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Clinical effect analysis of patient with coronary heart disease after coronary intervention therapy

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Abstract

To explore the effectiveness and safety of the patients with coronary heart disease after coronary intervention therapy. 140 patients with coronary heart disease hospitalized and randomly divide them into observation group and control group with 70 patients respectively. Give coronary intervention therapy to the 70 patients in the observation group, and give drug therapy to the 70 patients in the control group. Compare the overall effective rate, survival rate and occurrence probability of complications of the two groups. The overall effective rate of patients in observation group reaches 92.86%, while the rate of patients in the control group only reaches 81.43%. Through data comparison of these two groups, it is found that the overall effective rate of the control group is far less than that of the observation group, so does the survival rate within 1 year; the differences between the two groups are statistically significant (P<0.05). although the occurrence probability of complications of the observation group is less than that of the control group, their difference is not statistically significant (P>0.05). The effect of coronary intervention therapy for patient with coronary heart disease is better than the effect of drug therapy, and both therapies have equivalent safety.

Keywords: coronary heart disease; coronary intervention therapy; effect.

Pratical Application: The treatment effect of coronary intervention therapy on Coronary heart disease CHD patients is better than that of the drug therapy, and both therapies have equivalent safety.

1 Introduction

Coronary heart disease (CHD) is a type of heart disease caused by myocardial ischemia, anoxia or necrosis due to vessel lumen stenosis or occlusion arising from atherosclerotic lesion of coronary artery vessels. As the most common cardiovascular disease, CHD has currently become one of the main factors which cause death or disability around the world, thus earning the title of the "top killer of human". In recent years, with the development of society and economy in China, the aging of population presents an accelerating trend, people's lifestyles and diets also change a lot, the mortality rate and prevalence rate of CHD increase year by year, and more and more young people begin to suffer from CHD, making CHD a main factor which seriously threatens the human health (Li, 2012). As the medicine progresses continuously, people work out the coronary intervention therapy technology; the rise and development of this technology bring the treatment of CHD into a new field, obviously improve the clinical symptoms of CHD patients, and significantly improve the living quality and survival rate of the patients (Wen, 2013). However, because the coronary intervention therapy is traumatogenic to some extent, this article explores the effectiveness and safety of CHD patients after receiving coronary intervention therapy. Below, we will give a detailed report according to the above study.

2 Materials and methods

2.1 General information

We selected 140 CHD patients hospitalized from January 2017 to December 2018, all patients met the criteria for coronary heart disease specified in the *Study on Cardiovascular and Cerebrovascular Diseases* (Chen, 1988); the physical quality and other conditions of the patients conformed to the criteria for receiving coronary intervention therapy, and the patients had never suffered from severe hepatic or renal failure, concomitant malignant tumor or concomitant peptic ulcer disease, and was for the first time to receive the stenting treatment; the patients or their families were voluntary to accept this treatment, fully understood the treatment protocols and the risks in the treatment process, and signed the informed consents. Among the selected 140 patients, there were 76 male and 64 female patients with an age ranging from 41 to 89, the average age was (61.33 ± 13.94); they had been suffering from CHD for 0.5 to 2 years, the average number of years was (1.46 ± 0.45). We divided all eligible CHD patients into the observation group and the control group, each group contained 70 patients; the patients in the observation group received coronary intervention therapy, while the patients in the control group received drug therapy. Through comparing the general information of these two groups of patients, we found that they had no significant statistical difference (P>0.05), so that these two groups were comparable. The study was approved

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by The People's Hospital of Danyang; The Affiliated Danyang Hospital of Nantong University. Informed consent was obtained.

2.2 Method

Control group: we gave single drug therapy to all patients in the control group, which was in strict accordance with the standards or requirements in CHD treatment guidelines; based on the physical conditions of the patients, conventional treatment protocols such as oxygen inhalation, nitrates, antithrombotic drugs, fibrinolytic drugs, lipid-modulating therapy, β-blocker, calcium channel blocker, renin angiotensin inhibitor were given. However, it should be noted that the β-receptor blocker shall be forbidden or used with caution for the patients with asthma, peripheral vascular diseases and chronic trachitis; low blood pressure should be prevented when using renin angiotensin system inhibitor. During the treatment process, we formulated reasonable treatment protocols according to the physical conditions of the patients, paid close attention to the situations of the patients during the treatment, executed follow-ups after treatment, recorded the overall effective rate, survival rate, occurrence probability of complications and cardiac function indices of the patients before and after the treatment, analyzed the data and drew the conclusion.

