Efficacy of Paroxetine Combined with Comprehensive Psychological Nursing in Patients with Coronary Heart Disease Complicated with Depression

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To investigate the effect of paroxetine combined with comprehensive psychological nursing on coronary heart disease patients with depression is the objective of the study. A total of 160 patients with coronary heart disease complicated with depression were randomly divided into research group (n=80) and control group (n=80). The control group received paroxetine under conventional treatment. The research group was supplemented with comprehensive nursing intervention on the basis of the control group. The total response rate of different medication regimens in the two groups was evaluated. Hamilton anxiety scale and Hamilton depression scale were used to assess the anxiety of the subjects, Pittsburgh sleep quality index was used to assess the sleep quality of the two groups of patients, self-rating anxiety scale and self-rating depression scale were used to evaluate the mental state of the patients. The treatment cycle is 60 d. After treatment, the Hamilton anxiety scale, Hamilton depression scale, Pittsburgh sleep quality index, self-rating anxiety scale and self-rating depression scale scores of the study group were significantly lower than those of the control group and the total effective rate of the study group was significantly higher than that of the control group ($p<0.05$). Paroxetine has a certain curative effect in the treatment of patients with coronary heart disease complicated with depression, but the effect is better when supplemented with comprehensive psychological nursing, which can more effectively relieve anxiety and improve sleep quality.

Key words: Paroxetine, psychological care, coronary heart disease, sleep quality, depression, anxiety

Coronary heart disease is difficult to cure and other characteristics will easily lead to depression and depression will also increase the risk of coronary heart disease. A study found that elderly patients with depression are twice as likely to suffer from coronary heart disease[1]. Some scholars have pointed out that the incidence of depression in patients with coronary heart disease is 18 %-60 % and the incidence of anxiety is 28 %-70 %[2]. One investigation concluded that patients with coronary heart disease are very prone to anxiety and depression, and this situation is more common in women and the elderly[3]. The high incidence of coronary heart disease in depressed people are thought to be mainly related to hyperactivity of Hypothalamic-Pituitary-Adrenal (HPA) axis and sympathetic nerve, enhanced platelet activity, tissue oxidative stress and vascular endothelial dysfunction[4]. In the treatment, anti-anxiety and depression drugs are used mainly and there are various types of drugs including selective serotonin reuptake inhibitors, benzodiazepines, flupentixol and melitracen. Among them, selective serotonin reuptake inhibitors are the most widely used new anti-anxiety and depression drugs. It selectively blocks the reuptake of 5-Hydroxytryptamine (5-HT) in the presynaptic membrane, thereby increasing the content of 5-HT in the central nervous system to achieve anti-depressant action[5]. Furthermore, selective serotonin reuptake inhibitors have a negligible effect on dopamine and norepinephrine and they are less likely to increase cardiovascular loading and improving drug safety. This class of drugs mainly includes paroxetine, fluvoxamine, fluoxetine, sertraline, citalopram and escitalopram. These drugs are known as the six golden flowers of antidepressant. These drugs are currently used as the drug of choice for coronary heart disease complicated with depression. Studies have shown that the antidepressant effects of all the above-

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mentioned drugs are almost equivalent and the safety is very high, but paroxetine has a quick effect and is more selective to 5-HT and it can bind to G protein-coupled receptor kinase 2. The inhibitory effect occurs more directly and the myocardial contractility of heart after myocardial infarction is also improved[6]. Therefore, paroxetine has more research value. Psychological nursing is a scientific treatment plan aimed at the psychological state of the patient. On the one hand, it helps to alleviate the depression of patients and improve medication compliance and on the other hand, it helps to improve the efficacy of drugs. Based on this, this study listed paroxetine as a research drug, supplemented by comprehensive psychological care.

MATERIALS AND METHODS

Sources of research materials:

The research objects include 160 patients with coronary heart disease complicated with depression were treated in our hospital from January 2020 to December 2022. These research objects were randomly divided into research group and control group with 80 patients in each group. Basic information of the research group include 36 males and 44 females with average an age of 61.28±4.36 y, the mean duration of illness was 5.42±3.18 y, the mean duration of depression was 1.87±0.34 y and the mean duration of insomnia was 1.18±0.27 y. In the control group, there were 35 males and 45 females with an average age of 61.32±4.28 y, the mean duration of illness was 5.36±3.17 y, the mean duration of depression was 1.86±0.33 y and the mean duration of insomnia was 1.19±0.26 y. There was no significant difference in these basic data ($p>0.05$).

