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# An Overview of the Rational Use of Antimicrobials in Pediatrics

Zifeng Cai

Department of Pharmacy, Mianzishan People's Hospital, Qiqihar, Heilongjiang, China, Harbin, Heilongjiang, China

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**Abstracts:** Infections are the most common clinical diseases and therefore the most widely treated in the clinic. At the same time, the massive use of antimicrobials has brought confusion and even disaster to the recovery of patients. As we all know, if a large number of antimicrobials are used, it may lead to secondary infections in patients, and in serious cases, it may even affect the safety of patients' lives. At the same time, patients also need to bear the secondary burden of treatment costs, so in response to this situation it is necessary for healthcare professionals to conduct a rational analysis of the utilization of antimicrobials. Due to the blind use of antimicrobials, resulting in an increasing number of drug-resistant strains, in order to effectively control and prevent drug-resistant strains, this paper talks about how to use antimicrobials correctly in the current clinical situation, as well as the principles of the use of antimicrobials in the therapeutic process and the possible adverse consequences.

**Keywords:** Therapeutic principles; Antimicrobial selection; Drug resistance; Drug combinations

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## 1. The applicability of antimicrobial therapy and its side effects

(1) Antimicrobials are generally not suitable for clinical infections, and should not be used in febrile patients with unknown pathology, while testing for allergic reactions to antimicrobials is required in the course of their use.

(2) For pediatric septicemia patients, as well as pediatric pneumonia and toxic dysentery that may cause a large reaction, we should focus on applying powerful bactericidal antimicrobial agents at an early stage, and if necessary, we should also use a combination of drugs to carry out the treatment.

(3) For severe cases or those who have not had good results with long-term medication, replacement of antimicrobial agents can be considered when conditions permit. We can make full use of bacterial culture and drug sensitivity test to judge the treatment, and choose the appropriate antimicrobial agent according to the diagnosis.

In short, the principle of pediatric selection should be: high efficacy, low toxicity, mild and few side effects, and at the same time in the use of drugs try to adopt a more convenient way, try to choose the more cost-effective drugs. Doctors should strictly control the dosage and time of administration, and try not to exceed the dosage to avoid damage to the patient's liver and kidney.

## 2. Controlling the development of bacterial drug resistance

(1) In order to prevent or minimize bacterial resistance, all available drugs should be avoided as much as possible. In the use of drugs also need to take into account the principle of personalization, especially for pediatric patients, in the use of drugs to avoid drugs that may contain toxicity.

(2) In the use of drugs should first consider an antimicrobial drug, if an antimicrobial drug has already produced the effect should be discontinued to use the later auxiliary drugs.

(3) Adequate dosage and duration of therapy are necessary to maintain effective antimicrobial concentrations and effects.

(4) For pediatric patients, long-term use of drugs should be minimized to avoid serious effects on pediatric patients. Antimicrobial infections can be treated with high doses of drugs or with combinations of drugs to inhibit antimicrobial strains and control infections.

## 3. Principles of Combined Use of Drugs

(1) The purpose of the combination of drugs: In order to obtain the synergistic effect of antibacterial, it is also necessary to minimize the toxicity in the process of use, so as to avoid the use of the drug to the patient to bring serious adverse reactions.

(2) The effect of the combination of drugs: the combination of drugs can occur synergistic, cumulative, ineffective and antagonistic

phenomenon. Therefore, in this process, we can usually adopt the form of synergistic effect of bactericides and bacteriophages to produce cumulative effect, in the process of treatment, we generally do not use bactericides and bacteriostatic agents, mainly because of bactericides and bacteriostatic agents may lead to antagonistic effect.

(3) Joint drug indications: ① the use of a single drug can not effectively achieve the therapeutic purpose, in the treatment of the time we should use a combination of therapeutic forms to carry out effective treatment, some common pediatric pathology such as pediatric septic meningitis, bacillary dysentery, etc., the use of a single therapeutic modality can not achieve therapeutic effects. ② There are also some that can not be treated with a single antimicrobial agent, such as pediatric pneumonia combined with diarrhea. ③ Some pediatric diseases whose etiology is not known, but which can bring serious consequences, such as toxic dysentery, sepsis, and so on. ④ Prevent pediatric patients from developing drug resistance due to long-term use of drugs.

