INTRODUCTION
The growing speed of social and economic development poses a number of specific challenges to the healthcare industry. One of them is early recovery of proper qualities of life indicators of a patient after operative intervention. That is why the outpatient medicine becomes more and more popular. [1] These days in hospital environment of one day not only consulting assistance is provided but also diagnostic and treatment operative interventions are performed. Due to low injury rate, the possibility of rapid recovery after operative intervention and the absence of necessity for women to leave current affairs, the gynecology of one day has gained widespread popularity [2; 3]. Among the number of outpatient gynecological operations, the leading place is curettage of the uterine cavity (CUC) as one of the most effective diagnostic techniques of outpatient gynecology [4].

Scientists pay attention to a significant place of pathology of endometrium [5] and neoplasms of the uterine cavity among the total number of pathologies of the organs of the female genital sphere [6]. Information from the Center for Medical Statistics of the Ministry of Health of Ukraine shows that in 2017, under the conditions of local medical and preventive treatment facilities, almost 140,000 such interventions were conducted that were not related to termination of pregnancy [7].

The anesthetic achievement for a period of its history accounts for many variants of anesthesia, each element of which appeared and worked out in accordance with the requirements of a surgeon and a female patient [8; 9]. Today, in the sphere of outpatient gynecology, anesthesia has reached the level where it can fully provide any anesthetic and surgical requirements during operational intervention. In everyday

THE INFLUENCE OF VARIOUS METHODS OF ANESTHESIA ON TIME OF POSTOPERATIVE RECOVERY OF PATIENTS’ CONSCIOUSNESS AFTER CURETTAGE OF UTERINE CAVITY

WPŁYW RÓŻNYCH METOD ZNIECZULENIA NA CZAS POWROTU ŚWIADOMOŚCI PO ZABIEGU U PACJENTEK PODDAWANYCH ŁYŻECZKOWANIU JAMY MACICY

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ABSTRACT
Introduction: Scientific information sources point to the significant effectiveness of curettage of uterine cavity (CUC) as a diagnostic and treatment mode of gynecologic oncology. Today the anesthesia service is able to satisfy virtually all the requirements of a surgeon and a female patient, however, some institutional factors, as for example postoperative recovery of consciousness, and factors influencing it, remain unaddressed.

The aim: to explore the possibilities of influence of different combinations and dosages of medical preparations used to provide monitored anesthesia care of CUC, to change the time of postoperative recovery of patient’s consciousness.

Materials and methods: an interview of 96 patients by VAS, studies of cortisol, insulin and glucose levels in blood serum, measurements of time from the end of surgery to the awakening and complete recovery of consciousness and statistical processing of the results have been conducted.

Results: A combination of 50 mg of dexketoprofen and half-dose drugs for narcosis can hasten the postoperative wake-up time by 38%, while maintaining dosages can prolong by 37% on the contrary. There is a dose-dependent effect of drugs for narcosis on the time of full post-operative recovery of consciousness. The reduction of their dosages by half can reduce this time by almost 40%.

Conclusions: the dosage modification of anesthetic drugs and their combinations may have a significant effect on the time of postoperative awaking and complete recovery of consciousness in female patients after CUC. As a result, it has a positive physiological, psychological and social effect.

KEY WORDS: outpatient gynecology, curettage of uterine cavity, time of postoperative recovery of the consciousness
practice, with the objective of ensuring proper monitored anesthesia care of various combinations of antihistaminic and pro-kinetic preparations are used for narcosis, narcotic and non-narcotic analgesics, local anesthetic agents, etc. However, the depressive effect on the consciousness of certain product groups prolongs postoperative recovery of patients. The question of the time limits of such recovery of women after outpatient gynecological operations remains without due attention: the influence of combinations and dosages of anesthetic medical preparations on the duration of postoperative depression of consciousness, the influence on the life quality of women in the early postoperative period after outpatient operational interventions has not been studied yet.

