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The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

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Retrospective Study

Characteristic analysis of clinical coronary heart disease and coronary artery disease concerning young and middle-aged male patients

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Abstract

BACKGROUND

Coronary heart disease (CHD) is a type of coronary atherosclerotic heart disease. In recent years, the incidence of CHD has been increasing annually, with an increasing number of young patients. Severe CHD may cause severe myocardial ischemia or myocardial necrosis, which in turn may cause myocardial infarction and related complications that seriously affect the life and health of the patient.

AIM

To examine the coronary arteries and clinical features of young and middle-aged male patients with CHD.

METHODS

From February 2019 to January 2020, 110 male CHD patients admitted to our hospital were selected as research subjects and were divided into two groups by age: middle-aged group ($n = 55$) and young group ($n = 55$). The coronary arteries and clinical features of the patients were compared.

RESULTS

There were no significant differences in dyslipidemia, stroke history, high-density lipoprotein cholesterol, or triacylglycerol ($P > 0.05$) between the two groups. In the young group, age, diabetes, hypertension, smoking history, body mass index, family history of CHD, drinking history, fibrinogen, low-density lipoprotein cholesterol, total cholesterol, and single-vessel disease were higher than those in the middle-aged group. Correspondingly, serum uric acid, hyperuricemia, myocardial infarction, Gensini score > 50 , collateral circulation, multivessel disease, double vessel disease, involvement of the right coronary artery, and involvement of the left main coronary artery were lower in the young group than

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in the middle-aged group. The middle-aged group mainly suffered from a high Gensini score, implicating multiple arteries, whereas the young group was mainly affected by single-vessel disease. The between-group difference was significant ($P < 0.05$).

CONCLUSION

In CHD attacks, multiple coronary arteries are implicated in middle-aged male patients and single-vessel disease in young male patients.

Key Words: Coronary heart disease; Coronary artery disease; Coronary artery features; Myocardial ischemia; Risk factors

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Core Tip: Retrospective studies have confirmed the involvement of multiple coronary arteries in the onset of coronary heart disease (CHD) in middle-aged and elderly male patients and in single-vessel disease in young male patients. This study included 110 male CHD patients as research cases to examine the coronary arteries and clinical features of young and middle-aged male CHD patients.

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INTRODUCTION

Coronary heart disease (CHD) is a type of coronary atherosclerotic heart disease. Due to pressure exerted at work, irregular daily schedules and diets, accelerated pace of life, and other factors, the incidence of CHD increases annually and is more prevalent in younger people[1-7]. In more severe cases, coronary artery stenosis or occlusion occurs, and the myocardial blood supply continuously decreases and can even terminate. This can result in severe myocardial ischemia or myocardial necrosis that leads to myocardial infarction and related complications, which have a serious impact on the life and health of patients[8,9]. As CHD tends to occur in younger people, the after-illness impact on reduced quality of life, labor loss, and prognosis in young patients is far greater than those on middle-aged patients. The clinical features and risk factors of young patients after onset have been characterized[10].

This study aimed to examine the coronary arteries and clinical features of young and middle-aged male CHD patients.

MATERIALS AND METHODS

Clinical data

A total of 110 male CHD patients admitted in our hospital from February 2019 to January 2020 were included and then evenly divided into two groups according to age: middle-aged group (55 patients) and young group (55 patients). The inclusion criteria were as follows: CHD patients diagnosed by coronary arteriography (there was more than one coronary artery with $> 50\%$ diameter reduction through coronary arteriography, and a clinical diagnosis of myocardial infarction); first-episode patient; patient had complete general data; and the patient understood the whole process of the research and had signed an informed consent form. The exclusion criteria were as follows: patients with malignant tumors or immune system diseases; patients suffering from polyarteritis, CHD, and congenital coronary artery malformation; and patients suffering from aortic dissection, acute pericarditis, cardiomyopathy, myocarditis, and malformed pulmonary embolism. The patients' ages ranged from 33 to 77 (60.63 ±

5.48) years. The research was approved by the Ethics Committee.

Method

Applied coronary arteriography was performed on all patients. The patients' basic clinical data, including past medical history, age, coronary arteriography results, and so forth, was collected.

Observational index

A comparative observation of the clinical data, coronary artery lesion features, and related blood lipid index factors was carried out. Clinical data included age, diabetes, hypertension, smoking history, body mass index, family history of CHD, hyperuricemia, dyslipidemia, myocardial infarction, drinking history, and stroke history. The number of vascular involvements included multivessel disease, double vessel disease, and single-vessel disease (SVD), and the site of vascular involvement included the right coronary artery and left main coronary artery, evaluating the stenosis degree of vascular disease by means of the Gensini score system. The AU5800 fully automatic biochemical analyzer was used to detect related blood lipid indices, including serum uric acid, fibrinogen, high-density lipoprotein cholesterol, low-density lipoprotein cholesterol, triacylglycerol, and total cholesterol.

