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Professional article ■

Preoperative Preparation of Patients for Gynecologic Surgery

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SUMMARY

Surgical treatment of the patients with gynecologic diseases is warranted only when all the conservative treatment approaches have been exhausted. Surgical treatment is a stress for the patient, and associated risks and complications may be life-threatening. Surgery may be performed after the patient has been informed and her written consent obtained regarding the risks associated with surgery. In order to avoid the risks and complications of surgery, preoperative patient preparation constitutes an important step and is done according to a precise sequence of procedures and measures. The aim of the paper is to present a systematized sequence of procedures and measures to be taken before a planned gynecologic surgical treatment, and to demonstrate the significance of preoperative preparation of patients for the surgery itself and postoperative recovery. After the first visit and talk of a gynecologist with his patient, gynecologic and general clinical examinations, blood and urine laboratory, and various consultative specialist exams (for internal diseases, anesthesiology, etc), the decision is made if and how the surgery should be done. General and special surgical risks are estimated and the decision on the type of surgery is made. Two hours before surgery, a dose of prophylactic antibiotic therapy is administered, and thromboembolic disease is prevented with low doses of subcutaneous heparin. The operation field is treated with disinfectants immediately before surgery, with mandatory placement of the Foley catheter in the bladder.

Key words: gynecologic surgery, preoperative preparation, risk factors

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INTRODUCTION

Preoperative care involves a number of various measures and procedures conducted before surgery. Prior to any surgical treatment, all conservative methods of therapy must be exhausted to determine if the patient can safely sustain the risk of the surgery planned (1). During preoperative care, the gynecologic surgeon is fully acquainted with the patient's physical condition, and all the relevant data obtained during the interview with the patient must be inserted into the history of disease. After admission into hospital, the general clinical, gynecological and various additional specialist examinations are undertaken, supplemented by the information relevant for surgical treatment planning. The surgeon who is to undertake surgery is obliged to introduce to the patient all the reasons of the surgical treatment. The patient must be fully acquainted with procedures and risks of the surgery planned and must not be persuaded to undergo surgery against her own will. The patient must submit an informed written consent to confirm that she takes the risk of the planned surgical treatment (2). There are two groups of indications for gynecological surgery: absolute - when surgery must be undertaken, when its cancellation is life-threatening, and relative - when surgery can be postponed till the most appropriate occasion for its performing. Before making a decision on surgery, one of the three requirements must be fulfilled: relief of pain and suffering, preservation of life, correction of an existing deformity. If none of the three goals can be achieved by surgery, the surgery should be given up (3).

PREOPERATIVE EXAMINATION

Preoperative examination should help a gynecologic surgeon to prepare his patients for operation. In most cases it involves a physical exam, various tests, risk stratification and modification of risk factors. The surgeon can thus reduce any delays in the preparation phase, to improve patient's safety, to recognize and treat complex medical problems, and to reduce costs and surgery cancellations. A detailed medical history consists of the following elements:

Patient history

Any assessment of patient's ability to sustain the risks of the planned surgical treatment begins with the initial talk with the patient, i.e. recording of history data (anamnesis, i.e. recollection). If the patient cannot talk to the surgeon (comatous, affected by some mental disorder, children), the talking is done with the accompanying person (heteroanamnesis), recording the person's name. A detailed medical history and examination are the preconditions for any preoperative assessment, and the information obtained can determine perioperative

risk. The patients undergoing minor surgery can be examined by their surgeon and anesthesiologist on the operation day during preoperative preparation. However, those with more serious conditions should be examined at least a week before surgery, allowing the time for risk assessment, specialist consultations, and preparation, since many medical conditions can change within a few weeks, days, or hours after preoperative investigations. These more complicated cases require additional work-up or treatments before the surgery in question (4).

General medical history

General medical history contains the data on personal and family diseases, history of drug use, allergies to drugs, foods, and other environmental allergens, hospitalizations, earlier diseases (including previous operations and tolerance of anesthetics). A gynecologic surgeon learns about the patient's cardiovascular diseases (congenital anomalies, blood pressure, arrhythmias), respiratory system (chronic obstructive pulmonary disease), endocrine and gastrointestinal diseases, neurologic status (cerebrovascular, peripheral, or central neurologic processes), hematologic condition (anemias, coagulation disorders), health habits (smoking, intake of alcohol, drugs, diets, physical exercise), and socioeconomic status (marital status, occupation, education). Important family data refer to malignancies, cardiovascular diseases, diabetes mellitus, cerebrovascular diseases, and osteoporosis (5).