As indicated by publications of world scientists, the study of the impact on the life quality of a significant number of medical and socio-medical factors in various fields of medical science [10; 11]. Particularly, in the field of gynecological surgery, the issues of changing the life quality under the influence of pain [12], psycho-physiological peculiarities of gynecological diseases, the therapy of which includes the surgical stage [13], etc. are currently considered.

Concerning postoperative recovery of consciousness, there are publications in which authors give the data of their studies of changes in the cognitive-intellectual sphere in the early postoperative period [14], self-identification of a person [15], depending on dosages of preparations used during anesthesia. The work of scientists from New Mexico (Yen T et al.) appears to be interesting. In their works they stated the practical achievements, gained under investigation of external shock therapy in sedation. A research was performed on the speed of postoperative recovery of consciousness and self-identification in time and space using different induction preparations [16].

It is necessary to operationalize the difference between such concepts as “awareness” and “consciousness”. With the characteristics of the post-procedure and functional recoveries of CNS, depending on the need to perform one or another action relative to the patient, both concepts can be used. As for example Pasichnyk G.P. in his article uses the term “awareness” [17]. Analyzing it, we see that the data obtained during the BIS-monitoring and Aldrete scale characteristics were used to determine the moment of the possibility of restoring the physiology of the upper respiratory tract (tracheal extubation) and patient transfer to the postoperative department, in other words, the registration of the final autoregulation of the basic physiological characteristics of the organism. At this, the author points out that the termination of personal observation of the patient and transporting him to the postoperative department is already possible for the assessment on the Aldrete scale at least in 8 points (motion activity ≥1 and consciousness ≥1 point). The possibility of continuing, even not individual, but competent observation of the patient, separates the limits of the use of the terms “awareness” and “consciousness”. Under the conditions of outpatient operational medicine, leaving the patient without competent observance is possible only if the consciousness is restored, that is, not only the basic physiological functions, such as hemodynamics, vascular tone, spontaneous breathing, etc., but also the full adequate restoration of self-identification as a personality, of his body in space and time, awareness and opportunity to formulate the purpose of life, correct implementation of elementary instructions of medical personnel, critical thinking. Only upon these conditions, the patient can be safely transferred to the general ward, and to stay not under the care of a physician. In such a case the patient transfer to a general ward is possible only after getting of 10 maximum possible Aldrete scale. Thus, the anesthesiologist can be sure that in the conditions of adequate post-operative analgesia the manifestation of the possible presence of an accentuation of personality traits of patient will not threaten life and health of him or people around. This question is especially important when working with the category of oncological patients with gynecological disorders. The somatopsychic aspect of oncological diseases can have a significant pathogenic effect on the structure of the individual, to destroy the established positive dominant, endanger the mental integrity of the individual and his mental health in general. Such an influence is especially important when taking into account the patients’ life quality of gynecological hospital of one day. Staying of a patient under the care of a physician up to a total recovery of consciousness (not “awareness”!) is an important psychological factor with a sanology effect for both participants in the social relations of the “doctor-patient” system. The patient obtains calm and assurance in the necessity and urgency of providing medical care by a qualified medical worker in case of such need. The anesthesiologist, in his turn, has confidence in the impossibility of its occurrence after transfer to the general ward, the safety of leaving the patient without direct qualified supervision.

JUSTIFICATION OF STUDY
As is clear from the above mentioned, the period of postoperative recovery of consciousness has a significant influence on patients’ life. Although, the outpatient anesthesiology of gynecologic hospitals of one day has not been investigated by the time characteristics of postoperative recovery of consciousness of patients after minor endo-uterine operational inventions. Possibility of influence and this factor is an important tool when working with such a specific cohort as women with oncological diseases. Specification of influential mechanisms on time of postoperative recovery of consciousness should give anesthesiologists practical recommendations for improving the life quality of patients of gynecological hospital of one day.