Inclusion and exclusion criteria:

Inclusion criteria: Coronary heart disease was clinically diagnosed by our hospital, Hamilton Anxiety scale (HAMA) score≥25 points judged as depression and insomnia according to the "Classification and Diagnostic Criteria of Mental Disorders in China", patients should not be under therapy with antidepressant drugs within 30 d before the study, acknowledge and sign the informed consent form for this study.

Exclusion criteria: Patients with liver and kidney dysfunction, other mental diseases and other serious immune system diseases.

Methods:

All patients were given conventional basic treatment for coronary heart disease. Specifically, aspirin, 100 mg orally once a day; atorvastatin, 20 mg orally once a day; isosorbide mononitrate sustained-release tablets, 10 mg orally in the morning and evening; metoprolol sustained-release tablets, 12.5 mg orally in the morning and evening, each time. The course of basic medication is 60 d.

The control group was given paroxetine (manufactured by Zhejiang Huahai Pharmaceutical Co., Ltd., 20 mg×14 tablets, approved by the National Drug Administration H20031106) on the basis of conventional medication. The initial dose of paroxetine is 20 mg per day, orally after breakfast. When the curative effect is unsatisfactory, the dose needs to be increased in the 3rd w of medication and the maximum daily dose should not exceed 40 mg. The total medication cycle is 60 d.

The research group received comprehensive psychological nursing on the basis of the control group. Specific methods included in the study are mentioned below.

Psychological intervention: Because the patient's condition relapses, it is highly difficult to completely cure while the patient is prone to negative emotions of anxiety and depression. Therefore, nursing staff should actively listen to the patient's talk, introduce relevant knowledge such as coronary heart disease and depression to the patient, so that the patient can fully understand the cause of the disease and related complications which helps to build patients confidence, accept medication treatment with an optimistic attitude and minimize the symptoms caused by the disease.

Sleep guidance: Instruct patients not to overeat at dinner and pay attention to a light diet, not to engage in exciting activities, not to drink tea or alcohol before going to bed. Along with that instruct patients to take a hot bath, soak their feet in hot water before going to bed and to take hypnotic drugs as directed by the doctor. Correct the bad sleeping posture behavior of patients and help them establish healthy sleeping behavior.

Relaxation training: Instruct patients to do more relaxation exercises such as Tai Chi, slow dancing, deep breathing, limb relaxation exercises, listening to light music, etc. Avoid exercising before going to bed at night and listen to some light music appropriately.

Health education: Instruct patients on healthy diet, correct breathing methods, proper cardiovascular protection and healthy sports.

Efficacy evaluation:

Depression, anxiety and insomnia were obviously relieved or disappeared, which was regarded as marked effect. Depression and anxiety, insomnia symptoms were significantly improved as effective. Depression symptoms and insomnia symptoms were not significantly improved, and it was considered invalid.

Total effective rate=Marked rate+Effective rate.

The judgment of using different scales should be judged according to the evaluation criteria of each scale.

Quality control:

Preparation stage: Researchers should strengthen the theoretical study of depression, insomnia-related knowledge and be able to accurately distinguish between depression and insomnia. For the selection of psychological scales, the opinions of psychiatrists and psychologists should be listened to determine the HAMA, Hamilton Depression Scale (HAMD), Pittsburgh Sleep Quality Index (PSQI), Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale (SDS) scores.

Operation phase: All researchers should be familiar with how to use each scale after learning. During the operation, the researcher should instruct the patient how to fill in the scale throughout the process and can give correct answers to the questions raised by the patient. Along with that researchers should fully communicate with the patients, gain the full trust of the patients and let the patients actively cooperate with the statistical work of the scale.

Statistics stage: The researchers should maintain objectivity in the statistics of each scale to ensure the integrity and correctness of the data. Two researchers are required to make statistics separately. Once there is an inconsistency, they should check and correct the statistical errors in time.

