

Rational selection of antibacterial drugs and postoperative nursing for gynecologic and obstetric surgery patients

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Abstract: Infection after gynecologic surgery is very common and frequent. If the control is not good, it will lead to serious consequences. Therefore, it is necessary to use antibiotics in the period of obstetrics and gynecology. This study will explore the use of antimicrobial agents in gynecologic and obstetric surgery, thus standardizing the use of antibiotics in the process of obstetrics and gynecology. Through the analysis of the use of antibacterials, we can see that the highest utilization rate of 5 kinds of antibacterial drugs followed by Cefaclor Sustained Release Tablets (65.7%), metronidazole (32.5%), cefthiamidine (26.8%), enoxacin (22.5%) and cefoperazone tazobactam sodium (11.8%). At the same time, the hospital should improve the consciousness of rational drug use and strengthen the administration of antibacterials in the operative period of obstetrics and gynecology. The application of antibiotics in the operative period of the department of obstetrics and gynecology can improve the current situation of its irrational use. Nursing work must take strict aseptic operation to prevent cross infection. At the same time, we should strengthen the observation of the effect of medication, monitor the body temperature and blood pressure, and identify the side effects of drugs.

Keywords: Antibacterials, combined use of drugs, cephalosporins, gynecologic and obstetric surgery.

INTRODUCTION

Infection after surgery in obstetrics and gynecology is very common and frequently occurring (Attari, 2016). If it is not well controlled, it can lead to serious consequences. Therefore, it is necessary to use antibiotics during gynecology and obstetrics operation (Bozkurt *et al.*, 2015). However, drug abuse is more common in obstetrics and gynecology perioperative medication, in variety selection, delivery time and maintenance time etc. there are great arbitrariness, deal with the above aspects of the specification, to the most effective infection control operation, to get the best curative effect, ensure the rational use of antimicrobial drugs (Caziuc *et al.*, 2015). Antibacterial agents refer to the types of drugs that have bactericidal or bacteriostatic activity, including antibiotics, sulfonamides, imidazoles, nitroimidazoles, quinolones and synthetic drugs (Kang *et al.*, 2003; Li *et al.*, 2015). Most antibiotics is composed of bacteria, actinomycetes and fungi after culture, part of the antimicrobial drugs is the use of chemical semi synthesis or chemical synthesis and direct manufacturing (Leng *et al.* 2004). Antimicrobial agents are widely applied in various surgical types. This study will explore the use of antibiotics in gynecologic and obstetric surgery patients, so as to standardize the use process of antibiotics in our gynecology and obstetrics department.

At present, preventive use of antibiotics in the operative period of Obstetrics and gynecology is very common to

reduce postoperative infection (Liu *et al.*, 2017). The incidence of postoperative infection is closely related to the degree of cleanliness of the operation itself, and not all the period of obstetrics and gynecology should be given antiseptic drugs (Manzat *et al.*, 2015; Webster *et al.*, 2017). This will increase the possibility of producing drug resistant strains in the hospital and also aggravate the medical burden of the patients (Vincent *et al.*2011). Therefore, the indications for the application of antibiotics in the operative period of the obstetrics and gynecology department should be strictly mastered. In the following cases, prophylactic use of antibacterials during the perioperative period: (1) Cesarean section, especially the rupture of the membrane more than 18h, repeated vaginal examination of more than 9h of the operation; (2) Transabdominal or transvaginal hysterectomy; (3) The operation range is large and the operation time is long. After the operation, all kinds of catheters should be retained for a long time, such as the operation of gynecologic malignant tumor. (4) Gynecologic plastic surgery; (5) Surgery with significant pollution or potential infection in the visual field of the operation.

The antibiotics used in the obstetrics and gynecology department during perioperative period should have strong bactericidal power, wide antimicrobial spectrum, high tissue penetration, long effective time, small adverse reactions and appropriate price / benefit ratio. At the same time, the application of antibiotics in the operative period of obstetrics and gynecology is a preventive application

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(Ostojic *et al.*, 2015; Zhao *et al.*, 2016). Aminoglycoside ototoxicity and neurotoxicity, tetracycline with liver toxicity, Zibo is not suitable as a preventive medication. Therefore, cephalosporins, penicillins and nitroimidazole are the most ideal choice (Tural *et al.*, 2015). Among them, cephalosporins have been widely used at home and abroad because of their advantages of wide antimicrobial spectrum, small toxicity, high efficiency and good tolerance. Research shows that: there is no significant difference in the incidence and infection rate between the different generation of cephalosporins in reducing the incidence of gynecology and obstetrics. Considering the economic factors (Wollheim, 2000), it is recommended that the first generation cefazolin is the first choice. Attention should be paid to the use of nitroimidazole antibiotics. Extensive use of such drugs will lead to the increase of resistant enterococci, and increase the difficulty of cure of infection, so it is not suitable for long time use (Xiao *et al.*, 2015).