Gynecologic and obstetric history

Each gynecologic anamnesis should contain the data about major complaints of the current disease (beginning, duration, symptoms), menstrual cycle data (intervals, duration, copiousness, dysmenorrhea, premenstrual syndrome, intermenstrual bleeding); menarche; data on the last menstruation; if the patient is postmenopausal, age at menopause, recent vaginal bleeding, vasomotor symptoms, hormone replacement therapy; past pregnancies (description of each, duration, complications, type of delivery); birth control (if sexually active - active contraception, methods in the past; if sterilized - time and mode of sterilization); sexual history (sexual partners - homosexual, heterosexual, bisexual; orgasms; dyspareunia; problems; complaints; questions); birth control (conception difficulties, infertility treatment, vaginal infections, Papanicolaou test (the last, abnormalities), infections (vaginal discharge, previous vaginal infections, sexually transmitted diseases, small pelvis inflammations), vaginal prolapse with urinary problems (retention, incontinence); breast diseases (discharge, pain, past problems, family history of breast cancer, surgery).

A comprehensive history, as described, is the first step helping surgeons to determine the scope of

general physical examination, laboratory, and radiologic tests (6).

Clinical (physical) examination

The aim of the physical examination is to establish the physical, health status, in view of history and medical condition. An adequate examination consists of the parameters such as: vital signs (blood pressure, puls, breathing, body temperature), habitus and physical appearance (head, ears, eyes, nose, bone system, extremities), airways and lung auscultation, heart auscultation with rhythm determination; neurologic condition with mental status observation, function of the cranial nerves, and sensorimotor abilities; detailed exam of the abdomen and pelvis, as the main component of the procedure. The physical examination should serve us to

establish if the disease process is stable and are there any improvements or exacerbations. A surgeon should discuss with the patient about the extent of surgery, planned incision, variations in the technique or extent, depending on the intraoperative findings. The discussion and detailed examination serves also to encourage both the patient and his doctor. A history and physical examination serve to get the answers to some questions (7). Table 1 presents some specific questions to be answered before the operation. As already stated, adequate history and physical examination require some routine preoperative laboratory tests and additional specialist examinations in order to establish objective patient status and perform assessment of the tolerability of operation (Table 1).

Table 1. Specific questions which should be answered before operation

Questions

1. Are extra questions needed and which ones? If yes, which?
2. Does the present disease imitate any nonsurgical disease?
3. Is it now the right time for operation or will its delay increase chances for success?
4. Is there a possibility for applying some therapeutic procedures that will increase chances for success of the operation?
5. Will the patient be able to provide autogenic blood transfusion is postponed?
6. Is the patient at too many risk factors endangering the success of the operation?.
7. Is the patient mentally and physically ready to endure operation?

Preoperative indications for laboratory tests

Patient age, diagnosis of the disease, risk of the procedure with careful and detailed history and physical examination establish the need for specific preoperative testing. Laboratory analyses of the blood involves blood group determination, complete blood count with the leukocyte formula, sedimentation, bleeding and coagulation time, thrombocytes, fibrinogen. Renal function is checked (diseases, urea, creatinin, diuretic therapy, serious or prolonged hypertension) and liver function as well (suspect liver diseases, suspect or proven cirrhosis, potential hepatitis, anticoagulant treatment, bleeding disorder symptoms, abnormal PT and aPTT, bilirubin, serum alanine-aminotransferase, serum aspartate aminotransferase) (8). Glucose in the blood is determined as well (history of diabetes, hypoglycemia, adrenal glands, current corticosteroid treatment). General analysis of the urine and urinoculture is performed. If required, other analyses are done: electrolytes (sodium, calcium, chlor,

calcium), cholesterol, triglycerides, tests for inflammatory processes (9). Previous ECGs are useful to the surgeon only if it can reveal the abnormalities undetected with other approaches (10). After admission and history taking (history, physical examination), the female patient gives her informed written consent about the suggested diagnostic-therapeutic procedures.