Observation group: coronary intervention operation was given to all patients in the observation group. The specific operation procedures are as follows

Before operation

Before the operation, the attending doctor should ask the detailed medical history of the patient, carefully examine the physical conditions of the patient, check the blood routine examination, urine routine examination, routine blood biochemistry, ultrasonic cardiogram, ECG and chest X-ray of the patient, and if necessary, carry out treadmill exercise test, etc. Through a series of routine examinations, we got a comprehensive understanding of all aspects of the physical conditions of the patients, and then formulated the treatment protocols suitable for each patient according to the above data obtained. All patients should receive routine basic drug treatment before coronary intervention operation: 1 day before operation, the patients started to take enteric coated aspirin (300 mg after the meal every day), 300 mg clopidogrel or ticagrelor. If clopidogrel is needed, the patient can take clopidogrel one day before the operation, the dosage is 300 mg; on the day of operation, the patient can take 300 mg enteric-coated aspirin, 250 mg ticlopidine or 75 mg clopidogrel to fully inhibit the platelet aggregation, reduce the thrombus embolism forming in the coronary artery vessels, and prevent myocardial ischemia. However, because aspirin will cause side effect of gastrointestinal reaction, and even upper gastrointestinal hemorrhage in serious cases, the patients with gastrointestinal disease or upper gastrointestinal hemorrhage should also take the drugs for protecting gastric mucosa, such as sucralfate and H2 receptor antagonist. If upper gastrointestinal hemorrhage occurs before operation, the patient does not need to take aspirin, but only takes ticlopidine or clopidogrel, and then receives the intervention operation. However, as ticlopidine has the side effect of inhibiting hematopoietic system, especially it will cause granulocytopenia and thrombocytopenia and cause harm to the liver function, and the occurrence probability of the side effects of clopidogrel is less than that of ticlopidine, periodical reexaminations of hemogram and liver function will be required after either of these two drugs is taken. In the meantime, in order to guarantee the success of coronary intervention operation, before operation, except for the above drugs, the patients should also take the drugs which can effectively control other related diseases, especially the anti-hypertension, antianginal, cardiotonic and antiarrhythmic drugs, and properly control the glycemic index. Also, we should carry out iodine allergy test, skin preparation and on-bed defecation training for the patients, inform the patients of the main operation procedures and the reasons and solutions for any discomfort which may occur during the operation, and guide the patients to practice overcoming the discomfort, so that the patients can cooperate in the operation. During the operation, one attending doctor and one assistant, one nurse, one electrocardiograph monitoring technician, and one X-ray technician are needed. The attending doctor and assistant are mainly responsible for preoperative discussion, formulating operation protocol, recording operation process, finishing the result report, and observing the changes in conditions at any time. The nurse is mainly responsible for participating the preoperative discussion and acquiring the treatment protocol, preparing the devices, puncture needles, dilators, guide wire, dressing and catheters, preparing necessary drugs, getting ready for participating in accidental rescue at any time as required by the attending doctor, and accomplishing the cleaning, disinfection and operating room arrangement after operation. The electrocardiograph monitoring technician is mainly responsible for connecting and monitoring the electrocardiograph, recording and reporting the cardiac rhythm of the patient to the attending doctor, and timely discovering the arrhythmia condition. X-ray technician is mainly responsible for inspecting the machine before operation to guarantee the X-ray machine, cinematograph, high pressure injector, TV set and video system can operate normally; for X-raying and video playback during the operation; for inspecting the machine again after operation to guarantee there is no error. Except for the above preparations, before operation, epinephrine, dolantin, nitroglycerine, propafenone, lidocaine, noradrenaline, diazepam, nifedipine, coraminum, dopamine, dexamethasone, atropine and other related drugs should be prepared; defibrillator, trachea cannula, temporary pacemaker and oxygen inhalation system should be all in readiness.

During operation

After finishing all preoperative preparation works, we carried out formal intervention operation to the patient. After the patient entered the operating room, the operator should correctly connect the ECG monitor to normal state at the fastest speed, the nurse should cooperate with the attending doctor to accomplish the preoperative disinfection and preparation, and prepare the sterile bed sheet. At the start of the operation, we injected heparin (100 u/kg) through artery sheath catheter, and added 1000 u for every additional hour. We used Philips large-scale angiography machine, adopted Seldinger method

(Yang et al., 2006), and selected femoral artery or radial artery as the approach; after selecting the puncture point, we used 1% lidocaine for local anaesthesia, then used scalpel tip to cut a 3 mm incision, threaded the No. 18 puncture needle into the artery through that incision, and fed the guide wire and artery sheath successively; with the support and guiding of J-shaped guide wire, we sent the left and right angiography catheters from artery sheath to the coronary artery sinus at the aortic root, and then extracted the guide wire; we sent the radiography catheters to the incisions of left and right coronary arteries, and injected contrast medium for angiography; after angiography, we extracted the angiography catheters, extracted artery sheaths, and pressed the arterial puncture site for 15-20 minutes. Pressure bandaging was applied at puncture site for 6-12 h, and the patient lay flat on the bed for 24h. After angiography, we used quantitative computer analysis system to determine the degree of coronary artery stenosis according to the generated results: if the degree of coronary artery stenosis is greater than or equal to seventy-five percent, it can be diagnosed as single-vessel disease, double-vessel disease or triple-vessel disease. After diagnosis, we carried out vessel puncture, guided the guiding catheter to the coronary artery site through the guide wire, utilized the shape of the guide wire to pass across the lesion, pushed in the PTCA balloon until balloon dilatation, and then fed the stent into the narrow vessel. After the operation, we pressed the puncture site, pressurized the puncture site, and bound up the wound. During the operation, the contrast medium will be rapidly injected into the coronary artery in a short time, which will lead to ischemia in coronary artery, thus causing myocardial anoxia and changes in electrocardiogram; as different patients may suffer from different degrees of cardiovascular diseases, some patients will also encounter too high ST segment or too long duration of depression. Therefore, for patients with sustained severe ischemia, after injecting the contrast medium, we asked the patient to cough more to increase the pressure inside the thoracic cavity, so as to drain the noise contrast medium in the coronary artery as soon as possible, and to recover blood supply of heart within the shortest time.