MATERIALS AND METHODS

General information

A total of 160 discharged patients in gynecology and obstetrics department of our hospital in 2016 months were selected as the subjects. The youngest age group was 21 years old, with a maximum age of 46 years, with an average age of (28.3±5.6) years. Among them, 102 cases of gynecologic and 48 obstetrical cases. There were 38 cases of total hysterectomy, 29 cases of myomectomy, 18 cases of vaginal hysterectomy, 17 cases of radical ovarian cancer and 48 caesarean section. All patients were type II incisions. All patients were approved by ethics committee of the affiliated Yantai Yuhuangding hospital of medical college, ethics committee number as 2015 AYHMCSX and signed on the informed consent.

Investigation method

We collected age, operation name and use of antibacterial agents in patients' medical records, including usage, dosage, postoperative medication time, combined medication and wound healing. Using the questionnaire designed by our hospital, questionnaire survey was completed through medical record collection, statistical analysis and follow-up investigation. The contents are as follows: (1) The patient's age, medical record, hospitalization time, discharge time, diagnostic data and allergy history; (2) The type of operation, duration, healing of incision, and postoperative complications of the patients; (3) The type, name, usage, dosage, time and drug use of the antibiotics used in the perioperative period of the patients.

After completing the analysis and completion of the above data, this study will refer to the guidelines for clinical application of antimicrobial agents to determine whether the use of antibiotics in gynecologic surgery is in line with specific criteria. As: (1) Whether a patient's

indication has an indication of the application of antiseptic drugs; (2) Whether the selection of the antimicrobial agents and the formulation of the drug use plan are reasonable and correct.

Postoperative nursing

(1) According to the half-life of drugs, we should make full use of antibiotics in order to maximize the efficacy of drugs. (2) Strict aseptic operation, pay attention to hand hygiene, prevent cross infection in hospital. (3) We should evaluate abdominal pain, observe the effect of drug use, monitor the body temperature and blood pressure, and identify the side effects of drugs. (4) Choose suitable vascular and infusion access according to the nature and frequency of drug use. (5) Reduce unnecessary catheter indwelling, observe vaginal bleeding, do perineal cleaning, maintain knife edge dressing, clean and dry, exudate and replace in time.

Evaluation criterion

According to the notice on the management of clinical application of antibiotics, guidelines for clinical application of antibiotics, combined with the principles of international practice and the actual situation of patients in gynecology and obstetrics department, the evaluation criteria for the application of antibacterial agents were made in table 1.

RESULTS

Selection and use of antimicrobial agents

A total of 10 antimicrobial agents were used in 160 patients, including the first generation of cephalosporins, second generation cephalosporins, third generation cephalosporins, nitramidazole, macrolides and quinolones. Use the highest rate of 5 kinds of antimicrobial agents from high to low is cefaclor sustained release tablets (65.7%), metronidazole (32.5%), cefathiamidine (26.8%), enoxacin (22.5%) and cefoperazone tazobactam sodium (11.8%) (table 2).

Combined use of antibiotics

In 160 patients, hysterectomy in 38 cases, 29 cases of uterine fibroids, the patients were using 2 kinds of antibacterial drugs (41.8%); and 12 patients using 3 kinds of antibacterial drugs (7.5%); 48 cases of patients with cesarean section were not used in combination (30%); 33 cases alone the medication of patients (20.6%). Combined use of antibiotics was shown in table 3.

DISCUSSION

The use of antibiotics in the perinatal period is a necessary measure to prevent infection, but it needs reasonable use (Tural *et al.*, 2015; Sideris *et al.*, 2015). The dosage and type of drug should be strictly controlled. In order to prevent the excessive use of drugs, it may not only cause physiological damage to the pregnant women,

Table 1: Criteria for the application of antimicrobial agents

Index	Reasonable	Unreasonable
Indications	Indication	Nothing
Drug sensitivity index	Yes	Drug resistance
Time of drug use	<2 H	>2 H
Additional clauses	The operation time was greater than 3 h, while additional medication	Operation time >3 h, no additional medication
Stopping time	Cessation of drug use within 48 h after class II incision	48 h after operation of class II incision, still not stop drug use

Table 2: Selection and use of antimicrobial agents

Project	Antiseptic drugs	Times of use	Use ratio
First generation cephalosporins	Ceftazime	43	26.8
Second generation cephalosporins	Cefimazole sodium	11	6.9
	Cefaclor Sustained-release Tablets	105	65.7
Third generation cephalosporins	Cefoperazone tazobactam sodium	19	11.8
Nitazolate	Ornidazole	8	5
	Metronidazole	52	32.5
Macrolide	Azithromycin	4	2.5
Quinolones	Enoxacin	36	22.5

