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Analysis on 115 cases of adverse reactions caused by azithromycin

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This study talks about the usage and adverse reactions of azithromycin, and provide references for clinically safe, rational and effective drug use and also to make statistics and analysis on the cases of adverse reactions caused by azithromycin in our hospital in recent 5 years. The main adverse reactions of azithromycin are allergic reaction, gastrointestinal damage, neurotoxicity, etc. Doctors and patients should pay attention to the adverse reactions of azithromycin and take certain measures to reduce or avoid the adverse reactions.

Key words: Azithromycin, adverse reaction, preventive measures.

INTRODUCTION

Azithromycin is a 15-membered ring macrolide antibiotic. It has many advantages, such as being not influenced by gastric acid for oral administration, good absorption, high blood concentration, wide distribution *in vivo*, high tissue fluid concentration, long half-life, fast acting for intravenous infusion, etc (Escudero et al., 2006). It has broad-spectrum antibacterial effects and is mainly used for respiratory tract (Baschiera et al., 2002), skin, soft tissue and other infections (Shen et al., 2010). Because azithromycin is widely used in clinical, the adverse reactions occur more frequently.

MATERIALS AND METHODS

Data

The cases were collected using azithromycin in our hospital in 2005 to 2010 and statistics were made on the records of the adverse reactions which occurred.

Experimental

Patients' ages, gender, primary diseases, medications and clinical manifestations of the adverse reactions were analyze according to the adverse drug reaction determination standards specified by the State Adverse Drug Reaction Monitoring Center.

RESULTS

Table 1 represents the age and gender distribution.

It was found in the cases of adverse drug reactions that the reasons for medical care are mostly respiratory tract infection (Table 2).

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Table 1. Age and gender distribution.

Age	Gender		Proportion (%)
	Male	Female	
<10	15	22	32.17
11~20	3	5	6.95
21~30	8	14	19.13
31~40	2	3	4.35
41~50	4	6	8.69
51~60	3	8	9.56
>60	10	12	19.13
Total	45	70	100

Table 2. Primary diseases.

Primary disease	n	Proportion
Respiratory tract infection	38	33.04
Urinary system infection	27	23.48
Reproductive system infection	21	18.26
Skin infection	5	4.34
Concurrent infection with hypertension and coronary heart disease	10	8.69
Gastrointestinal infection	9	782
Others	5	4.34
Total	115	100

Table 3. Clinical manifestations of adverse reactions.

Type of adverse reactions	Clinical manifestation	n	Proportion (%)
Allergic reactions	Drug rash, delayed allergy (deleted)	39	33.91
Liver and gall digestion	Liver damage, toxic hepatitis and acute cholecystitis	25	21.74
Nervous system	Abalienation, apsychia and blurred vision	18	15.65
Urinary system	Hematuria, proteinuria and renal injury	8	6.96
Cardiovascular system	Hypotension, arrhythmia and sinus bradycardia	5	4.35
Blood system	Leucopenia and thrombocytopenia	3	2.61
Musculoskeletal system	Muscle soreness and joint pain	2	1.73
Others	Palpitation, short breath, collapse and black coat on the tongue	15	13.04

As regards medication, the reported 115 cases include 32 cases of oral administration and 83 cases of intravenous infusion. Regarding the aspect related to the allergic history, 75 cases have no allergic history, 30 allergic history, 30 cases have allergic history, and the other 10 cases are unclear. The clinical manifestations of adverse reactions are shown in Table 3.

DISCUSSION

Relationship between age and gender and adverse reactions

It can be seen from Table 1 that patients less than 10 years old have higher incidence of adverse reactions caused by azithromycin, mainly gastrointestinal adverse reactions. Because gastrointestinal development and liver microsomal enzyme reaction rate in children do not reach adult level, children are high-risk population of gastrointestinal adverse effects (Hao, 2009). In medication, we must prevent the occurrence of adverse reactions of the system. Over high dosage in infant medication is also one of the reasons that cause adverse reaction. Thus, we should be careful about preventing the occurrence of adverse reactions in the system when in medication (Adam and Hen, 2008). It can be seen from gender that female children susceptibility is slightly higher than male, and the specific reasons need further study.