Complete gynecologic examination

A complete gynecologic examination is done preoperatively, involving the control of cytologic Papanicolaou smear of the uterine cervix, vaginal discharge testing, colposcopy of the mucosa of the lower portion of the vaginal tract (vulva, vagina, uterine cervix), bimanual palpatory and endovaginal sonographic examination of the uterus, ovaries, and Fallopian tubes. If there are signs of cervical inflammation (cervicitis) or vaginal mucosa (colpitis), it is necessary to take additional swabs for microbiologic analysis (bacteria, chlamydia, urea-

mycoplasmas, human papillomavirus, and herpes simplex virus) (11).

If the patient is admitted for the treatment of prolapsed genital organs, special attention is paid to bimanual and rectovaginal examination to establish the type, degree, and site of the disorder (prolapse of the uterus, vaginal walls, Douglas pouch, etc.). If there is involuntary urination that cannot be controlled, complete urodynamic examination should be performed, or at least the tests to objectify incontinence, since any instability of the bladder detrusor muscle in the form of proven urgent incontinence, requires conservative, medicamentous treatment or electrotherapy before the operation. Stress incontinence associated with other genital diseases requires surgical treatment combined with other planned surgery whenever required or technically feasible (12).

Before the planned operation, we must not miss the pregnancy or malignant diseases. If pregnancy is suspected, the values of beta subunit of human chorionic gonadotropin from the blood (beta hCG) should be tested. If before surgery, after various diagnostic procedures, a pathologist has diagnosed or suspected of a malignancy of female genital organs, it is necessary to employ additional diagnostic procedures in order to assess the spread to adjacent tissues and organs. A sonographic examination of the upper abdomen and small pelvis imaging (computerized tomography, electromagnetic resonance) are warranted. As required, endoscopic examination of the bladder mucosa (cystoscopy) and large bowel (rectosigmoidoscopy, colonoscopy, irigography, etc) are done as well (13).

A planned radical operation requires that pre- or intraoperatively all ureteral visualization proceedings should be done (for the purpose of avoiding their injury), since with tumors or inflammations in the small pelvis they are commonly dislocated (14). In uterine cervix carcinoma, a rectovaginal examination is mandatory in order to assess clinically the involvement of the connective tissue in the small pelvis bottom (parametria). If ovarian cancer is suspected, blood tumor markers are measured preoperatively (CA 125, CA 19-9, HE4, AFP, etc). Histopathology of the removed tumor is done intraoperatively (ex tempore histopathology), and when tumorous changes are encountered in the left ovary, special attention should be paid preoperatively to large bowel since ovarian cancers are prone to spread to the sigmoid part of the colon (15).

OTHER PREOPERATIVE EXAMINATIONS

Preoperative consultations and other additional examinations

By the help of medical consultations and additional examinations the objective status of the patient is established, assessing the tolerability of the planned

surgery. At best, medical consultants involved in preoperative evaluation, should be those involved in continued postoperative care. Consultants should review the risks by the organ systems: cardiovascular, respiratory, endocrine (hyperthyreosis, thyroid storm, hypothyreosis), gastrointestinal, urinary, hematopoietic. Psychologic considerations are of special importance, since any surgery of the female genitals stimulate various emotions associated with the status of womanhood. In addition to the concerns related to their disease, women are also worried about their rehabilitation, conspicuous changes, possible sexual dysfunctions, and return to the general well-being. A surgeon must address these questions in a rational and affirmative way (16).

A female patient should be able talk to her surgeon in an open, frank way, and the surgeon should help her to better understand the suggested procedure. Consultations should answer the following questions: What is the diagnosis? What way it was established? Are more precise, additional tests required? Is the patient optimistic about the outcome? Are there steps to be taken to improve her condition? Are additional information about the risk assessment available? Are there any suggestions about the course of the surgery and postoperative follow-up? (17).

