

Medication Compliance and Influencing Factors in Patients with Coronary Heart Disease

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Abstract: Coronary heart disease (CHD) is one of the chronic cardiovascular diseases with a high disability rate, high morbidity, and high mortality worldwide. Long-term drug management is of great significance to control the disease, reduce the recurrence rate of cardiovascular events, and improve the quality of life of patients. However, the drug compliance of patients with CHD is generally not high, and the current situation is worrying. Studies have shown that there are differences in drug compliance among patients in different regions and different age groups. This study reviewed the concept of coronary heart disease, the concept and connotation of medication compliance, the analysis of medication compliance status of patients with coronary heart disease and the analysis of influencing factors, providing basis for clinical medical staff to quickly screen out high-risk patients with low compliance, and to carry out early and accurate intervention, in order to effectively improve patient medication compliance, improve long-term prognosis, reduce readmission rate and medical burden.

Keywords: Coronary heart disease; Medication compliance; Influencing factors

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1. Introduction

Coronary heart disease (CHD) is coronary atherosclerosis caused by multiple risk factors, leading to heart disease caused by myocardial ischemia and hypoxia^[1]. It is one of the leading causes of death from cardiovascular disease worldwide, with more than 8 million people dying annually from coronary heart disease-related events, 40% of whom are aged 65 and older^[2].

With the rapid development of China's social economy, significant changes in residents' lifestyle and the acceleration of the population aging process, chronic non-communicable diseases have become a major public problem threatening national health, among which the incidence and mortality of coronary heart disease continue to rise, which has become a major public health problem in China^[3]. According to the data from the *China Cardiovascular Health and Disease Report 2023*^[4], the number of patients with coronary heart disease in China

has exceeded 13 million, and the number of new cases exceeds 1 million every year. The disease burden accounts for more than 35% of all cardiovascular diseases, which not only seriously affects the quality of life and life safety of patients, but also brings heavy economic pressure to families and social medical systems.

In the treatment system of CHD, drug therapy is the main way of clinical treatment of CHD at present, and it is the basic means for disease prevention, acute control, and long-term management. It has irreplaceable effects on controlling disease progression, reducing recurrence of cardiovascular events, improving patients' quality of life, and reducing mortality. Therefore, the drug treatment regimen recommended by clinical guidelines includes antiplatelet drugs, statins, beta blockers, and other key drugs, which is the key guarantee to delay the progression of atherosclerosis and prevent thrombosis. However, due to the complexity of coronary heart disease, patients often take longer medication time and take more types of drugs, which makes some patients have poor medication compliance and affects the treatment effect ^[5].

Medication compliance refers to the process of patients accepting, agreeing with, and accurately implementing medical protocols, including following correct medication time, dosage schedule, follow-up schedule, and observing dietary contraindications of specific drugs ^[6], and its level is directly related to treatment effect and patient quality of life ^[7]. At present, there are significant deficiencies in medication compliance of patients with coronary heart disease at home and abroad, and different characteristics are presented due to multiple factors such as economic development level, medical system structure, residents' health literacy, social and cultural background, etc. It is of great practical significance to systematically sort out the status quo of medication compliance of patients with coronary heart disease and deeply analyze its influencing factors for optimizing chronic disease management strategies and improving medical service quality. Therefore, this article provides evidence for optimizing drug management, improving drug compliance, improving long-term prognosis, reducing readmission rate, and medical burden.

1.1. Connotation of medication compliance

Medication compliance was first defined by the World Health Organization in 2003 as “the extent to which patients make treatment, care and lifestyle changes in accordance with the recommendations of health professionals,” and then specifically to the process of patient acceptance, acceptance and accurate implementation of medical protocols, including compliance to correct medication timing, dosage schedule, follow-up schedule, and compliance to dietary contraindications for specific drugs ^[5].

1.2. Status quo of medication compliance in patients with coronary heart disease

Coronary heart disease is a chronic cardiovascular disease with a high incidence in the world. Patients with CHD face the challenge of drug compliance. Studies in different countries and regions are based on differences between medical systems and social backgrounds. China is mainly restricted by weak grass-roots management, an imbalance of urban and rural resources, and cognitive deviation, while foreign developed countries focus on fine management optimization. For example, the United States establishes an “electronic health records + medication reminder system” to connect patient medication data with a medical institution information platform in real time. Medical staff can monitor patient medication in real time through the system, and intervene through SMS and app push for missed medication behavior. In addition, developing countries face the dual dilemma of drug access and lack of basic care. A survey in India showed that only 45% of patients have continuous access to standardized treatment drugs, and drug prices are too high. Over time, many socio-economic and clinical factors have been

identified that affect drug compliance^[8].

