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Pharmacological Action and Clinical Application of Sedative Hypnotics Commonly Used in Clinic

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Abstract

Sedative hypnotic drugs are one of the most commonly used drugs in clinic, and have extensive and far-reaching research value. Several common sedative and hypnotic drugs in clinic, including benzodiazepines (diazepam, fluzepam, nitrazepam, etc.), barbiturates and others. This paper summarizes the representative drugs diazepam and phenobarbital, in order to guide doctors to use drugs correctly in clinic and improve the therapeutic effect of patients.

Keywords

Sedative Hypnotics; Diazepam; Phenobarbital.

1. Introduction

Sedative and hypnotic drugs are a kind of drugs with inhibitory effect on the central nervous system. Small doses cause quiet or sleepiness, showing sedative effect; Larger doses cause similar physiological sleep, namely hypnotic effect. They are used to treat mental diseases and do not affect the normal activity of the brain. However, while playing a therapeutic role, sedatives will also have various adverse reactions, especially improper use will lead to poisoning and poisoning.

2. Representative Drugs

2.1. Diazepam

Benzodiazepines are typical representative drugs, also known as diazepam. Oral absorption is rapid and complete, while intramuscular absorption is slow.

Pharmacological and clinical effects:

① Anti anxiety effect: it can be used to treat anxiety disorders. ② Sedative and hypnotic effect: it can be used for sedation, hypnosis and administration before anesthesia. ③ Anticonvulsant and antiepileptic effects: it can be used for febrile convulsion and drug toxic convulsion in children; Intravenous injection of this drug is the first choice for the treatment of status epilepticus. ④Central muscle relaxation: it can alleviate a variety of muscle tension enhancement caused by central neuropathy or muscle spasm caused by local lesions (such as lumbar muscle strain). ⑤ Others: a larger dose can reduce blood pressure and slow down heart rate; Administration before anesthesia can reduce the dosage of anesthetics; Reduce the secretion of digestive juice and protect peptic ulcer.

Mechanism of action:

Diazepam can enhance central inhibitory neurotransmitters γ- Neurotransmitter function and synaptic inhibitory effect of aminobutyric acid (GABA). After diazepam binds to its receptor, it further promotes the binding of GABA and GABAA receptor, so as to increase the frequency of Cl channel opening, make more CL influx and produce central inhibitory effect.

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Adverse reactions:

① General adverse reactions: drowsiness, dizziness, fatigue, memory loss, etc.; ② Allergic reactions: such as rash, leucopenia, etc.; ③ Intravenous injection can cause local pain or thrombophlebitis occasionally; too fast injection can cause inhibition of respiratory and circulatory functions, and can seriously cause respiratory and cardiac arrest. ④ Long term application can produce tolerance, and withdrawal symptoms can occur once it is stopped.

Diazepam and midazolam belong to benzodiazepines. Their combination has synergistic effect, which can increase the tolerance and cooperation of patients during microscopic examination. The data showed that after the combination of drugs, most patients (82.57%) were in sedation level II and light sleep. During the operation, they can also assist in examination (treatment) according to the instructions of the operator. It is conducive to the smooth progress of examination (treatment). Postoperative sleep can relax and rest the nervous system of patients in a tense state. In addition, the anterograde amnesia effect of midazolam helps to eliminate the patient's memory of the examination (treatment) process. Patients are not afraid to operate endoscopy and are willing to accept endoscopy again. When diazepam and midazolam are combined, the biggest concern is whether it will produce severe hypoxemia due to excessive inhibition of respiratory center (SaO2 < 90%).

2.2. PagaPhenobarbital

Phenobarbital is a barbital sedative and sleeping drug, which can be easily absorbed by oral or intramuscular injection.

Pharmacological action:

It generally inhibits the central nervous system and has the effects of sedation, hypnosis, anticonvulsion, epilepsy, anesthesia and so on.

Mechanism of action:

① In the absence of GABA, barbiturates simulate the effect of GABA, increase CL permeability and hyperpolarize cell membrane; ② Prolonging the opening time of Cl channel and increasing the opening frequency; ③ Attenuate or block the excitatory response caused by depolarization after glutamate acts on the corresponding receptor.

Adverse reactions:

Aftereffects: hangover ② Tolerance ③ Dependence ④ Large doses can inhibit the respiratory center ⑤ A few people can have allergic reactions after taking them;

Poisoning and rescue:

For acute poisoning, rescue measures should be actively taken to maintain respiratory and circulatory functions, keep the respiratory tract unobstructed, take oxygen, and perform artificial respiration or tracheotomy when necessary. Central stimulants such as sodium bicarbonate and other alkaline drugs can also be used. Severe poisoning can be treated with dialysis.

This drug can reduce the metabolism of brain cells after the use of phenobarbital, which can quickly reduce the blood consumption of brain cells. In addition, phenobarbital can protect nerve block cells, reduce the impact of nerve impulse on patients' cerebral cortex, and play a sedative and anticonvulsant role. However, phenobarbital also has obvious defects. The treatment of infantile convulsion takes a long time and can not play an anticonvulsant role in time. The patient's condition is easy to relapse and the long-term curative effect is poor. Therefore, the combination of phenobarbital and diazepam can play a synergistic and complementary role of the two drugs and achieve better results.

After 94 children with convulsion were studied, they were randomly divided into control group and study group, with 47 cases in each group. The control group was treated with diazepam, and the study group was treated with phenobarbital combined with diazepam. The clinical

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efficacy, control time of convulsion symptoms, laboratory related indexes and recurrence rate were compared between the two groups. Results the total effective rate of the study group was significantly higher than that of the control group ($P < 0.05$). The control time of convulsion symptoms in the study group was shorter than that in the control group, and the difference was statistically significant ($P < 0.05$). Seven days after treatment, NSE, BDF and S-100 water in the two groups were lower than those before treatment, and that in the study group was lower than that in the control group ($P < 0.05$). It shows that the combination of phenobarbital and optic disc can better exert the effects of sedation, sleep and anti vertigo. In addition, after one month of follow-up, the recurrence rate in the study group was lower than that in the control group, and the difference was statistically significant ($P < 0.05$). It shows that the combined application of phenobarbital and diazepam can give better play to the synergistic effect, prolong the action time, better control the convulsion symptoms and avoid the recurrence of the disease. In conclusion, the implementation of phenobarbital combined with diazepam in the treatment of emergency pediatric convulsions can further improve the serological indexes of patients, shorten the time of symptom control, further improve the symptoms of convulsions, improve the clinical efficacy and reduce the recurrence rate, which has high clinical promotion value.

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