Statistical analysis:

Using statistical software analysis, t-test or Chi square (χ^2) test were conducted and $p<0.05$ was regarded as a statistically significant difference.

RESULTS AND DISCUSSION

Comparison of the treatment effect of the two groups of patients was shown here. The total effective rates of the two groups were 93.75 % and 53.75 %, respectively. The number of patients in the study group was higher ($p<0.05$) (Table 1).

Comparison of depression mood before and after treatment in two groups of patients was shown in Table 2. There was no significant difference in the scores of HAMA and HAMD between the two groups before medication ($p>0.05$). After medication, the HAMA and HAMD scores of both groups decreased, but the decline rate was faster and the score was lower in the study group ($p<0.05$). This shows that paroxetine has a certain effect on alleviating depression, but the effect will be better when it is supplemented with comprehensive psychological care.

Comparison of scores of sleep quality before and after treatment in the two groups was shown in Table 3. The sleep quality factors of the two groups such as the time to wake up and the number of wake-ups were all reduced after treatment; the sleep efficiency and sleep maintenance rate were all improved. However, after treatment, the study group had shorter wake-up time and fewer wake-ups, higher sleep efficiency and sleep maintenance rate ($p<0.05$). This shows that paroxetine has a certain effect on improving sleep quality, but auxiliary effect of comprehensive psychological care will be significantly improved.

Comparison of PSQI scores before and after the quality of patients in the two groups was shown in Table 4. The score of PSQI factors and total scores of PSQI in 2 groups were basically the same before medication ($p>0.05$). These scores were reduced in both groups after medication and even lower in the study group. This suggests that paroxetine is very helpful in improving sleep quality. After the end of different medication regimens, there were significant differences in scores between the two groups, indicating that the study group supplemented with psychological intervention may improve the efficacy and relieve the mood of patients ($p<0.05$).

Comparison of SAS and SDS scores between the two groups before and after treatment was shown in Table 5. SAS and SDS are self-rating scales for anxiety and depression, respectively. Before treatment, there was no significant difference in SAS and SDS scores between the two groups ($p>0.05$). After treatment, the SAS and SDS scores

of the two groups were significantly reduced. This shows that whether it is paroxetine monotherapy or supplemented with psychological care on the basis of monotherapy, it is effective in alleviating anxiety and depression in patients. However, compared with the two groups after treatment, the two scores of the study group were lower and there was a significant difference between the two groups ($p<0.05$). This shows that the combination of paroxetine monotherapy and comprehensive psychological care can more effectively alleviate the anxiety, depression symptoms of patients.

In today's China, with the gradual improvement of people's living standards, the incidence of coronary heart disease is also increasing. More unfortunately, more young people suffer from coronary heart disease. There are many discoveries in the study of drug use in coronary heart disease including traditional Chinese medicine, Western medicine and combination of Chinese and Western medicine. But there is a problem which we need to be addressed i.e. depression in patients with coronary heart disease. The pharmacologists seem to have missed the point and clinicians also seem to be ignoring the problem. But the reality is that a patient's depression can affect medication adherence and even medication durability. Therefore, it is worth of further research regarding the mental problems of patients with coronary heart disease.

TABLE 1: COMPARISON OF EFFECTIVE RATES OF DIFFERENT MEDICATION REGIMENS BETWEEN THE TWO GROUPS ($\bar{x}\pm s$)

Group	n	Markedly effective	Efficient	Invalid	Total effective rate
Research group	80	38 (47.5 %)	37 (46.25 %)	5 (6.25 %)	93.75 %
Control group	80	22 (27.5 %)	21 (26.25 %)	37 (46.25 %)	53.75 %
χ^2					9.48
p					<0.05

TABLE 2: COMPARISON OF DEPRESSIVE MOOD BEFORE AND AFTER TREATMENT BETWEEB THE TWO GROUPS (POINTS, $\bar{x}\pm s$)