As a large population country, the base of CHD patients is huge. In clinical practice and community management, the drug compliance of CHD patients in China is not optimistic. For clinical studies on medication for CHD carried out in different countries and regions, although the baseline characteristics of the population in each study have certain differences, the incidence rate of each endpoint event has obvious differences, which may be due to the differences in the understanding of medical staff and patients on medication for CHD in different regions, resulting in obvious differences in medication compliance. For example, a survey of 248 patients with CHD showed that only 21.37% of patients had high drug compliance, 43.55% had medium drug compliance, and 35.08% had low drug compliance^[9]. Another example, a survey of 195 elderly patients with coronary heart disease hospitalized in Affiliated Hospital of Shandong University of Traditional Chinese Medicine from February to August 2022 showed that the drug compliance of elderly patients with CHD was only 29.2%^[10]. A large number of studies have shown that CHD is a long-term chronic disease, and the medication time is relatively long. During this period, it is affected by many factors. A considerable proportion of patients have the phenomenon of missing medication, wrong medication, self-reduction, or discontinuation, which seriously affects the treatment effect, leads to repeated illness, increased readmission rate, and even increased death risk^[11], and brings a heavy burden to the patient's family and social medical system.

2. Patients' predisposing factors

2.1. Demographic factors

Sociodemographic factors associated with medication compliance in patients with coronary artery disease included age, sex, education level, marital status, etc. The prevalence rate of young and middle-aged patients with CHD was lower than that of elderly patients, and the drug compliance was better. Older people with coronary artery disease have low levels of education and face barriers to acquiring knowledge, which may further limit their understanding of medication. However, older patients with good financial status have a more positive attitude towards medication compliance^[12].

Widowed patients with coronary heart disease have poorer medication compliance than married patients. This conclusion is highly consistent with the research results of Feng *et al.*^[13], further confirming that partners have irreplaceable positive effects in improving patients' medication compliance. Two-way care and mutual assistance brought by marriage, on the one hand, spouses will naturally assume the role of medication supervisor during the medication process of patients, and timely reminders can effectively reduce the occurrence of forgetting and missing medication in daily life. On the other hand, the companionship and love of the partner will enhance the patient's confidence and psychological comfort in treatment, promote the patient's expectation of returning to a healthy state^[14], and thus actively adhere to standardized medication.

2.2. Socioeconomic factors

Socioeconomic factors are the key external variables affecting the medication compliance of patients with CHD, which are directly related to whether patients can continue to use drugs regularly and have an important impact on the treatment effect and prognosis. Especially in areas with low reimbursement rates of medical insurance and imperfect chronic disease protection policies, patients often reduce or stop drugs without authorization due to the inability to afford medical expenses, or choose cheap alternatives with unknown efficacy, which directly reduces

compliance.

According to a large number of studies, when patients have low monthly income and no medical insurance, they are affected by economic influence and have poor compliance behavior ^[15]. Imbalance of medical resource allocation exacerbates compliance differences. Adequate drug resources and professional medical staff are gathered in cities and high-quality medical institutions, so patients can easily obtain drugs and medication guidance; however, in rural and grass-roots areas, the drug reserves are insufficient, the professional ability of medical staff is limited, patients often face difficulties in obtaining drugs and the medication questions cannot be solved in time, resulting in the decline of medication compliance.

2.3. Cognitive factors of disease

Disease cognition level is the core internal factor determining medication compliance of patients with coronary heart disease, which directly affects patients' medication attitude and behavior choice, and plays a fundamental role in treatment compliance. Studies show that most patients have poor medication compliance, with the highest proportion of "whether to stop medication due to self-conscious symptom improvement." It can be seen that patients often stop medication due to subjective condition improvement because they have no obvious symptoms ^[16], which directly leads to low medication compliance. Secondly, some patients' lack of cognition of drug effects and adverse reactions also significantly affected compliance. Patients do not know about drugs (such as antiplatelet drugs, lipid-regulating drugs) specific efficacy, do not know the necessity of standardized medication to control the disease, think that excessive use of drugs will produce adverse reactions, resulting in discontinuation of use, do not understand lipid regulation in addition to lowering cholesterol, but also can stabilize plaque, slow down the progression of coronary artery plaque, reduce the incidence of cardiovascular events ^[17]. This is not only the patient's lack of understanding of coronary heart disease and its drugs, but also the lack of trust and support for medical staff. Therefore, establish a harmonious nurse-patient relationship, strengthen communication with patients, especially emphasize the importance of taking medicine on time and according to the amount, and improve patients' understanding of diseases and drugs ^[15].

