pregnancy. Apart from general spasmolytic and vitamin therapy, the main group ( $n = 36$ ) has been treated with discreet plasma exchange on days 3

and 5 after appendectomy in order to prevent intoxication and correct hormonal disturbances. Considering period of pregnancy, anti-bacterial preparations of penicillin and cephalosporin group have been prescribed to prevent purulent-septic complications. Patients of comparison group ( $n = 42$ ) received standard volume of treatment-prevention measures after the surgery. Control group ( $n = 37$ ) was formed of the pregnant with physiological flow of gestation.

All women have been treated with a complex of laboratory examinations, echography of organs of small pelvis and stomach cavity. In order to estimate unspecific immunological reactivity of an organism, leukocytic index of intoxication (LII) was calculated according to modified formula of Y.Y. Kalf-Kalif (1941). Level of general endotoxin was defined in blood serum of patients via Perceptibility of the method – from 4 pg/ml LPS E. Coli or Sal. typhi. Specificity of method equaled 98,7–99,2%. Concentration of prolactin in blood serum of patients was defined via method of immunoferment analysis with facilitation of commercial set, produced by “Bio-Rad”. Accounting immunoferment hormone definition results was carried out via photometer “Uniplan” (“Picon”, Russian Federation). Statistic procession of the research results was carried out with application pack Statgraphics (Statistical Graphics System).

### Results of research and their discussion

Patients of all groups were comparable in age, pregnancy period, and also presence of genital and somatic pathology. Age of patients varied from 19 to 32 years, average age of the main group equaled  $24,5 \pm 4,7$  years and it was  $25,3 \pm 4,4$  within comparison group, and  $24,2 \pm 5,6$  for control group ( $p > 0,05$ ). Gestation period at the moment of receiving patients in the hospital was within the limits 4–12 weeks for the majority of patients (40,5–41,7%), and it corresponds to opinion of many authors on greater frequency of acute appendicitis development (up to 75%) during the first half of pregnancy [2, 12]. 34 women of the main group (94,4%) and 40 (95,2%) – of the comparison group anticipated their first delivery.

Regardless of vagueness and untypical nature of appendicitis clinical displays in com-

bination with pregnancy, accurate diagnostics and surgical treatment have been carried out on the first day of patients' presence in hospital. Analysis of morphological research results shown prevalence of destructive forms of appendicitis under pregnancy in both groups (82,1%): phlegmon of appendix has been revealed among 45 patients, phlegmon-ulcer form has been established among 4 patients, gangrenous – among 6 women, and gangre-

nous-perforated form – among 10 patients (Fig. 1). Catarrhal appendicitis has been registered only among 13 pregnant women. According to bibliographic sources, frequency of diagnostic mistakes in case of acute appendicitis among pregnant women remains within 11,9 to 44,0%, thus proving for non-profile hospitalization, late diagnostics, and delayed surgical treatment, and increasing frequency of destructive forms of appendicitis [2, 8].

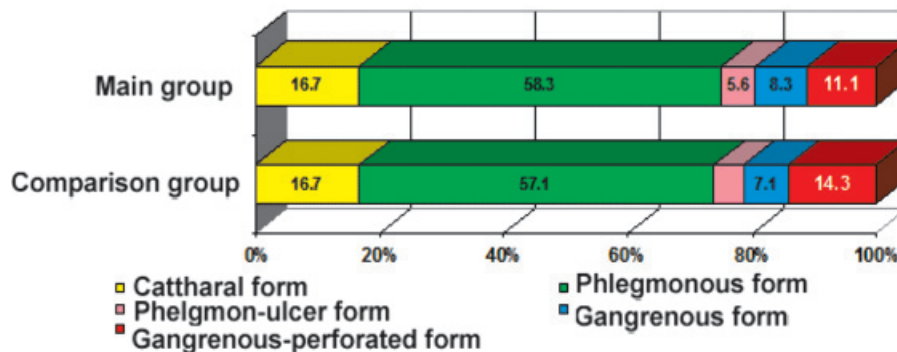


Fig. 1. Morphological features of appendicitis in groups of the studied women

Analysis of hemogram indexes and calculation of LII at the moment of receiving patients in the hospital has shown its reliable growth from  $0,9 \pm 0,42$  units in case of physiological flow of pregnancy, and up to  $2,62 \pm 0,34$  in case of appendicitis development ( $P < 0,01$ ). Further increase in LII up to  $3,05 \pm 0,61$  units has been

registered during postsurgical period on days 2–3. Definition of endotoxin serum concentration has revealed a significant increase in this index among women with appendicitis before and after surgery on days 2–3 in comparison to the control group ( $P < 0,01$ ), and it points to development of endotoxemia (Fig. 2).