Group	n	HAMA		HAMD	
		Before treatment	After treatment	Before treatment	After treatment
Research group	80	29.17±2.26	10.32±1.85	30.28±3.41	9.56±1.62
Control group	80	29.28±2.27	19.34±1.28	30.31±3.42	20.08±2.13
t		0.124	8.976	0.118	9.678
p		>0.05	<0.05	>0.05	<0.05

TABLE 3: COMPARISON OF SLEEP QUALITY BEFORE AND AFTER MEDICATION BETWEEN THE TWO GROUPS ($\bar{x}\pm s$)

Group	Wake up time (min)		Wake up times (frequency)		Sleep efficiency (%)		Sleep maintenance rate (%)	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Research group	62.45±7.54	18.92±2.12	4.86±0.76	1.87±0.28	66.43±3.54	84.63±2.91	72.17±4.24	91.28±3.25
Control group	62.88±7.56	35.92±4.32	4.87±0.75	2.96±0.46	66.52±3.47	77.53±3.21	72.21±4.35	82.76±3.54
t	0.108	9.124	0.186	6.448	0.102	3.586	0.106	4.214
p	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

TABLE 4: COMPARISON OF PSQI SCORES BEFORE AND AFTER MEDICATION BETWEEN THE TWO GROUPS (POINTS, $\bar{x}\pm s$)

Factor	Research group		Control group	
	Before treatment	After treatment	Before treatment	After treatment
Sleep quality	2.42±0.31	0.76±0.18^{b1}	2.41±0.31	1.42±0.26^{b}
Bedtime	2.51±0.29	1.62±0.21^{b1}	2.52±0.29	1.96±0.24^{b}
Sleeping time	2.39±0.32	1.24±0.28^{b1}	2.38±0.31	1.89±0.27^{b}
Sleep efficiency	2.44±0.35	1.18±0.12^{b1}	2.43±0.34	1.86±0.31^{b}
Sleep disorder	2.42±0.28	1.36±0.22^{b1}	2.41±0.29	1.87±0.28^{b}
Hypnotic drugs	2.46±0.27	1.32±0.25^{b1}	2.45±0.26	1.93±0.24^{b}
Day function	2.52±0.32	1.58±0.24^{b1}	2.53±0.32	1.84±0.22^{b}
PSQI total score	17.17±0.31	9.12±0.23^{b1}	17.16±0.31	12.76±0.26^{b}

Note: Compared with before treatment, $^{b}p<0.05$ and compared with the control group, $^{b1}p<0.05$

TABLE 5: COMPARISON OF SAS AND SDS SCORES BEFORE AND AFTER TREATMENT BETWEEN THE TWO GROUPS (POINTS, $\bar{x}\pm s$)

Group	n	SAS		SDA	
		Before treatment	After treatment	Before treatment	After treatment
Research group	80	58.26±6.17	30.87±3.62	56.75±4.52	32.52±3.14
Control group	80	58.32±6.12	41.36±2.98	56.68±4.49	40.08±4.23
t		0.146	4.365	0.138	3.962
p		>0.05	<0.05	>0.05	<0.05

After taking paroxetine, it is easy for patients to absorb and at the same time, it has almost no effect on the efficacy of antacid drugs and food. According to the literature, the elimination half-life ($t_{1/2ke}$) duration of male patients was 19.74 h after oral administration of 40 mg of paroxetine hydrochloride and the maximum serum drug concentration of 31.01 ng/ml arrived at 5.3 h[7]. Studies have also shown that it takes 10 d for healthy men to reach the pre-medication level after oral administration of 30 mg of paroxetine hydrochloride and the plasma protein binding rate reaches 95 % and is distributed in all organs of the body including the central nervous system[8]. Studies have shown that paroxetine has the effect of anti-platelet aggregation and can also inhibit inflammatory factors and provide cardiovascular protection[9]. It reduces the content of catecholamine's in the patient's body by relieving anxiety and stabilizing the patient's mood, thereby reducing myocardial oxygen consumption, improving coronary blood supply and reducing angina pectoris in patients with coronary heart disease[10]. The choice of antidepressant drugs must be based on the presence of cardiovascular damage. Patients with coronary heart disease complicated with depression are older and have cardiovascular disease. Although classic tricyclic antidepressants have significant antidepressant effects, they have been found to have many adverse reactions in clinical practice, so they have been phased out[11]. As a new type of antidepressant, paroxetine has few adverse reactions, well tolerated and is convenient to use. It has been widely recommended. Some researchers studied the efficacy of paroxetine on patients with coronary heart disease complicated with depression and found that after taking paroxetine for 1 mo, various indicators such as cardiac preload and post load, cardiac output and blood pressure were significantly improved[12]. In the long run, paroxetine can also reduce the adverse events of coronary heart disease and heart failure.