Anesthesiologic preoperative examination

An anesthesiologist has to examine the patient before her operation. The examination helps him to get an insight into the general health condition, and to assess whether the patient is able to tolerate the risks and duration of anesthesia for the planned surgery (using internal examination, ECG, lung x-ray, lab test results). That is the moment when the type and route of anesthesia, available anesthetics, possible postoperative pain management, are discussed. A special stress is put on the state of consciousness and vital functions of the heart, blood vessels, liver, and kidneys. Chronic diseases of these organs are significant in that regard, as well as the current disease status, because of possible acutizations/remissions. Anesthesiologist orders additional tests if required, and any pathology in the upper airways is significant (nose, mouth, larynx, pharynx), as well as thyroid diseases, since these may disturb endotracheal intubation (18).

Anesthesiologic surgical risk is assessed based on the assessment of physical status created by the American Society of Anesthesiology - ASA), classifying them into 6 categories defining the risk of death:

I group - original disease, if it is without a systemic impact;

II group - moderate systemic disease without functional impediments;

III group - severe systemic disease with serious functional impediments;

IV group - severe systemic life-threatening disease;

V group - moribund patient, with life expectancy below 24 hours; and

VI group - confirmed brain death (19).

Principles of preoperative use of antibiotics

Wound infection occurs as the consequence of complex interactions between the bacteria reaching the wound intraoperatively, and local and systemic immunity of the host. The amount of inoculated bacteria is directly associated with the risk of postoperative infections. The factors such as prolonged postoperative hospitalization and overuse of antibiotics increase the risk of wound colonization. Provision of optimal local immunity to infection is primarily a surgical task. Various factors, such as the presence of blood, foreign bodies, ischemia, or necrotic tissue in the surgical field, can have an adverse impact on local patient defense and increase the risk of infection. By way of meticulous surgical technique we can avoid many of these factors. A principal benefit related to preoperative use of antibiotics is the elimination or prevention of growth of endogenous bacterial flora, which can induce infection in the surgical field (20).

The most important principle is that the chosen antibiotic should be effective against the pathogens most commonly responsible for infection after certain

operations. Adequate antibiotic concentration has to be present in the tissues in the beginning and during the surgery. A single dose of antibiotic immediately before the operation is sufficient for most surgical procedures. A maximum concentration of antibiotic in the pelvic tissues is reached 20 minutes after an i.v. administration, and after two hours it markedly drops. In time - consuming interventions intramuscular administration of antibiotics is preferred. If the operation is going to take more than 3 hours, administration of antibiotics should be repeated. Intravenous use of antibiotics is an optimal way to provide an adequate level of presence in the tissues for most gynecologic operations (21).

Prophylactic use of antibiotics have been demonstrated to be more successful for vaginal compared to abdominal operations. A recommended regimen for patients undergoing vaginal hysterectomy, abdominal or radical hysterectomy consists of a dose of i.v. cefazolin (1 g) or cefotetan (1 g) at the induction of anesthesia, or aminoglycosides with metronidazole (22). Table 2 lists the recommendations for prophylactic administration of antibiotics before gynecologic surgery, and Table 3 presents the risk factors for postoperative infections. Adequate use of antibiotics is able to reduce the rate of infections, as well as morbidity and associated costs (23) (Tables 2 and 3).

Table 2. Recommendation for choosing antibiotics in postoperative infection prophylax

Choice of antibiotics and doses

- | |
|---|
| 1. Cephalosporins first generation: up to 2,0 grammes |
| 2. Metronidazole 0,5 - 1,0 grammes + gentamicin 1,5 mg/kg iv. |
| 3. Clindamycin 600 - 900 mg iv + Gentamicin 1,5 mg/kg |
| 4. Ciprofloxacin 400 mg iv |

Table 3. Risk factors of developing postoperative infection in gynecologic surgery

Risk factors

- | |
|---|
| 1. Age of patient (senium) |
| 2. Body mass (extremely obese - thin) |
| 3. Presence of regional infection |
| 4. Chronic disease (malignant disease, diabetes, hypertension, liver, lang disease etc) |
| 5. Duration of operation (risk of infection doubles after 60 min. following the first hour) |
| 6. Previous long lasting antibiotic apply |
| 7. Patient's weak immune system |
| 8. Problems with intestinal tract (ileus, previous operations, radiations etc) |
| 9. Contamination with endogenic flora by a surgeon and other staff |
| 10. Bad surgical techique(stitching bigger tissue parts than necessary, tissue maceration etc) |
| 11. Unacarefull hemostasis |
| 12. Noise and conversation in the operating theatre, air-borne contmination |