THE AIM
The objective of our work is to study the possibilities of influence of various combinations and dosages of medical preparations, used for anesthesia service of CUC, to change the time of postoperative recovery of patient’s consciousness.
MATERIALS AND METHODS

During 2017 on the basis of SI “Grigoriev’s institute for medical radiology of National Academy of Medical Sciences of Ukraine”, 96 female patients of working age with diagnostic and treatment purposes were maintained the curettage of uterine cavity. Women were included in the study after obtaining informed consent. Eligibility criteria have become: age of patients from 21 to 55 years; need for diagnosis of tumors or surgical removal of polyps in the uterine cavity and / or cervical canal; anesthetic risk for ASA I-II. Exclusionary criteria in their turn have become: the need for urgent intervention; severe accompanying pathology to a large extent exceeding the degree of surgical-anesthetic risk; chronic diseases in the stage of exacerbation; liver disease in violation of its metabolic functions. The intervention was carried out in hospital environment of one day. All women left the clinic on the operation day.

All women were randomly divided into III groups, 32 patients in each. The anthropometric and age characteristics of the group did not have statistically significant differences (p>0,05) (Table I)

10 minutes prior to operational invention, all patients received intravenous preanesthetic medication, which consisted of atropine 0.01 mg / kg, diphenhydramine hydrochloride 0.15 mg / kg, and ondansetron 4 mg. The difference between the groups was the difference in medicamentous combinations and doses of anesthetic management. The group I is the observational group: anesthetic management consisted of a combination of propofol 2 mg / kg, fentanyl 2 mg / kg and ketamine 2 mg / kg;

In patients of the group II, the same combination was used for the anesthesia as for patients of the group I, but additionally, as a preanesthetic medication a preparation was inserted "on the table" from the group of non-steroidal anti-inflammatory agents (NSAIA), namely dexketoprofen at a dose of 50 mg. The medicamentous combination for the patients of group III was the same as of group II; however, the difference was the reduction of dosage for noninhalation narcosis (ketamine up to 1 mg / kg and fentanyl up to 1 mcg / kg).

At the appearance of signs of awakening, such as mimic and motor activity, impression of respiratory movements, an additional infusion of propofol at a dose of 0.03 mg / kg was performed every 2 following minutes. The average duration of operational intervention was 7.00 ± 0.308 min. in the group I and up to 7.84 ± 0.288 min. in the group III. There are no statistically significant differences in the duration of the operation between the groups.

The time marking to awakening and complete recovery of consciousness began with the end of the operational intervention. The starting time of the awakening (the time of awakening) was recorded at the occurrence of arbitrary movements, mimic emotions and eye-opening. Complete recovery of consciousness was recorded when the patient received 10 points on the Aldrete scale.

### Table I. Anthropometric and age characteristics (M ± m)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Group I (n=32)</th>
<th>Group II (n=32)</th>
<th>Group III (n=32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>41,6±1,45</td>
<td>41,8±1,58</td>
<td>44,8±1,15</td>
</tr>
<tr>
<td>Height</td>
<td>165,4±1,05</td>
<td>166,5±1,14</td>
<td>166,3±1,25</td>
</tr>
<tr>
<td>Body weight</td>
<td>71,8±2,43</td>
<td>66,9±2,04</td>
<td>68,8±2,41</td>
</tr>
<tr>
<td>Body weight index</td>
<td>26,3±0,95</td>
<td>24,2±0,80</td>
<td>24,3±1,19</td>
</tr>
</tbody>
</table>

**Fig. 1.** Time of recovery of patient’s consciousness after CUC in conditions of various kinds of anesthesia (M ±m); the differences are statistically significant between the indicators of all groups (p < 0,05).
In order to control the proper level of analgesia, patients were offered inquiry on a VAS scale.

For the purpose of objectification of the pain level, the following stress markers were chosen: serum levels of cortisol, insulin, glucose. The determination of serum of cortisol and insulin was performed by ELISA technique with the sets of reagents “SSS-EIA-Steroid-Cortisol” and “Insulin-EIA-BEST”, respectively. The serum glucose level was measured by calorimetric method using the “Liquick Cor-GLUCOSE” diagnostic kit. Cortisol-insulin index (C/I), which was calculated mathematically by the formula 1, was also studied.