The pathogenesis of coronary heart disease caused by depression is still unclear, but studies have shown that it may be related to the overexpression of the sympathetic nervous system and the HPA axis[13]. Depression often activates the sympathetic system leading to an imbalance between sympathetic and parasympathetic, which causes changes in the autonomic tone of the heart. Some researchers have also pointed out that the HPA axis function is very hyperactive in patients with depression, which promotes the production and release of a large number of adrenal cortex hormones. The confusion occurs with thickening the blood and greatly increasing the risk of coronary heart disease[14]. Conventional

drug treatment of coronary heart disease combined with depression can only alleviate the symptoms of coronary heart disease, but it is difficult to have a drug effect to relief depression. Not only that, if depression is not alleviated, the efficacy of conventional drugs for coronary heart disease will be greatly reduced. This is related to multiple factors such as patient's medication compliance and negative emotions affecting drug efficacy. Paroxetine is effective in treating coronary heart disease complicated with depression. In order to improve the antidepressant effect, some researchers have found that paroxetine increases the level of neurotrophic molecules by increasing the activity of hydrogen peroxide and superoxide dismutase, thereby causing the central nervous system neurons to shrink to a certain extent and to protect the hippocampal nerves[15]. A study comparing the efficacy and acceptability of 21 antidepressant drugs indicated that compared with other antidepressants, paroxetine had better efficacy and lower discontinuation rate[16]. There are also studies comparing new antidepressants with placebo and it is found that the use of new antidepressants is better in patients with coronary heart disease complicated with depression[17]. In this study, paroxetine was also effective in treating depression so paroxetine hydrochloride is the right medication for depression.

In this study, HAMA, HAMD, PSQI, SAS and SDS scores of the two groups of patients were almost the same before medication. After medication, scores of the study group, namely paroxetine hydrochloride combined with comprehensive psychological care group, were lower than those of the control group, indicating that the study group had better effects on anti-depression and improving sleep quality. There are many studies on psychological nursing to relieve depression and improve sleep quality in patients. Some scholars believe that psychological factors play a very important role in the occurrence and development of sleep disorders in patients with coronary heart disease[18]. Some scholars pointed out that drug therapy has certain side effects and interventional therapy is likely to cause a certain degree of damage to the blood vessel wall, while psychological intervention can enable patients to understand the knowledge of disease treatment, reduce the impact of negative emotions, improve treatment compliance and along with that after the patients are discharged from the hospital, they can also develop good living habits and further consolidate the results of treatment[19]. Studies have shown that active psychological care can affect the patient's cerebral cortex-hypothalamus-limbic system, thereby promoting the secretion of endorphins and inhibiting catecholamines, reducing the effect of excitatory sympathetic nerves, helping patients to establish an effective psychological defense mechanism, able to calmly deal with symptoms and rectify incorrect psychological emotions[20].

In this study, paroxetine alone has a certain effect on patients with coronary heart disease complicated with depression, but the effect is better when combined with comprehensive psychological nursing. Therefore, for patients with coronary heart disease complicated with depression, in addition to paroxetine, comprehensive psychological intervention should also be combined to improve the effect of medication. There are also some shortcomings in this study. First, there is no discussion on the mechanism of action between conventional drug use and paroxetine hydrochloride in the treatment of coronary heart disease and there is no study on whether the adverse reaction of patients is due to use of conventional drugs or paroxetine hydrochloride. Second, there is no study on the therapeutic effect of combined psychological nursing on the basis of conventional drug use. Third, the problem of medication compliance has not been studied. In the follow-up research center, on the one hand, the sample size should be increased while on the other hand, a variety of different programs should be studied.

Conflict of interests:

The authors declared no conflict of interest.

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