Relationship between primary diseases and adverse reactions

The reported 115 cases are mainly respiratory system, reproductive system and urinary system infections, indicating that this drug is active on respiratory system pathogens, such as mycoplasma pneumoniae and chlamydia pneumoniae for atypical pneumonia; common urinary and reproductive system pathogens, such as chlamydia trachomatis, ureaplasma urealyticum, non-drug-resistant gonococci, etc; skin and soft tissue infections (Zhang and Zhou, 2011).

Relationship between medications and adverse reactions

It can be seen from the above data that adverse reactions caused by intravenous infusion is significantly severe than oral administration. This may be related to fast absorption of intravenous medication, and drug stimulating blood vessels can lead to phlebitis. Different dosage forms have different metabolic rates in body (Whittlesey and Shea, 2004; Chen and Liang, 2006). In addition, related literatures report that infusion rate has influence on the adverse reactions of azithromycin, which in the high rate group is significantly severe than that in the low rate group (Liang and Zhou, 2007), suggesting that in clinical drug use, under the premise of not influencing efficacy, oral administration is the first choice, intramuscular injection is the second, and intravenous infusion is the third. If intravenous infusion is required for condition needs, the infusion rate should be strictly controlled (Yuan and Li, 2009).

Clinical manifestations of adverse reactions

It can be seen from Table 3 that the adverse reactions are mainly manifested as allergic reactions and gastrointestinal reactions. The literatures report some rare adverse reactions, for example, ankle joint pain occurs after intravenous infusion and increases after continuous drug use (Wang et al., 2006), symptom of limb convulsion occurs twice after intravenous infusion (Li, 2006), oral ulcer (Xu and Li, 2009), drunken-like reaction (Dong and Yang, 2006), tongue tip numbness (Mao, 2008), toxic hepatitis (Hao, 2003), renal failure (Gao, 2002) and deafness (Cervin, 2001) occur in some patients. The adverse reactions caused by azithromycin are diversified, so medical care staff and patients need to use it with caution.

Effective measures to prevent adverse reactions

At first, doctors and patients should strengthen professional knowledge learning, master the best indications of antimicrobial agents, emphasize on etiological examination, learn about the dynamic characteristics of various types of antibiotics, standardize dosage, route of administration and interval time, and try to improve the level of use of antibiotics to ensure rational and effective drug use. Reasonable compatibility can reduce the incidence of adverse reactions. Sinus tachycardia, recurrent ventricular premature and ventricular premature bigeminy and trigeminy caused by azithromycin injection are eliminated after drug discontinuity and intravenous infusion of 5% glucose injection plus adenosine triphosphate (ATP), coenzyme A and vitamin C (Wang and Wang, 2011). Montmorillonite powder has inhibition effect on gastrointestinal adverse effects caused by azithromycin (Zhang and Zhou, 2011).

Secondly, patients should carefully read the drug instructions and rationally use drugs according to doctor's instruction. Thirdly, because people only know little about drug application and knowhow but not the why, they buy and take drugs according to experience or advertisements, delay the illness, and miss the best treatment time. When going to hospital for diagnosis, patient should tell doctors his/her own family history, allergic history and drugs used before visiting, to help doctors make an accurate diagnosis and take effective treatment measures.

Conclusion

In summary, the action mechanism of azithromycin is to bind with 50S ribosomal subunits in bacterial cells, hinder the process of bacterial peptide transfer and inhibit RNA-dependent protein synthesis, to achieve the antibacterial effects (Reynolds and McKee 2009; Zou and Zhou, 2007). Moreover, due to changes in structure, it has a broader antibacterial spectrum, can inhibit a variety of gram-positive cocci, mycoplasma, chlamydia and legionella pneumophila, especially, it has good antibacterial activity on some important gram-negative bacilli, such as haemophilus influenzae, and makes up the disadvantage that macrolides have poor effects on haemophilus. Meanwhile, with the antibacterial spectrum expansion and the use frequency increase, its adverse reactions also increase, so one should be careful while using it.

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