Data processing

The collected survey data were processed and analyzed using SPSS 22.0. The mean \pm SD was used to describe blood lipid related index factors in patients, which were analyzed with the Student's *t*-test. Basic clinical data were described using number (%) and then analyzed with the χ^2 test. A $P < 0.05$ indicated that the research data was significant.

RESULTS

Analysis of the basic clinical data between the patient groups

The between-group dyslipidemia and stroke history differences were not statistically significant ($P > 0.05$). In the young group, age, diabetes, hypertension, smoking history, body mass index, family history of CHD, and drinking history were higher than in the middle-aged group. In addition, the incidence of hyperuricemia and myocardial infarction were lower in the young group than in the middle-aged group. The between-group data difference was found to be statistically significant ($P < 0.05$), as shown in [Table 1](#).

Analysis of coronary artery lesion characteristics between the patient groups

When the Gensini score was over 50, the middle-aged group collateral circulation, multivessel disease, double vessel disease, and involvement of the right coronary artery and left main coronary artery were higher than in the young group. In addition, the SVD in the middle-aged group was lower than in the young group. The between-group difference was found to be statistically significant ($P < 0.05$), as shown in [Table 2](#).

Factor analysis of blood lipid related index between the patient groups

The between-group patient high-density lipoprotein cholesterol and triacylglycerol differences were not statistically significant ($P > 0.05$). The young group fibrinogen, low-density lipoprotein cholesterol, and total cholesterol levels were higher than those of the middle-aged group. Furthermore, the young group serum uric acid level was lower than the middle-aged group. The between-group data difference was statistically significant ($P < 0.05$), as shown in [Table 3](#).

DISCUSSION

CHD is a common disease caused by functional and organic stenosis of the coronary arteries, resulting in decreased oxygenated blood in the heart[11]. CHD occurrence and development are closely related to daily life habits, individual differences in patients, and so on[12-17]. Along with plaque accumulation in the coronary arteries, coronary arteries in CHD patients are narrow, which easily causes angina and other complications. In addition, acute anterior cardiac pain commonly occurs in CHD and

Table 1 Analysis of the basic clinical data in between-group patients, mean \pm SD or *n* (%)

Factor	Young group, <i>n</i> = 55	Middle-aged group, <i>n</i> = 55	<i>t</i> / <i>X</i> ²	<i>P</i> value
Age	36.12 \pm 4.25	71.36 \pm 5.43	37.9012	0.0000
Diabetes	8 (14.54)	35 (63.63)	27.8341	0.0000
Hypertension	9 (16.36)	39 (70.90)	33.2661	0.0000
Smoking history	20 (36.36)	31 (56.36)	4.4234	0.0354
BMI in kg/m ²	27.35 \pm 3.33	25.08 \pm 2.19	4.2238	0.0001
Family history of CHD	4 (7.27)	12 (21.81)	4.6809	0.0305
Hyperuricemia	3 (5.45)	23 (41.8)	20.1465	0.0000
Dyslipidemia	20 (36.36)	22 (40.00)	0.1541	0.6946
Myocardial infarction	17 (30.90)	30 (54.54)	6.2783	0.0122
Drinking history	19 (34.54)	7 (12.72)	7.2527	0.0070
Stroke history	2 (3.63)	6 (10.90)	2.1569	0.1419

CHD: Coronary heart disease; BMI: Body mass index.

Table 2 Analysis of coronary artery lesion characteristics in between-group patients, *n* (%)

Group	Gensini score > 50	Collateral circulation	MVD	DVD	SVD	Right coronary artery	Left main coronary artery
Young, <i>n</i> = 55	10 (18.18)	11 (20.00)	6 (10.90)	8 (14.54)	17 (30.90)	10 (18.18)	2 (3.63)
Middle-aged, <i>n</i> = 55	24 (43.63)	23 (41.81)	19 (34.54)	17 (30.90)	7 (12.72)	22 (40.00)	8 (14.54)
<i>X</i> ²	8.3437	6.1300	8.7482	4.1929	5.3295	6.3462	3.9600
<i>P</i> value	0.0038	0.0132	0.0030	0.0405	0.0209	0.0117	0.0465

MVD: Multivessel disease; DVD: Double vessel disease; SVD: Single vessel disease.