Formula 1. Calculation formula C/I is developed by Panin L. E. [18]

During the study, the pain level was monitored three times: for the first time, the survey and monitoring of laboratory parameters were performed prior to operation in the patient’s presence in the ward (before she was transferred to the manipulation room in order to reduce the level of psycho-emotional stress, which theoretically could have an effect on the level of the laboratory parameters under study). The results of the first study were used in the following as control and are marked with the number “1”. The second checkpoint was the time of consciousness recovery and was designated as number “2”. For the third time the control of the pain level was carried out one hour after the second; marking - “3”.

Statistical processing of results was performed using the computer program for Windows the SPSS 19 (USA). The analysis of the studied parameters with regard to the normal
RESULTS
When investigating the timeframes of postoperative recovery of consciousness after curettage of uterine cavity, it was found that the average time of awakening in the observational group was 3.3 ± 0.4 min. When using dexketoprofen in combination with ketamine and fentanyl in full doses (group II), this time increased by 37% and amounted to 4.5 ± 0.4 min. The halving of ketamine and fentanyl (group III) led to a significant reduction in time of awakening (by 38%) compared to the observational group, that is, it reached only 2.1 ± 0.3 min. (Fig. 1)

The time for complete restoration of consciousness in the groups I and II was 11.4 ± 0.7 and 11.2 ± 0.5 minutes, respectively. Statistically significant differences between these groups were not detected (p > 0.05). For patients of the group III, this time was considerably less than that in other study groups and lasted just over 6.5 minutes, which was about 60% of the time when complete consciousness was recovered in groups I and II (Figure 2).

Results of monitoring survey of biochemical stress factors are represented in the table II. Keeping watch over the growth of stress level with the course of time. Differences are statistically significant between biochemical markers of stress during runtime, namely by comparison of groups I and II, I and III, and 2nd and 3rd monitoring points (p < 0.001).

Characteristics of survey findings by VAS is the following and is represented in the table III.

DISCUSSION
Before starting the discussion about time response characteristics of postoperative recovery of female patients of CUC, it is necessary to prove the analgesic effectiveness of all anesthetic techniques under investigation. Significant difference between C/I 2 indicators in all groups are explained by the effectiveness of dexketoprofen, as the preparation of intraoperative anesthesia of minor gynecological operational interventions. This can be seen in the table II, in which the direct indicators of C/I are described.

We see that C/I in the group I is higher than the same indicator in groups II and III. The same picture can be seen by the example of insulin indicators. The difference between levels of insulin 2 in groups I and II, as well as in groups I and III (table II) testifies to the expediency of using dexketoprofen as part of the intravenous anesthesia of CUC as an additional one.

The subjective measurement of the pain syndrome level, presented by the results of the VAS scale, shows that all three of the investigated methods of CUC anesthesia are effective. VAS 2 indicators, shown in table III in all groups is less than mark ”4”, which indicates a low level of early postsurgical pain syndrome that does not require additional anesthesia.

To the above mentioned data, it makes sense to remark on the indicators of VAS 2 and C/I 2, which in group III are greater than those of group II (table II and III). Their reliable statistical differences may indicate a decrease in the effectiveness of the analgesic component of anesthesia in group III. However, the numerical characteristic of the pain syndrome level for VAS in patients of group III is also less than 4 points, which proves the allowability of such a decrease.

In examining indicators C/I and VAS indicators, obtained an hour after the recovery of consciousness, we observe an increase in the intensity of pain syndrome without a clear regularity of correlations of indicators of stress factors, which is explained by the full completion of the analgesic effect of preparations for narcosis. The conclusion is drawn on the expediency of considering the pain relief that occurs during this time period as postoperative, and the search for specific types of analgesia is appropriate for the struggle against pain in patients after the CUC.

V.G. Bayda and co-author (2008) argue that there is an influence of a combination of anesthetic group preparations on the time of postoperative adaptation of patients of the one-day hospital [19]. However, their studies do not cover such a subtle aspect of this process as the time to recover consciousness after the end of operation. Such a time has been investigated in patients, who have undergone, although minimally invasive, but requiring complete hospitalization, operations [20].