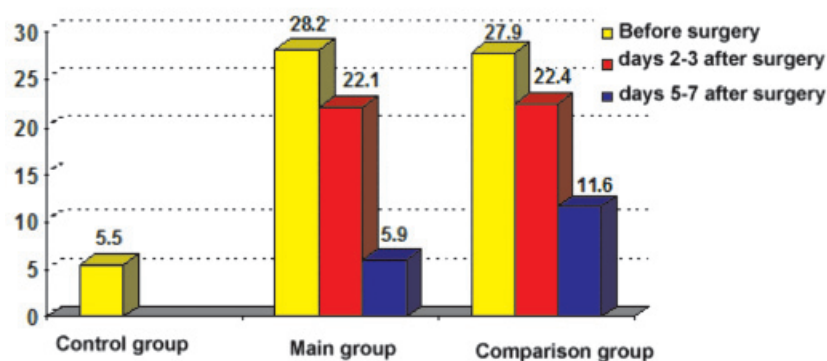


Fig. 2. Results and study of endotoxin in blood serum of the examined women

It is known that any inflammatory process is attended by development of endogenous intoxication syndrome. A work by O.S. Shubina and co-authors shows a negative influence of endotoxins upon the structure of

placenta tissue [6]. According to different authors, syndrome of endogenous intoxication is a starting point of thrombophilia pathogenesis, and progression of it causes disturbance of vessels' endothelium with disruption of its

thromboresistant characteristics that play a key part in regulation of hemostasis [3].

Dynamic examination of prolactin among the pregnant with acute appendicitis has shown increase in its serum concentration in comparison to the control group, moreover, more expressed increase in it (1,5–1,8 times) was registered on days 5–7 after appendectomy ( $P < 0,05$ ) (Table). In our opinion, a significant increase in prolactin is a protective reaction of a woman's organism against pain syndrome and stress, defined by development of the surgical disease and operation. On the other hand, high concentrations of prolactin in blood serum of the pregnant after appen-

dectomy have a blocking effect on flexing activity of alvus, regardless of surgery, and this phenomenon provides for progression of pregnancy during this period (up to days 7–10 of postsurgical period). Decrease in hormone concentration by 2 (Table) and emergence of myometrium hypertone according to US inspection has been registered on days 10–14 after appendectomy, at the same time, clinical indications of miscarriage risks (pulling pains in stomach area, bloody secretions from reproductive tracts) were expressed in the majority of cases (65,9%), it required further treatment of patients in conditions of obstetrical or gynaecological department.

Results of dynamic study of prolactin among pregnant women with appendicitis

Group of the examined women	Prolactin level (ng/ml) in dependence on pregnancy period			
	Weeks 4–12	Weeks 13–20	Weeks 21–25	Weeks 26–30
Control group ( $n = 37$ )	$n = 14$	$n = 9$	$n = 7$	$n = 7$
	$23,18 \pm 2,11$	$50,43 \pm 2,36$	$81,13 \pm 3,28$	$162,58 \pm 7,88$
Pregnant women with appendicitis (the day of receipt) ( $n = 78$ )	$n = 31$	$n = 19$	$n = 13$	$n = 15$
	$27,82 \pm 4,37$	$65,56 \pm 4,67$	$97,35 \pm 6,32$	$195,09 \pm 10,13$
Main group ( $n = 36$ ) (days 5–7 after appendectomy)	$n = 14$	$n = 9$	$n = 6$	$n = 7$
	$28,43 \pm 6,52^{**}$	$53,47 \pm 5,17^{**}$	$82,24 \pm 4,21^{**}$	$171,36 \pm 8,15^{**}$
Comparison group ( $n = 42$ ) (days 5–7 after appendectomy)	$n = 17$	$n = 10$	$n = 7$	$n = 8$
	$41,72 \pm 6,21^*$	$85,71 \pm 6,32^*$	$121,69 \pm 13,24^*$	$260,13 \pm 12,62^*$
Main group ( $n = 36$ ) (days 10–14 after appendectomy)	$n = 14$	$n = 9$	$n = 6$	$n = 7$
	$22,86 \pm 3,41$	$49,88 \pm 3,74$	$81,43 \pm 5,18$	$164,11 \pm 9,27$
Comparison group ( $n = 42$ ) (days 10–14 after appendectomy)	$n = 17$	$n = 10$	$n = 7$	$n = 8$
	$17,87 \pm 1,49^*$	$37,82 \pm 2,02^*$	$62,41 \pm 3,16^*$	$125,23 \pm 6,19^*$

Note: \*  $P < 0,05$ , difference in indexes from the control group;

\*\*  $P < 0,05$ , difference between indexes of the main group and comparison group.