After operation

After the operation, we periodically observed whether the patient suffered angina attack or not, and monitored whether abnormal change appeared on the electrocardiogram, the dynamic change of myocardial enzyme and the platelet count. After the patient discharged from hospital, we conducted periodical telephone follow-ups, and acquired whether angina recurred within 1-3 months, the changes of dynamic electrocardiogram, the incidence rates of acute coronary syndrome and cardiac sudden death, and the readmission rate through outpatient follow-ups. We recorded the overall effective rate, survival rate, occurrence probability of complications and cardiac function indices of the patients before and after the treatment, analyzed the data and drew the conclusion.

Criteria for quantizing patient treatment effect

At present, the criteria for evaluating the treatment effect of coronary heart disease by percutaneous coronary intervention mainly consists of the following contents: firstly, evaluate according to the patient's feelings, which mainly include the comparison of physical conditions, before and after the operation, conditions and number of times of the occurrence of angina; generally, the treatment effects mainly include excellent, effective and ineffective (Li, 2008). Excellent mainly refers to that after treatment and with the same exercise time and mode, the two groups of patients do not suffer angina or experience over 80% reduction of the number of times of angina attack; effective mainly refers to that after treatment and with the same exercise time and mode, the two groups of patients experience 50% to 80% reduction of the number of times of angina attack; ineffective mainly refers to that after treatment and with the same exercise time and mode, the two groups of patients experience less than 50% reduction of the number of times of angina attack, and some patients' conditions even aggravate; secondly, evaluate according to some periodical clinical examinations, which mainly include the changes of blood pressure, blood lipid and blood glucose; thirdly, evaluate according to some auxiliary examinations, which mainly include electrocardiogram, myocardial enzymogram and echocardiography. If abnormal result appears, execute coronary angiography again according to the actual conditions to further confirm the conditions inside the stent; fourthly, evaluate according to the follow-up conditions of the patient after discharge, as the two groups of patients will receive one-year follow-up after completing their respective treatments, we can sort out the overall effective rate, survival rate, complication probability of the patients before and after treatment according to such follow-up records, and then compare and analyze to draw the conclusion.

2.3 Data statistics

In this article, we utilized SPSS 17.0 statistics software to analyze the data, and checked the enumeration data by x^2 test; the test criterion was set as $\alpha=0.05$, the differences between two groups were statistically significant when $P<0.05$.

3 Results

3.1 Comparison of treatment effects between two groups

Based on the data recoded by the medical workers after two groups of patients received their respective treatments, we concluded that: among 70 patients in the observation group, 48 patients achieved significant effect, 17 patients achieved effective effect, and 5 patients achieved ineffective effect; among 70 patients in the control group, 35 patients achieved significant effect, 20 patients achieved effective effect, and 15 patients achieved ineffective effect. Therefore, 65 patients in the observation group achieved overall effective effect, the number in the control group is 55. We made Table 1 according to the above data.

3.2 Data input

Firstly, open SPSS data editor, click variable view tag, and define the variable to be input: use g to represent grouping variable (1: the observation group, 2: the control group), r to represent treatment effect (1: significant, 2: effective, 3: ineffective), and f to represent frequency; finally click the data view tag, and input the data needed (see Figure 1)

Table 1. Comparison of effects between two groups after treatment.

Group	Significant	Effective	Ineffective	Total	Overall effective rate/%
Observation group	48	17	5	70	92.86
Control group	35	22	13	70	81.43
Total	83	39	18	140	87.14

Based on the data in Table 1, we utilized rank sum test in SPSS 17.0 statistics software to analyze all data, the specific operating steps were as follows.