In order to deepen knowledge on the time of postoperative recovery of consciousness in groups of ambulatory patients, the analysis of the data presented in fig. 1 has been carried out, which proves that the strengthening of the analgesic component of monitored
anesthesia care, together with the preservation of the total dosage of ketamine and fentanyl, prolongs the recovery time of the patients. Currently, additional anesthesia, along with the dose reduction of anesthetic preparations, is able to accelerate the recovery time almost by a factor of two, which may be explained by a decrease in pain perception. Although NSAIDs do not have a direct influence on the perception and treatment of pain impulse with the central nervous system, however, the inhibition of the formation of prostaglandins synthesized from arachidonic acid by inhibition of cyclooxygenase in the tissues of the uterus under curettage of the uterine cavity reduces the sensitivity of the nociceptive receptors of the cerebral cortex to histamine and bradykinin. On the other hand, the inhibition of perception is relatively enhancing the effect of the hypnotic component of anesthesia. A significant difference in the recovery time of patients in group III (by almost 50%) compared with groups I and II (p <0.05) indicates dose-dependent clinical efficacy in reduction of ketamine and fentanyl doses.

An authentic statistical difference between the temporal rates of awakening of patients of the groups I and II, which is shown in fig. 1 indicates the effectiveness of dexketoprofen as an additional analgesic preparation for minor gynecological operational interventions that can affect the time of postoperative recovery due to additional analgesic effect.

Regarding the time of complete recovery of consciousness (fig. 2), based on the lack of statistical significance between the groups I and II and its presence between groups I and II, as well as between II and III, we can assert that the possibility of influencing the investigated parameters by temporal pharmacodynamics dose-dependent effects of preparations for anesthesia without the effect of an additional analgesic component.

The obtained results indicate a significant effect of the combination of 50 mg of dexketoprofen and half-doses of ketamine and fentanyl at the time of postoperative recovery of consciousness of patients after CUC. Such a combination may be used by practicing anesthesiologists for the purpose of life quality improvement of patients, that must undergo CUC under the conditions of gynecological hospital of one day, the correspondence of monitored anesthesia care of the CUC to the principles of multimodal strategy of interventional case management “Fast Track Surgery” and outpatient medicine in general.

Scientists should pay attention on the fact, that in the study only injectable preparations of anesthetic drugs were used. A rightful place in the outpatient anesthetic unit is occupied by inhalation anesthetics, the use of which, as is known, also provides a rapid postoperative recovery of consciousness. However, due to the high cost of these preparations and the absence of an institution on the basis of which the research was carried out on material and technical equipment for their use, the influence of the use of inhalation anesthetics during CUC for the duration of the postoperative recovery of consciousness of patients in the gynecological hospital was not carried out. This fact opens the door to the further study of this issue.

**CONCLUSIONS**

As a part of the study of time-response characteristics of postoperative recovery of consciousness of working age patients, which under the conditions of one-day hospital were made CUC, it was found that:

1. The anesthesia of female patients, which underwent CUC in 1 hour after recovery of consciousness must be considered in post operational context, to which the influence of intraoperative analgesia is smoothened over;
2. A combination of 50 mg of dexketoprofen and preparations for narcosis in half-dose is able to speed up the time of postoperative awakening by 38% in comparison with classic medicamentous anesthetic combination, remaining the dosages – alternatively to increase by 37%;
3. There is a dose-dependent influence of preparations for narcosis for the time of total postoperative recovery of consciousness; their under dosing when combined with dexketoprofen at a dose of 50 mg is able to reduce this time almost by 40% and may be used by practicing anesthesiologists for the purpose of improvement of life quality of female patients, which were indicated the CUC under the conditions of gynecological hospital of one day, correspondence of monitored anesthesia care of CUC to the principals of multimodal strategy of interventional case management «Fast Track Surgery» and outpatient medicine in general.

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Authors’ contributions:
According to the order of the Authorship.

Conflict of interest:
The Authors declare no conflict of interest.

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Received: 10.11.2018
Accepted: 20.02.2019