(4) The combined use of precautions: ① for the routine treatment of general infections do not need to be combined; ② in the use of drug-resistant combination of drugs will generally be limited to two, for three or more kinds of antimicrobials we generally do not use the form of combined use of drugs. ③ In the intravenous injection of special patients also need to pay attention to the interaction of different drugs and the possible adverse effects. ④ The preventive application of antimicrobials, we need to use antimicrobials in accordance with the unified standards for control, in the process of using the drug to strictly control the amount of drugs. ⑤ Antimicrobials need to avoid secondary infections and allergic reactions when they are used crosswise, and at the same time, the dosage needs to be strictly controlled.

#### **4. Principles of antibiotic use**

(1) First of all, we should strictly grasp the use of indications, contraindications, select the most sensitive to the pathogenic bacteria and the least side effects on the patient's antimicrobial drugs, in the use of antimicrobials in the process, health care workers should be timely detection of the patient's own resistance to changes, as well as the patient's own resistance to timely detection;

(2) Finally, it is also necessary to pay attention to the disadvantages of improper dosage in the process of patients' medication. Therefore, it is necessary to strictly control the use of antimicrobials in the process of treatment, from the macro or micro control, strict control of the time of use. The most important thing is to master the use of antimicrobials with or without, how much to use, how long to use, in the selection of anti-infective drug varieties should not be changed frequently, generally we will observe the time control in 3 days, mainly because 3 days can be on the therapeutic effect of antimicrobials have a full understanding. Especially for children, the elderly, pregnant women, lactating mothers, these four categories of people should be used with caution.

#### **5. Consequences after irrational use of antimicrobials**

In the process of treatment if there is irrational use of drugs, not only will give the patient an increased burden, but also delay the best treatment time of the disease, the use of medication is not symptomatic, the dosage and the course of treatment is not appropriate, but also on the efficacy of the drug will have an impact; mainly because we often use the drugs with a certain degree of toxicity, so in the process of using the drug is very easy to occur toxic side effects, especially for those who are using large quantities of drugs, it is more likely to produce. The main reason is that the drugs we often use are toxic to a certain extent, so it is very easy for toxic side effects to occur in the process of using drugs, especially for those drugs that are used in large quantities, it is easier to produce side effects. Unreasonable use of drugs can also cause drug-borne diseases, wasting medical resources and increasing the economic burden of patients. Therefore, it is required that health care personnel should always take the patient as the core in the process of treatment and make a set of reasonable treatment plan according to the actual situation of the patient, and at the same time, it is also necessary to continuously strengthen the research on pharmacy to improve the level of rational use of medication.

#### **6. Conclusion**

In conclusion, the rational use of antibiotics is an issue that both hospital administrators and clinical staff should seriously face, which is related to whether mankind will return to the "antibiotic-free era", and also concerns the safety of people's lives and properties. Therefore, it is required that health care personnel should always be patient-centered in the treatment of patients and reasonably manage the use of antibiotics, and also need to develop a set of appropriate management measures and methods, according to the actual treatment of the patient's treatment, and effectively control the use of antibiotics in the production of drug infections. There is still a long way to go, both in terms of drug management and combination of drugs, to avoid the abuse of drugs and the use of drugs in an irregular manner, so that the therapeutic effect of patients can be maximized.

## References

- [1] Sun Aiyun, Zhao Xuguo. Rational application of antibiotics in pediatrics[J]. China Modern Drug Application, 2010, 04(13):101-102.
- [2] Deng Ying, Wang Yuan, Liu Qiowen et al. Survey and analysis of respiratory nurses' implementation of patients' safe eating behavior[J]. General Practice Nursing, 2024, 22(05):979-983.
- [3] CHEN Danhong, MU Jian. Application of antimicrobial drugs in 87 cases of pneumonia patients in the department of respiratory medicine[J]. Clinical rational drug use, 2024, 17(07):119-122. DOI:10.15887/j.cnki.13-1389/r.2024.07.035.
- [4] Wang Lingyan. Application of "patient-centered" Chinese medicine nursing concept in creating a model ward[J]. Journal of Chinese Medicine Management, 2024, 32(03):99-101. DOI:10.16690/j.cnki.1007-9203.2024.03.034.
- [5] Zhou Meifang, Guo Xiaoping, Liang Chunlei et al. Evaluation of the effect of emergency nursing intervention for critically ill patients in respiratory care[J]. Marriage and Health, 2024, 30(02):178-180.