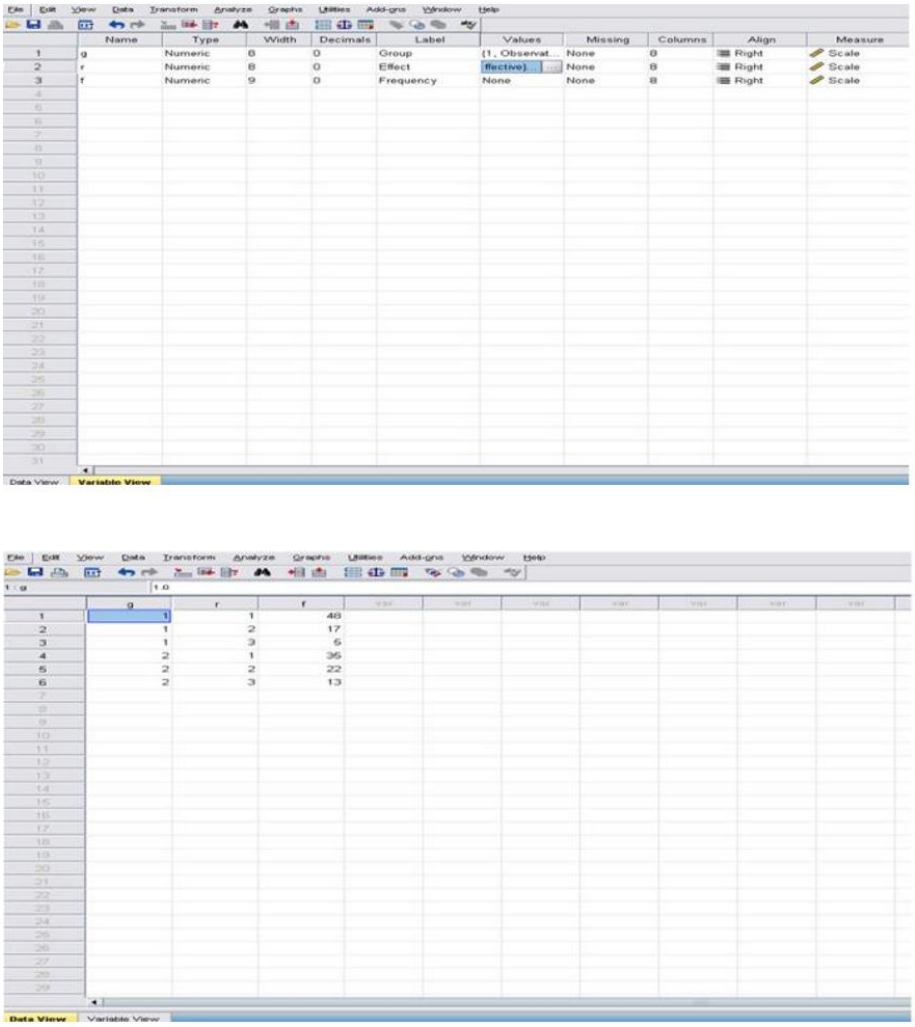

Figure 1. Define variables and input data.

3.3 Data analysis

① Firstly, click the data tag in the box, and then click weighted case tag; click the weighted case tag to choose weighted case, choose Frequency f as the frequency variable, and finally click OK to execute analysis(see Figure 2)

② Firstly, click the nalyze tag in the box, click the non-parametric test, and click 2 independent samples; after clicking the test of 2 independent samples, select treatment effect r as the test variable, select group g as the grouping variable; then, open the Define Groups dialog box, define the minimum value as 1 and maximum value as 2 ; click Continue to return to the main dialog box, then check the Mann-Whitney U test, and finally click OK to execute analysis (see Figure 3).

3.4 Output statistical result

After executing data analysis, we made Table 2 and Table 3.

Based on Table 2 and Table 3, the observation group contains 70 cases in total, the rank average is 63.21, and the sum of ranks is 4424.50; the control group contains 70 cases in total, the rank average is 77.79, and the sum of ranks is 5445.50. The values of test statistics Mann-Whitney U, Wilcoxon W and Z are 1939.500, 4424.500 and -2.428 respectively; the double-