2.4. Pharmacologic factor

Adverse drug reactions are important factors affecting the decrease in medication compliance, directly affecting the willingness of patients to continue taking drugs, and then interfering with the treatment effect. Long-term medication can cause rash, sensory nerve disorder, alopecia, headache, fatigue, gastrointestinal discomfort, constipation, abdominal pain, and other adverse reactions, resulting in poor patient compliance ^[18]. For example, antiplatelet drugs (such as aspirin) in clinical practice are prone to gastrointestinal discomfort, including stomachache, nausea, gastrointestinal bleeding, etc.; lipid-regulating drugs (such as statins) may cause abnormal liver function and muscle soreness; antihypertensive drugs (such as beta blockers) may cause fatigue, dizziness, slow heart rate, and other symptoms. These adverse reactions not only affect the quality of life of patients but also make patients fear or resist drugs. Moreover, some patients adjust the dose or discontinue the drug because they cannot tolerate the side effects of the drug, which seriously affects the treatment effect.

2.5. Social and support system factors

2.5.1. Family support system

The improvement of the family support system has a significant effect on medication compliance of patients with

coronary heart disease. Related studies have pointed out that insufficient family care is an independent risk factor for poor medication compliance of patients with coronary heart disease. In the actual scene, family members can promote patients to adhere to medication by reminding them to take medicine, assisting in drug management, providing emotional support, etc., providing practical assistance, and guaranteeing the treatment effect.

2.5.2. Healthcare system support

The core of the healthcare system support is embodied in two dimensions: the quality of doctor-patient communication and the effect of medication guidance. Studies have shown that patients' lack of trust in medical staff is closely related to low compliance. High-quality doctor-patient communication can improve patients' trust and acceptance of treatment programs, thereby improving compliance and standardizing medication. In addition, patients' initiative to obtain medical health knowledge is also a risk factor of poor compliance, reflecting that patients have an important role in the effectiveness of their own medication management.

2.6. Tools for assessing medication compliance

According to the World Health Organization, "Accurate assessment of compliance behavior is essential for effective and efficient treatment programs to assess whether changes in health outcomes benefit from treatment programs."

Morisky Medication Compliance Scale Eight-Item (MMAS-8) was developed by Morisky *et al.* [19] and is mainly used to evaluate patients' medication behavior and compliance disorders. After testing, the Chinese version of the scale has a Cronbach's α coefficient of 0.776 and an ICC of 0.854 ($P < 0.05$), with good reliability and validity [20]. There are 8 items in this scale, of which items 1–7 are two-category scores, the answers are "no" with 0 points, "yes" with 1 point, item 5 is reverse score; item 8 adopts Likert 5-grade scoring method, the answers are "never," "occasionally," "often," and "always" with 1, 0.75, 0.50, 0.25, and 0 points, respectively. Evaluation criteria: 8 points as good compliance, 6–8 points as moderate compliance, 0–6 points as poor compliance.

2.7. Measures to improve drug compliance and their effects

At present, during the period of patients in hospital or seeing a doctor, a good trust relationship between doctors and patients is established, effective health education is carried out, and at the same time, psychological support is given by family members to comfort and provide humanistic care for widowed and divorced patients, so as to reduce patients' loneliness. However, when drug management is carried out alone at home, after a period of time, drug compliance may decrease slowly due to gradual improvement of physical condition, change of medication regimen, change of medication environment, and change of psychological factors. In addition, personalized services can be developed, not only by relying on the patient's "initiative," through the joint model: Hospital-community-family multi-party collaborative intervention closely connects patients' lives, doctors diagnose diseases and formulate treatment plans, community family doctors act as "coordinators" between doctors and patients for disease knowledge health education, home or telephone follow-up and medication guidance, formulate effective personalized plans, improve medication compliance, improve prognosis, reduce readmission rate and medical burden through SMS reminders, medication form records, compartment kits and other ways. However, the system of family doctors in China is immature and faces realistic challenges.

3. Conclusion

To sum up, CHD is a common chronic cardiovascular disease, standardized medication is the key to controlling the disease progression and reducing the occurrence of acute cardiovascular events, but the overall low compliance with clinical medication has become a prominent problem in the global public health field. Demographic and sociological factors, cognitive factors, adverse drug reactions, and social and supportive factors are important factors affecting drug compliance in patients with coronary heart disease, which provide evidence for clinical medical staff to quickly screen out high-risk patients with low compliance. In addition, through hospital-community-family joint intervention, personalized medication scheme can be formulated closely around patients' lives, and doctor-patient communication bridge can be established through community family doctors, so as to not only carry out personalized health education and optimization of medication scheme, but also formulate targeted effective response scheme, improve medication compliance through SMS reminder, medication form record and other ways, so as to improve prognosis and reduce readmission rate and medical burden.

Disclosure statement

The authors declare no conflict of interest.

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