Research Article

Features of Atherosclerotic Lesions of Coronary Arteries in Patients with Different Functional Classes of Stable Angina Pectoris

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Abstract

Purpose: The aim of the study was to evaluate the degree of coronary artery lesions in different functional classes of stable angina pectoris.

Materials and methods: The study involved 64 patients with a diagnosis of coronary heart disease stable angina pectoris. To study coronary blood flow, all patients underwent coronary angiography.

Results: Among patients of functional group I, lesions of the right coronary artery were relatively rare compared to other groups. When comparing coronary angiography data in patients with a diagnosis of stable angina pectoris I, II and III FC, lesions of the anterior intraventricular network and other branches of the left coronary artery were more common than injuries of the right coronary artery and other branches.

Conclusion: It was reliably noted that the anterior intraventricular network of the left coronary artery was significantly more damaged among patients of group II FC. The defeat of the posterior lateral network was significantly more frequent in patients of the II group of FC than in patients of the I and III groups. There was no significant difference between the groups for right coronary artery injury.

Keywords: Coronary heart disease; Stable angina pectoris; Coronary angiography; Coronary insufficiency index

Introduction

Cardiovascular diseases are currently the leading cause of morbidity, mortality and disability worldwide [1-4]. According to the WHO, about 1.7 million people die annually from cardiovascular diseases and their complications. Coronary Heart Disease (CHD) is a disease caused by complete or partial obstruction of coronary arteries, mainly due to atherosclerosis. According to the WHO, the incidence of coronary heart disease among the world population is 2% to 5% in men aged 45 to 54 years, 10% to 20% among 65 to 74 years old; in women it is 0.1% to 1% among 45 to 54 years old and 10% to 15% among 65 to 74 years old, respectively. Mortality from coronary heart disease is 30% [1]. In 2014, mortality from diseases of the cardiovascular system in the Russian Federation amounted to 52.9% of the total number of deaths [3]. Lethal complications of diseases of the cardiovascular system are observed mainly in people of working age. For example, the majority of deaths from cardiovascular diseases were registered among able-bodied men (31.3%) and women (23.9%) [3]. Atherosclerotic coronary artery disease is considered as a pathological process that causes an imbalance between oxygen demand and heart supply, as well as leading to ischemic myocardial hypoxia as metabolic disorders [5,6]. Analysis of the results of many large studies confirmed the presence of a link between narrowing of the coronary arteries due to atherosclerotic lesions and myocardial ischemia, and this link is also important for the development and prognosis of the disease [7-10]. Coronary angiography is the "golden standard" among the methods of determining the degree of coronary artery disease. Koryakov et al. [5] and according to the co-authors of the series, coronary angiography in patients with different functional classes of stable angina pectoris are very rare lesions of coronary vessels in patients with functional class I, the anterior intraventricular network of the left coronary artery is more reliably damaged in patients of functional class III, and lesion of the right coronary artery is relatively rare in all groups in accordance with the pathological process, lesions of the posterior ventricular network are relatively reliable only in patients with functional class II [5].

Aim of the study

Comparative analysis of the degree of coronary artery lesions between different functional classes of stable angina pectoris.

Materials and Methods

The study involved 64 patients with a diagnosis of coronary heart disease stable angina pectoris, hospitalized and treated at the Republican specialized scientific and practical medical center for therapy and medical rehabilitation in 2019-2022 and underwent coronary angiography procedure. The diagnosis of stable angina pectoris was established on the basis of patient complaints, medical history, physical examination, laboratory and instrumental studies, following the "Guidelines on Chronic Coronary Syndromes" adopted by the European Society of Cardiology in 2019. According to the results of clinical, laboratory and instrumental examination, the

patients were divided into 3 groups:1st group-12 patients (4 men and 8 women; mean age 58.4 ± 1.05 years) with stable angina pectoris FC I; 2nd group-30 people (18 men and 12 women mean age 62.03 ± 2.7 years) with stable angina pectoris FC II; 3rd group included 22 patients (11 men and 11 women, mean age 69.7 ± 1.8 years) with a diagnosis of stable angina pectoris FC III (Table 1).

Table 1: Characteristics of the studied groups.

Groups	Diagnosis	Number of patients	Average age of patients (years)
I group	Stable angina pectoris FC I	12	58.4 ± 1.05
II group	Stable angina pectoris FC II	30	62.03 ± 2.7
III group	Stable angina pectoris FC III	22	69.7 ± 1.8

Exclusion criteria

Presence of acute cerebrovascular disorders, autoimmune diseases and diffuse connective tissue diseases, acute and chronic inflammatory conditions, cancer, mental illness and other serious diseases.

The data collected during the study was processed using IBM SPSS Statistics 17.0. The arithmetic mean and standard deviations (M+m) of all indicators were calculated. The reliability of differences in quantitative indicators between groups was determined by the student's criterion, differences in qualitative indicators-by the Xi2 criterion. The differences between the groups were significant at $p < 0.05$.