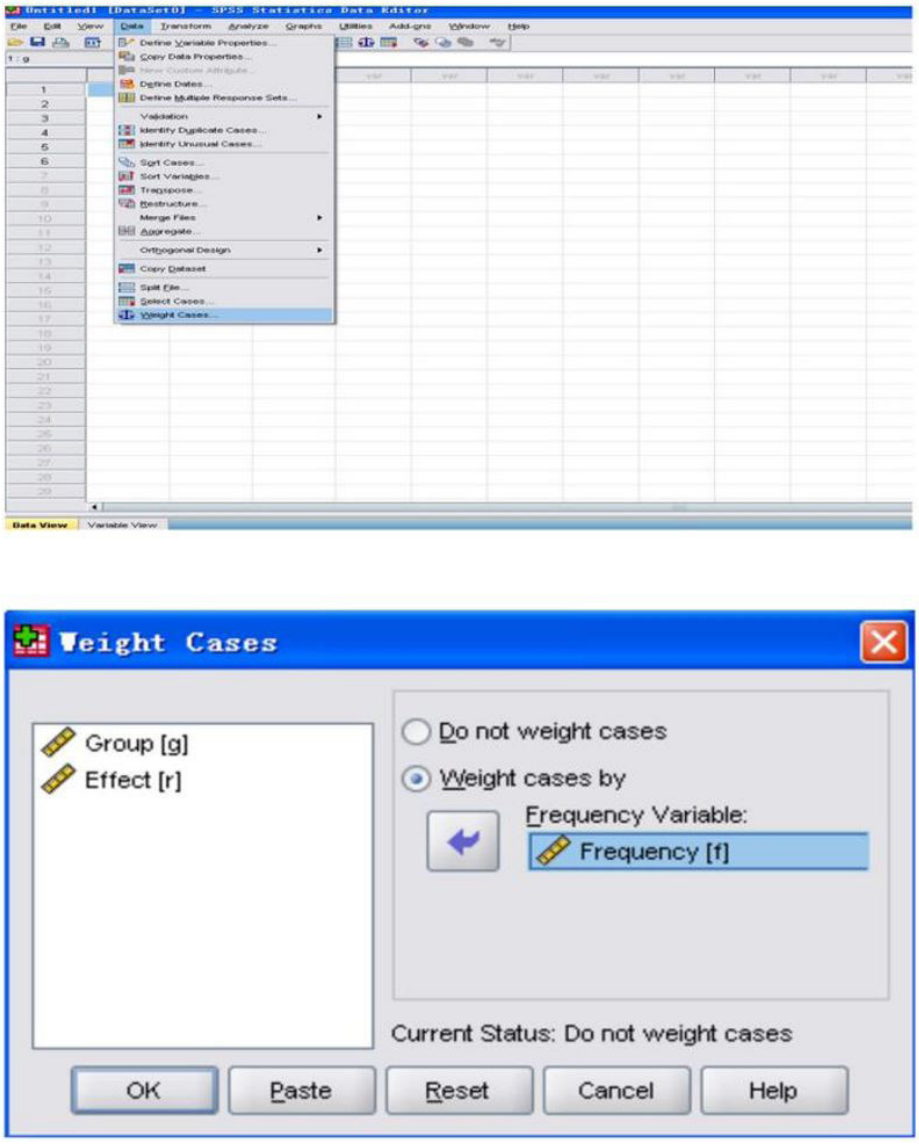

Figure 2. Selection of data weight case.

side P value is 0.015, if α=0.05, then P<0.05, the differences in treatment effects of two treatment methods are statistically significant. The rank average of the observation group (63.21) is less than the rank average of the control group (77.79), so that the treatment effect of the observation group is more significant than that of the control group.

3.5 Comparison of survival rates between two groups

Based on the data of 1-year follow-up visits received by the patients in two groups after the treatment, we concluded that 40 patients in the observation group survived (total number of patients: 70), the survival rate of the observation group was 57.14%; 18 patients in the control group survived (total number of patients: 70), the survival rate of the control group was 25.71%. Therefore, the survival rate of patients in the observation group was better than that of the control group, and the difference between groups was of statistical significance.

3.6 Comparison of complication rates between two groups

Based on the records of 1-year follow-ups to the patients of two groups, we concluded that: in the observation group, after receiving coronary intervention operation, 5 patients suffered arrhythmia, 4 patients suffered heart failure, and 5 patients suffered recurrent angina pectoris; in the control group, after receiving drug therapy, 6 patients suffered arrhythmia, 5 patients suffered heart failure, and 4 patients suffered recurrent angina pectoris. Table 4 was obtained from the above data.

3.7 Data input

Firstly, open SPSS data editor, click variable view tag, and define the data: use group to represent grouping variable