Table 3 Factor analysis of blood lipid related index in between-group patients (mean \pm SD)

Group	Serum uric acid, μ mol/L	Fibrinogen, g/L	HDL-C, mmol/L	LDL-C, mmol/L	Triacylglycerol, mmol/L	Total cholesterol, mmol/L
Young, <i>n</i> = 55	285 \pm 17	3.22 \pm 0.95	1.12 \pm 0.36	2.81 \pm 0.46	2.13 \pm 0.66	4.60 \pm 0.57
Middle-aged, <i>n</i> = 55	386 \pm 19	2.75 \pm 0.71	1.02 \pm 0.35	2.41 \pm 0.23	1.97 \pm 0.53	4.13 \pm 0.41
<i>X</i> ²	29.3796	2.9389	1.4770	5.7680	1.4018	4.9642
<i>P</i> value	0.0000	0.0040	0.1426	0.0000	0.1638	0.0000

HDL-C: High-density lipoprotein cholesterol; LDL-C: Low-density lipoprotein cholesterol.

angina patients, which result in myocardial infarction if not treated in a timely manner, seriously threatening the life and health of the patient. CHD is the most common cardiovascular disease causing disability or death[18-20]. The prevalence of CHD is currently trending toward younger individuals.

Young CHD patients are aged under 44 years and have myocardial damage triggered by the reduced blood supply to the myocardium caused by coronary artery occlusion or stenosis due to various factors. Compared to elderly patients, young patients have a certain degree of variability in their coronary arteries. This research showed that there were no significant differences between the patient groups with

respect to dyslipidemia and stroke history ($P > 0.05$); in the middle-aged group, age, diabetes, hypertension, smoking history, body mass index, family history of CHD, and drinking history were lower than in the young group. The middle-aged group's hyperuricemia and myocardial infarction were significantly lower than in the young group, and the between-group data difference was statistically significant ($P < 0.05$). Moreover, there were no significant differences in the high-density lipoprotein cholesterol and triacylglycerol levels in the young and middle-aged groups ($P > 0.05$). Fibrinogen, low-density lipoprotein cholesterol, and total cholesterol were higher in the young group than in the middle-aged group, and serum uric acid was lower in the young group than in the middle-aged group. The between-group data difference was statistically significant ($P < 0.05$).

When the Gensini score was over 50, the middle-aged group's collateral circulation, multivessel disease, double vessel disease, and involvement of the right coronary artery and left main coronary artery were higher than in the young group. Furthermore, the middle-aged group's SVD was lower; the difference between the groups was statistically significant ($P < 0.05$).

The middle-aged group's collateral circulation was higher than the young group because of the slower onset in the middle-aged group as well as the longer course of disease. The younger group had a shorter course of disease and a lack of build-up time for collateral circulation. This can be reasonably explained by the fact that middle-aged patients have a greater proportion of angina. However, morbidity of young patients is focused on myocardial infarction.

CONCLUSION

In conclusion, the morbidity of middle-aged male CHD patients involves multiple coronary arteries. In addition, young CHD patients are mostly focused on SVD with more risk factors.

ARTICLE HIGHLIGHTS

Research background

Coronary heart disease (CHD) is a type of coronary atherosclerotic heart disease. In recent years, the incidence of CHD has increased annually, and the age of onset has gradually decreased. Severe CHD may cause severe myocardial ischemia or myocardial necrosis, which in turn may cause myocardial infarction and related complications, with serious consequences.

Research motivation

Because CHD occurs in young people, the impact on the quality of life of young patients after the disease, labor loss, and prognosis are much greater than that of middle-aged patients. The clinical features and risk factors of young patients have been characterized, and we hope to explore this.

Research objectives

This study aimed to analyze the clinical characteristics of coronary artery disease in young and middle-aged men with CHD.

Research methods

A total of 110 male CHD patients were selected as research subjects and then divided into two groups by age: a middle-aged group ($n = 55$) and a young group ($n = 55$). The coronary arteries and clinical features of the patients were compared.

Research results

In the young group, age, diabetes, hypertension, smoking history, body mass index, family history of CHD, drinking history, fibrinogen, low-density lipoprotein cholesterol, total cholesterol, and single-vessel disease (SVD) were higher in the young group than in the middle-aged group. The middle-aged group mainly suffered from a high Gensini score, implicating multiple arteries, whereas the young group was mainly affected by SVD. The between-group differences were significant.

Research conclusions

In CHD attacks, multiple coronary arteries are implicated in middle-aged male patients, whereas SVD is implicated in young male patients.

Research perspectives

In middle-aged and elderly male patients, multiple coronary arteries are involved in CHD attacks, while in young male patients it is associated with SVD, which has certain hints for subsequent clinical diagnosis and treatment.

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