Results

Among patients of functional group I, lesions of the right coronary artery were relatively rare compared to other groups (14.06%; $p<0.05$) (Figure 1). It was noted that the anterior intraventricular septum branch of the left coronary artery was damaged more in patients in functional group II (21.9%; $p <0.05$) (Figure 2). Lesions of the left circumflex artery were found in 24.7% and 22.4% of patients in functional groups II and III, respectively ($p <0.05$).

Posterior lateral lesions were recorded in 17.7% of patients in functional group II. Lesions of the right coronary artery occurred in 2.3%, 12.5% and 13.7% of patients of the I, II and III groups respectively.

Damage to the posterior intraventricular artery was found only in 16.7% of patients in functional group III ($p <0.05$). When comparing coronary angiography data in patients with a diagnosis of stable angina pectoris I, II and III FC, lesions of the anterior intraventricular network and other branches of the left coronary artery were more common than injuries of the right coronary artery and other branches (Figure 3).

Discussion

Koryakov et al. [5], coronary angiography in patients with various functional classes of stable angina pectoris showed a very low incidence of right coronary artery disease in functional group I patients, the anterior intraventricular septum of the left coronary artery was reliable more damaged in patients in functional group III, damage to the right coronary artery was found relatively rare in all groups in accordance with the pathological process, while damage to the posterior intraventricular network is relatively common only in patients of functional group II [5]. Our analysis showed that the involvement of coronary arteries in general was rare in patients in
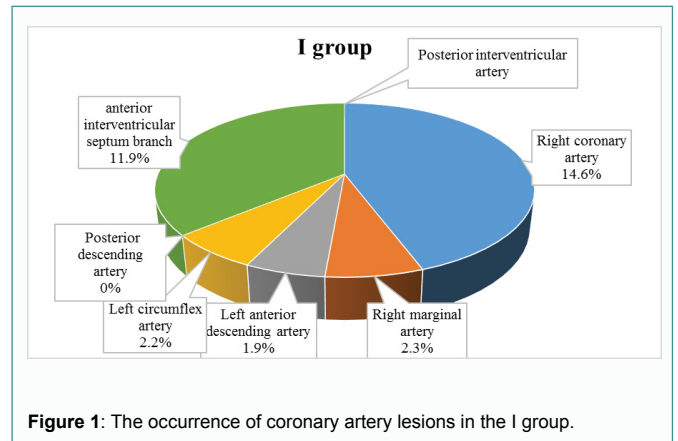
Figure 1: The occurrence of coronary artery lesions in the I group.
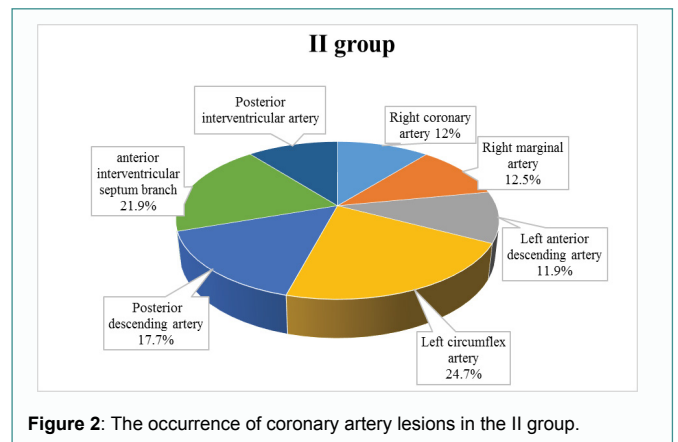
Figure 2: The occurrence of coronary artery lesions in the II group.
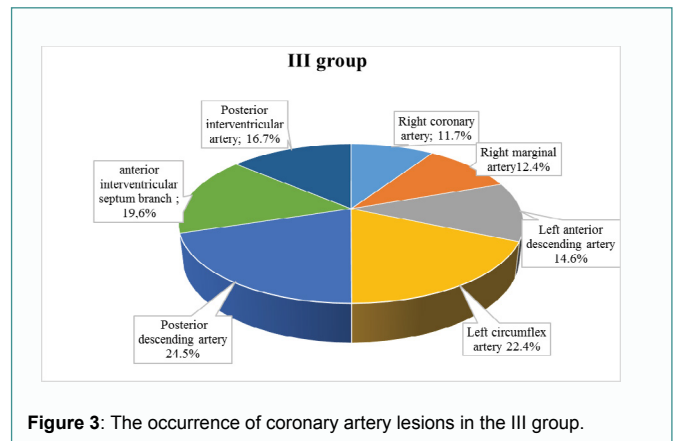
Figure 3: The occurrence of coronary artery lesions in the III group.

functional group I, and that of the right coronary artery was relatively rare in all groups. In our study, the anterior intraventricular network of the left coronary artery was significantly more susceptible to damage in patients of functional group II, and damage to the posterior ventricular network was more common in patients only in functional group III.

Conclusion

- It was reliably noted that the anterior intraventricular network of the left coronary artery was significantly more damaged among patients of group II FC.

- The defeat of the posterior lateral network was significantly more frequent in patients of the 2nd group of FC than in

patients of the 1st and 3rd groups.

- There was no significant difference between the groups for right coronary artery injury.

- Damage to the anterior intraventricular network and other branches emerging from the left coronary artery was noted to be greater than damage to the right coronary artery and its branches.

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