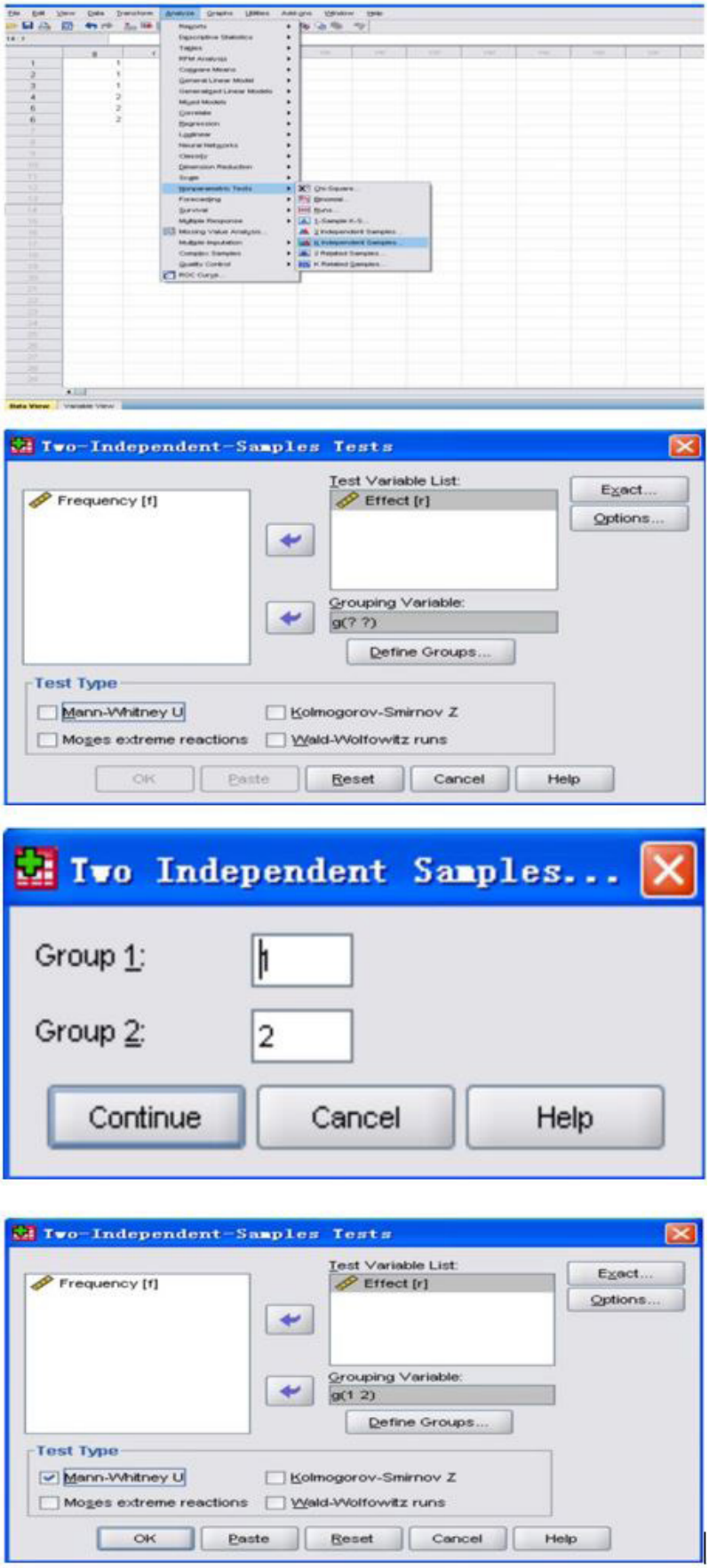

Figure 3. Rank sum test for comparison of two independent samples.

Table 2. Rank.

	Group	N	Rank average	Sum of ranks
Treatment effect	Observation group	70	63.21	4424.50
	Control group	70	77.79	5445.50
	Total	140		

Table 3. Test statistics[a].

	Treatment effect
Mann-Whitney U	1939.500
Wilcoxon W	4424.500
Z	-2.428
Progressive significance (double-side)	.015

a. Grouping variable: group

Table 4. Comparison of the number of complication-suffering patients between two groups.

Group	Arrhythmia	Heart failure	Recurrent angina pectoris	Total rate of complications/%
Observation group	5	4	5	20%
Control group	6	5	4	21.43%
Total	11	9	9	20.71%

Based on the data in Table 4, we also utilized SPSS 17.0 statistics software to analyze all data; the specific operating steps were as follows.

(1: the observation group, 2: the control group); use outcome to represent the occurrence of complications (1: arrhythmia, 2: heart failure, and 3: recurrent angina pectoris), and use f to represent frequency; then click the data view tag, and input the data (see Figure 4).

3.8 Data analysis

① Firstly, click the data tag in the box, and then click weighted case ; click the weighted case tag to choose weighted case, choose Frequency f as the frequency variable, and finally click OK (see Figure 5);

② Firstly, click the Analyze tag in the box, click the non-parametric test, and select 2 independent samples; after clicking the test of 2 independent samples, select the occurrence of complication outcome as the test variable, select group as the grouping variable ; then, open the Define Groups dialog box, define the minimum value as 1 and maximum value as 2 ; click Continue to return to the main dialog box, then check the Mann-Whitney U test, and finally click OK to execute analysis(see Figure 6).

3.9 Output statistical result

After executing data analysis, we obtained Table 5 and Table 6.

Based on Table 5 and Table 6, the observation group contains 14 cases in total, the rank average is 15.64, and the sum of ranks

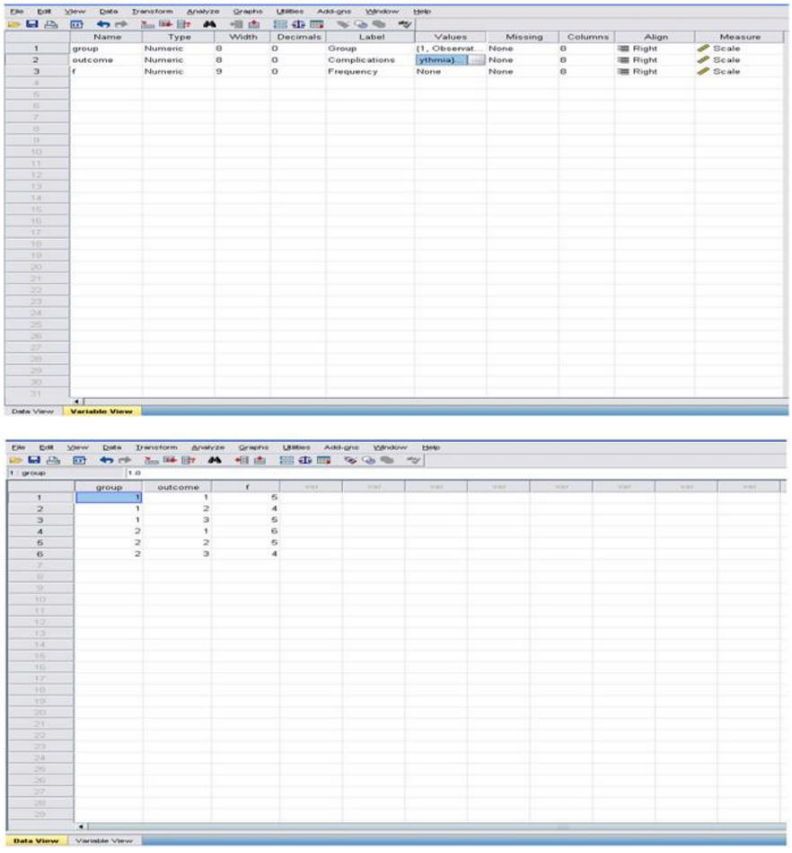

Figure 4. Define variables and input data.