Prevention of thromboembolic disease

Deep venous thrombosis (DVT) and venous thromboembolic (VTE) disease of the lungs are significant and statistically confirmed complications of surgical treatment. The rate of postoperative VTE ranges from 15% to 40% in women undergoing major gynecologic surgery without thromboprophylaxis. About 40% of all deaths after gynecologic surgery are directly associated with pulmonary thrombosis. Over 90% of pulmonary embolisms originates from the venous system distal to the vena cava, i.e. from the pelvis and lower extremities. A German pathologist Virchow described first as early as 1858 the causative factors of venous thrombosis: hypercoagulability of the blood, venous stasis, and trauma of the intima of blood vessels (24).

Important factors in the occurrence of postoperative venous thrombosis in gynecologic surgery are age (years) and extent of the surgery. Additional risk factors for DVT and pulmonary VTE disease are trauma associated with prolonged surgery (interventions lasting over 300 minutes and loss of over 600 ml of blood), earlier DVT, varicose veins, infection, malignancy (cancer treatment), estrogen treatment, earlier pelvic radiation therapy, smoking, insufficiency of the heart or respiratory system, obesity, immobility. Most authors agree that the combination of intraoperative venous stasis and hypercoagulability of the blood have the most prominent role in the occurrence of venous thrombosis. A thromb most commonly occurs in the period of 24 hours after surgery.

Prevention of VTE disease in gynecologic surgery is performed in three ways: by subcutaneous admini-

stration of low-dose preparations, infusion administration of dextran, and by various mechanical methods and procedures (25). Low-dose heparin preparations are administered subcutaneously and initiated 2 hours before surgery, continuing for 7 postoperative days in 8-12 hour intervals. Infusion administration of dextran from 70-40.000: administration of 500-1000 ml of dextran 70 as an infusion in 3 fractions: 500 ml intraoperatively, 500 ml immediately after operation, and 500 ml on the first postoperative day. In patients with disturbed cardiac and renal function, the use of dextran can result in excessive fluid retention and anaphylactic reaction (26).

Mechanical methods are very important as well, involving the reduction of stasis of the blood with a short preoperative hospitalization, and early postoperative mobilization. Feet elevation while in bed above the heart level supports venous drainage and reduces stasis. However, the most important methods from this group are external pneumatic compression and elastic stockings. The use of elastic stockings is the most significant method (after heparin) of prevention of thromboembolic disease in the medium and high risk patient group (27). Preoperatively, the patients should be classified in accordance with the levels of risk of thrombosis (given above) in order to establish the advantages and risks of pharmacologic and physical methods of prevention of thromboembolism. Related to the prevention of thromboembolic disease, all patients can be classified in four risk groups (Table 4).

Table 4. Risk groups according to thromboembolic disease prevention

Risk groups in thromboembolic prevention

1. Low risk

- do not have risk factors, younger than 40 years of age and surgery lasting less than 30 minutes

2. Moderate risk

- surgery lasting less than 30 minutes in patient with additional risk factors
- surgery lasting less than 30 minutes in patients aged 40-60 years with no additional risk factors
- major surgery in patients younger than 40 years with no additional risk factors

3. Higs risk

- major surgery in patients older than 40 years or with additional risk factors
- surgery lasting less than 30 minutes in patients older than 60 years or with additional risk factors

4. Higest risk

- major surgery in patient older than 60 years plus deep vein trombosis, cancer or hypercoagulable state
- pelvic exentration
- radical vulvectomy with inguinofemoral lymphadenectomy
- mayor surgery + deep vein thrombosis history and lung thrombosis
- mayor surgery + expressed postthrombotic arrest changes on low extremities