Comparative analysis of studying laboratory indexes in dynamic indexes has shown that after facilitation of plasma exchange on pregnant women (main group) has shown that concentration of prolactin in blood serum on days 5–7 after appendectomy was reliably lower than hormone level among patients who had received standard treatment during postsurgical period (Table). Besides, we have not registered a sharp decrease in prolactin on days 10–14 after appendectomy in the main group. Serum concentration of the hormone among pregnant women of the main group didn't vary significantly during all periods of postsurgical period, at the same time, no reliable difference in prolactin level has been observed in comparison with this index of physiological flow of pregnancy during same periods of gestation [4]. The authors have established a relation between decrease in serum concentration of prolactin and initiation of flexing function of

alvus in case of factitious abortions or preterm deliveries.

We should also outline that additional introduction of discreet plasma exchange on days 3 and 5 after appendectomy provided for a more expressed decrease in endotoxin concentration in blood serum (Fig. 2).

Observation of pregnant women was carried out during the whole period of gestation. Analysis of flow and results of pregnancy after appendectomy has shown a greater frequency of gestational complications in case of standard treatment of postsurgical period (Fig. 3). Threat of miscarriage during the first month after surgery took place in all observations of the comparison group. After appendectomy and treatment in surgical department, 15 patients (35,7%) were transferred to obstetrical and gynaecological departments for the further therapy due to the remaining clinic of abortion threat or premature delivery.

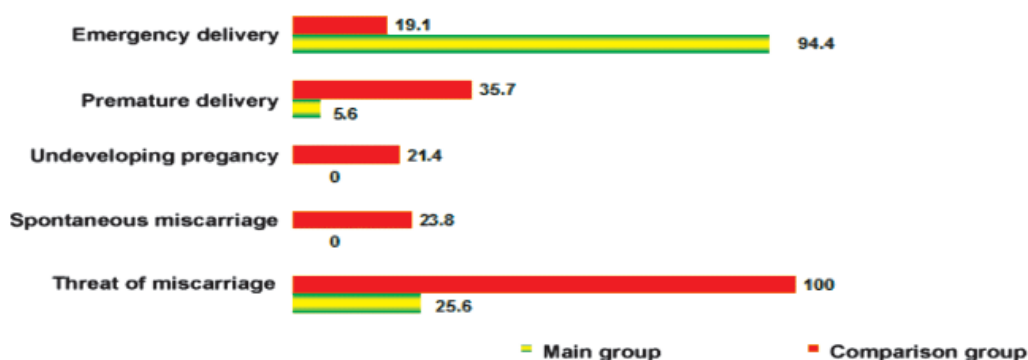


Fig. 3. Flow and result of pregnancy after appendectomy

The further observation of the pregnant allowed us to reveal the greatest share of miscarriage in the group of comparison in case of appendicitis development during gestation periods up to 12 weeks ( $n = 17$ ), frequency of factitious miscarriage equaled 41,2% ( $n = 7$ ), undeveloping pregnancy – 23,5% ( $n = 4$ ). In our opinion, instability of hormonal background during early periods of gestation (less than 12 weeks), sharp oscillations of prolactin, and also development of endotoxiosis during this gravid period have unfavorable impact upon the process of embryogenesis and pregnancy development, thus increasing frequency of reproductive losses.

Favorable result of pregnancy after appendectomy was stated only among 54,8% of women ( $n = 26$ ) in comparison group, and in 35,7% of cases pregnancy resulted in premature delivery at gestation period of 30–36 weeks. Implementation of plasma exchange after appendectomy among patients of the main group provided for prolonging pregnancy in all cases (Fig. 3). We shall point out that additional implementation of plasma exchange in complex of treating measures among the pregnant after appendectomy allowed us to decrease frequency of miscarriage threats by 4 and decrease total number of miscarriages by 2, thus increasing total number of favorable results.

### Resume

1. Development of endogenous intoxication syndrome has been registered in case of simultaneous acute appendicitis and pregnancy. Progression of the revealed disturbances among the pregnant during postsurgical period has an unfavorable influence upon the flow of gestational process, thus increasing risk of miscarriage.

2. Studying dynamics of prolactin among pregnant women with appendicitis has shown a significant increase in its serum concentration, especially on days 5–7 after surgery, this phenomenon can be evaluated as protective reaction of a women organism against pain syndrome

and stress. A sharp decrease in prolactin level on days 10–14 after appendectomy was attended by emergence of miscarriage threat symptoms.

3. Additional facilitation of discreet plasma exchange after appendicitis surgery provides for preservation of stable prolactin concentrations among the pregnant during all times of postsurgical period, and also decrease in indexes of endogenous intoxication, all of it allows us to consider this method efficient and safe to prevent miscarriages after appendectomy.

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