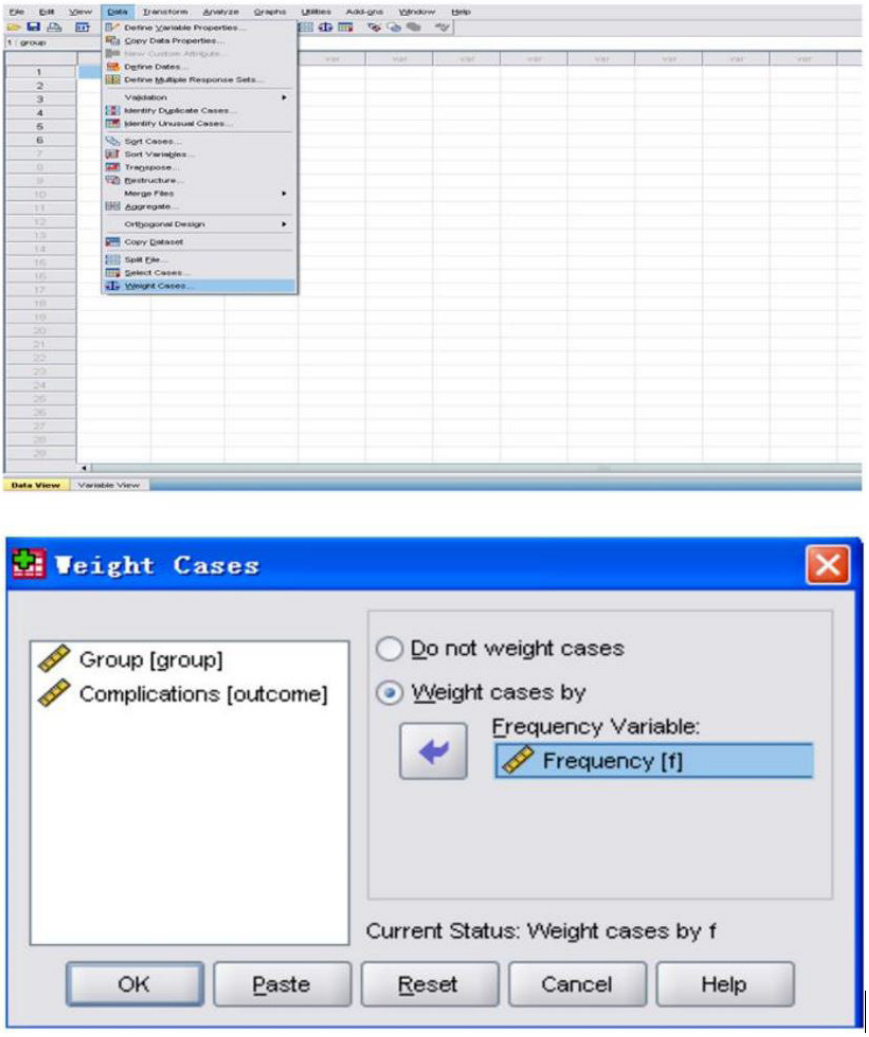

Figure 5. Selection of data weight case.

Table 5. Rank.

	Group	N	Rank average	Sum of ranks
Treatment effect	Observation group	14	15.64	219.00
	Control group	15	14.40	216.00
	Total	29		

Table 6. Test statistics [b].

	Occurrence of complications
Mann-Whitney U	96.000
Wilcoxon W	216.000
Z	-.417
Progressive significance (two-side)	.677
Precision significance [2*(one-side significance)]	.715[a]

a. No correction to the results; b. Grouping variable: group

is 219.00; the control group contains 15 cases in total, the rank average is 14.40, and the sum of ranks is 216.00. The values of test statistics Mann-Whitney U, Wilcoxon W and Z are 96.000, 216.000 and -.417 respectively; the double-side P value is 0.677, if α=0.05, then P>0.05, the differences in the treatment methods of two groups are not statistically significant.

4 Discussion

As the most common cardiovascular disease, coronary heart disease has currently become one of the main factors which cause death or disability around the world, thus earning the title of the "top killer of human". In recent years, with the development of society and economy in China, the aging of population presents an accelerating trend, people's dietary habits and lifestyles also change a lot, the mortality rate and prevalence rate of CHD increase year by year, and more and more young people begin to suffer from CHD, making CHD a main factor which seriously threatens the human health. As the medical