Immediate preparation of patients for gynecologic surgery

In addition to disease history, a patient list should contain all the agents and procedures performed during preoperative patient preparation. It is necessary to use a drug for bowel emptying 24 hours before surgery, and if required a deep enema in the evening before or morning on the day of operation. In the evening before surgery a nurse should remove all pubic hair from the patient's external genitals, performs vaginal toilette and applies an antiseptic vaginal tablet, and the patient may take a shower and clean her anterior abdominal wall if abdominal surgery is planned. Immediately before going to bed, the patient must take a dose of sedative (Bensedin 5 mg tablet, or something else). On the day of operation, two hours before operation, a planned dose of heparin is administered, and prophylactic administration of antibiotics and bandaging of the lower extremities with an elastic bandage or compressive stockings is done 30 minutes before surgery. After a short talk with the gynecologic surgeon, the patient is transported to the operation room. Before the induction of anesthesia, disinfection of the vagina and anterior abdominal wall is performed, and a Foley catheter is placed into the bladder. The operation field is delineated with sterile surgical clothes and the operation may commence (28).

CONCLUSION

Preoperative patient preparation for gynecologic surgery is to avoid or minimize both intra- and postope-

orative complications, enabling a successful outcome of surgery. Preoperatively, the diagnosis of a disease requiring surgery has to be made, with the assessment of safety and tolerability of the planned intervention. This can be accomplished by a well taken history, gynecologic examination, laboratory tests of the blood and urine, internal and anesthesiologic assessment (involving an ECG, chest x-ray, and additional specialist examinations). Based on the criteria of the American Society of Anesthesiologists, all patients are divided into six groups of risk of death during gynecologic surgery, based on the assessment of physical status. A precise diagnosis has to be made preoperatively in order to minimize intraoperative surprises. The decision to operate is made if at least one of the following reasons is present: relief of pain and suffering, preservation of life, correction of an existing deformity. If none of the reasons is present, the operation should be waived. Preoperative prophylactic use of antibiotics aims at elimination and prevention of growth of endogenous bacterial flora which could cause an infection in the surgical field. The measures taken to prevent thromboembolic disease are of special importance, since 40% of all deaths after gynecologic surgery are caused by this event. After preoperative preparation for gynecologic surgery, and in order for surgery to be successful, a gynecologic surgeon should answer the following questions: should I operate, may I operate, and do I know how to operate?

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PREOPERATIVNA PRIPREMA BOLESNICA ZA GINEKOLOŠKE OPERACIJE

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Sažetak

Za operativno lečenje bolesnice obolele od ginekološke bolesti odlučujemo se nakon što su iscrpljene sve mogućnosti konzervativnog lečenja. Operativno lečenje predstavlja stres za bolesnicu, a rizici i komplikacije koje ono nosi mogu ugroziti i njen život. Zbog toga se operativno lečenje može sprovesti nakon obavljenog razgovora sa bolesnicom i dobijanja njene pismene saglasnosti o prihvatanju rizika operativnog lečenja. Da bi se izbegli rizici i komplikacije kod operativnog lečenja, preoperativna priprema bolesnice čini važan korak u sprovođenju operativnog lečenja i sprovodi se prema tačno utvrđenom redosledu postupaka i mera koje treba sprovesti pre planiranog operativnog lečenja.

Cilj rada bio je prikaz sistematizovanog redosleda postupaka i mera koje treba sprovesti uoči planiranog operativnog lečenja u oblasti ginekologije, kao i ukazati na značaj preoperativne pripreme bolesnica za sam operativni tok i postoperativni oporavak posle ginekološke operacije. Nakon prvog susreta i razgovora ginekologa sa bolesnicom, ginekološkog i opšteg kliničkog pregleda, kontrole laboratorijskih analiza iz krvi i mokraće, i različitih konsultativnih specijalističkih pregleda (internističkog, anesteziološkog i drugih) donosi se odluka da li se i na koji način može sprovesti operativno lečenje. Procenjuju se opšti i

posebni rizici operativnog lečenja i donosi odluka o izboru operacije. Dva sata pre operacije ordinira se profilaktička doza antibiotika, načini prevencija tromboembolijske bolesti niskim dozama subkutano ordiniranog heparina. Operativno polje se tretira dezinficijensima neposredno pred operaciju i obavezno se plasira Foly kateter u mokraćnu bešiku.

Ključne reči: ginekološke operacije, preoperativna priprema, faktori rizika