Table 3: Combined use of antibiotics

Project	Cases	Usage rate
Nitazolate + Enoxacin	31	46.2
Nitazolate + ceftazime	14	20.8
Nitazolate+ cephathiamidine + Enoxacin	12	17.9
Nitazolate + cefimazole sodium	7	10.4
Nitazolate + cefoperazone zobactam	3	4.7

but also enhance the resistance of the bacteria (Santos *et al.*, 2003; Shi *et al.*, 2015). According to a lot of clinical tests, obstetrics and gynecology department common pathogens were gram negative bacilli, Enterococcus, anaerobic bacteria, wide spectrum, strong destructive strain with broad-spectrum antimicrobial agents (Sheng *et al.*, 2015). Therefore, strong killing effect, which cephalosporins are widely used, covering species than the whole, and by a large number of clinical confirmed safe and reliable (Seshiah *et al.*, 2002). The study of ornidazole is widely used, but the killing efficacy of this drug is rather weak, which plays a more preventive role (Zhang *et al.*, 2015). It has almost no killing effect against gram-negative bacilli with strong drug resistance and high infection rate.

Antimicrobial agents include β -lactam, aminoglycosides, tetracycline, fluoroquinolones, folate inhibitors, chloramphenicol, glycopeptides and macrolides. In the actual application process, doctors need to according to the actual situation of patients, according to the type of surgery, postoperative infection and drug use and other types of scientific and reasonable choice (Piro *et al.*, 2002). In order to ensure the maximum degree of antibacterial properties, avoid the adverse reaction of allergic reactions, side effects, drug resistance and

unreasonable application of antibacterial use drug. Before the use of antibiotics, doctors should comprehensively evaluate the actual situation and the relationship between the three kinds of antibiotics, the type of the patients and the pathogenic bacteria, and whether the recovery is good or not is also an important content for judging the efficacy of the antibiotics (Santos *et al.*, 2003; Shi *et al.*, 2015). In this study, the combined use of antibiotics in the gynecologic and obstetric surgery patients have been selected scientifically and rationally according to the actual situation of the patients.

The postoperative application of antibiotics is to kill bacteria in surgical site residues, prevent the breeding and spread, when the wound tissue repair after preliminary, mainly rely on the body's immune system to eliminate invading bacteria, and the bacteria in the effective antibiotic concentration in the environment can rarely survive more than 48h (Seshiah *et al.*, 2002). Therefore, it is generally believed that the incision of 48h without infection after operation does not need to be given any antibiotics. Some doctors overemphasize the effect of drug use, continue giving intravenous antibiotics or stopping intravenous administration after operation, until they are discharged from hospital, hoping to prevent the invasion of multiple pathogens and reduce the infection

rate (Piro *et al.*, 2002; Tural *et al.*, 2015; Sideris *et al.*, 2015). However, too long medication time can not only achieve the expected treatment and prevention effect, but increase the incidence of adverse drug reactions, lead to the emergence of drug-resistant bacteria and cause economic waste of patients.

CONCLUSION

There are some unreasonable phenomena in the use of antibiotics during the perinatal period of obstetrics and gynecology surgery, including the prolonged delay in the use of antibiotics. The use of antibiotics is mainly concentrated in ornidazole and cephalosporins and it is easy to induce bacterial resistance. The hospital should improve the consciousness of rational use of drugs and strengthen the administration of antiseptic drugs in the operative period of obstetrics and gynecology. To standardize the application of antibiotics in perioperative period of obstetrics and gynecology, we can improve the irrational use status, reduce the adverse consequences caused by the abuse of antibiotics, improve the quality of medical services, and reduce the cost of medical expenses, and reduce the economic burden of patients. At the same time, should also pay attention to is, on the basis of gynecological surgery postoperative infection is caused by multiple factors, can not rely solely on the use of antimicrobial drugs, should also improve the surgical technique of obstetrics and gynecology doctors, nursing before and after operation, adhere to strict aseptic operation, from the source to control infection for gynecologic surgery after.

At the same time, it is necessary to make full use of antibiotics in order to maximize the efficacy of drugs according to the half-life of drugs. Strict aseptic operation, pay attention to hand hygiene and prevent cross infection in hospital. We should evaluate abdominal pain, observe the effect of strengthening the medication, monitor the body temperature and blood pressure, and identify the side effects of drugs. According to the nature and frequency of drug use, choose suitable vascular and infusion access.

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