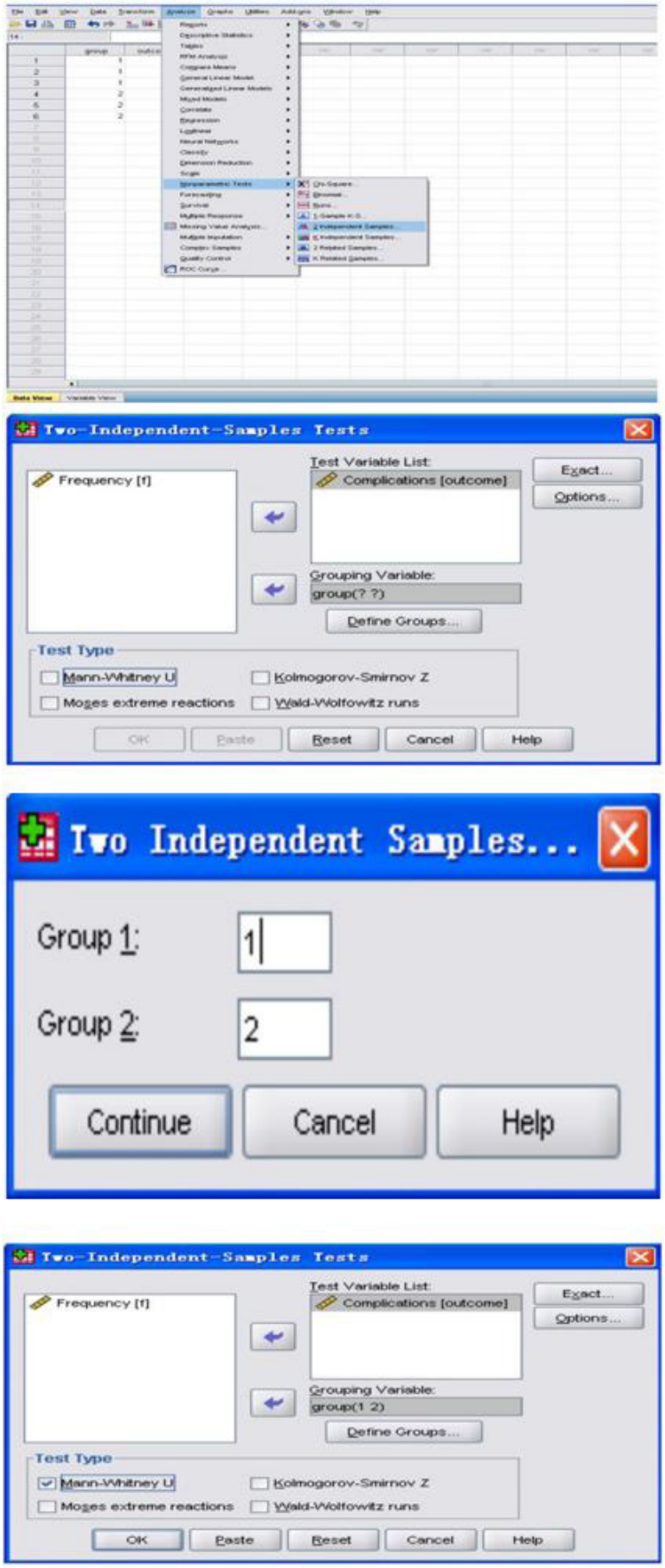

Figure 6. Rank sum test for comparison of two independent samples.

technology progresses continuously, except for drug therapy which is widely used in the clinical treatment of CHD, coronary intervention therapy also appears and has become an important treatment method for CHD. Based on the research results of this article, we find that the overall effective rate and survival rate within one year of the patients in the observation group who receive the coronary intervention therapy are obviously better than those of the patients in the control group who receive the drug therapy, while the occurrence of complication almost has no difference. The reasons for better treatment effect of coronary intervention operation than the control group include: ①the coronary intervention operation can stabilize the condition in a short time; ②the coronary intervention operation can dilate the original narrow or occlusive coronary artery lumen through cardiac catheter technology, thus improving the blood perfusion of myocardia; ③the coronary intervention operation can reconstruct the blood flow, and improve the blood supply of ischemic myocardium and hibernating myocardium, thus recovering the physiological action of myocardial cells.

The coronary intervention operation has significantly effective treatment effect, but complications such as blood vessel path complication, arrhythmia, urinary retention, contrast-induced nephropathy, and vagus reflective hypotension still exist (Zhao, 2013). Therefore, we should inform the patients and their family members of such potential situations in advance, decide whether to execute the operation according to the will of patient, and provide good preoperative, intraoperative and postoperative nursing for the patients who are willing to receive the operation. Before the operation, learn the physical conditions of the patient in detail, and give reasonable drugs to the patients; during the operation, carry out the operation in strict accordance with the operation steps, so as to minimize the risks; after the operation, periodically monitor various indices of the patients, build a clean and sanitary ward environment for the patients, pay attention to timely relieve the nervous and anxious moods of the patients, urge the patients to rest in bed, and formulate the nursing schemes for preventing vagus reflective hypotension, psychological hypotension, limb thrombus, postoperative hemorrhage and hematocele, and urinary retention (Meng & Liu, 2010). After the patient discharges from the hospital, implement proper follow-ups, and inform the patients and their family members of postoperative precautions and details, so as to reduce the postoperative adverse conditions to the minimum.

In conclusion, the treatment effect of coronary intervention therapy on CHD patients is better than that of the drug therapy, and both therapies have equivalent safety. Therefore, the treatment of coronary heart disease by coronary intervention therapy is safe and effective, and this therapy plays a crucial role in improving the living quality and survival rate of the patients and driving the clinical study on coronary heart disease.

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