The Effect of Risk Factors on Cardiovascular Diseases in Thi-Qar Governorate

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Abstract. The purpose of this research was to identify the role of risk variables in the onset and progression of cardiovascular illnesses. There was a significant difference (P ≤0.05) between the two groups, with the sick group having a 36% higher smoking rate than the control group's 12% rate. A comparison between the patient group and the control group revealed that total cholesterol, triglycerides, and low-density lipoprotein (LDL) concentrations were all higher in the former, while HDL concentrations were lower. With 64% of patients experiencing hypertension and 36% not experiencing it, the percentages of patients with hypertension and those without it are much greater. There was a greater prevalence of type 2 diabetes among patients (60% vs. 40%), as well as other metabolic disorders. Among the other findings, 38% of patients were considered to be at a normal weight, 40% were considered to be overweight, and 24% were classified as having first-class obesity

Highlights:

1. Higher smoking rate, cholesterol, LDL, and lower HDL in patients.
2. Increased hypertension (64%) and type 2 diabetes (60%) prevalence.
3. 40% overweight, 24% obese, 38% normal weight among patients.

Keywords: Heart and Vascular diseases, Rask Factors.

Introduction

Reports from the World Health Organization (WHO) indicate that cardiovascular diseases (CVD) account for 32% of all fatalities globally, with an estimated yearly mortality rate of 17.9 million persons [1]. Ilnesses affecting the heart and blood arteries are collectively known as cardiovascular illnesses, according to the World Health Organization (WHO) [2]. Heart failure (HF), atherosclerosis (CHD), angina pectoris (AP), myocardial infarction (MI), and coronary heart disease (CHD) are the most significant types of cardiovascular illnesses. The lack of oxygen and nutrients that the heart needs to function properly is what causes these disorders, which manifest as constriction or blocking of the arteries [3]. Cardiovascular disease risk factors may be mitigated via adherence to a nutritious diet, abstention from smoking, regular physical activity, and the avoidance of foods rich in salt and fat. These include hypertension, obesity, diabetes

mellitus, total cholesterol, low-density lipoprotein, triglycerides, and tobacco use. Factors such as gender, age, familial history, and environmental influences are regarded as non-modifiable risk factors [4].

Arteriosclerosis is a disorder characterized by the buildup of lipids, cholesterol, and other substances on arterial walls, resulting in plaque formation that causes arterial constriction or obstruction, ultimately leading to atherosclerosis [5]. Angina pectoris arises from insufficient blood flow to the cardiac muscle, caused by obstruction of the coronary arteries that feed the whole heart. Angina pectoris is categorized into three types: stable angina, unstable angina, and variant angina [6]. Myocardial infarction, commonly referred to as a heart attack (HA), is a form of acute coronary syndrome characterized by the necrosis, damage, and functional impairment of a specific region of the heart, resulting from a significant reduction in blood flow due to the occlusion of the coronary artery supplying that region by a thrombus [7]. The clot entirely obstructs the artery, hence hindering blood flow to that region. Heart failure, or congestive heart failure, is a disorder characterized by the heart muscle's inability to adequately pump blood and oxygen throughout the body [8].

Research Gap

Although many studies have indicated the effect of basic risk factors on cardiovascular diseases, there are other studies that have indicated the effect of other factors on cardiovascular diseases, including genetic factors. Therefore, more molecular studies must be conducted to determine the effect of genetic polymorphism on cardiovascular diseases

Methods
Samples collection

The research included 75 blood samples, consisting of 50 samples from individuals with cardiovascular problems sourced from the Heart Hospital in Thi-Qar Governorate, and 25 samples from healthy individuals serving as a control group, collected from 12/1/2023 to 4/1/2024 for both genders. An information collecting form was implemented for both patient groups and healthy individuals, and the samples were preserved in laboratory tubes suitable for each evaluation. Where a full blood count (CBC) and enzyme-linked immunosorbent assay (ELISA) are conducted.

Statistical Analysis

The data was subjected to statistical analysis using SPSS version 23.0. Data are expressed as the mean ± standard deviation (SD). The T-test and chi-square test were used as well.

Result and Discussion
The effect of smoking

The present investigation indicated that the sick group had 32 smokers, accounting for 64%, which is much higher than the healthy group, which had 3 smokers, representing 12%. In the comparison of smoking patients, totaling 32 individuals (64%), against non-smoking patients, numbering 18 (36%), the smoking cohort exhibited both a greater quantity and percentage than the non-smoking group. Additionally, the results indicated statistically significant differences (P value ≤0.05).

Table (1): Distribution of patients and healthy individuals according to smoking status

Smoking	Patients	Control	p. value
Non smoker	(%36) 18	(88%) 22	0.029
Smoker	(%64) 32	(12%) 3	
Total	(%100) 50	(%100) 25	
*P. value ≤ 0.05		Df =	

Cholesterol, triglycerides, HDL and LDL levels

The present research demonstrated a notable elevation in the levels of cholesterol, triglycerides, and low-density lipoprotein in cardiac patients relative to the control group, but the levels of high-density lipoprotein decreased in cardiac patients compared to the control group.

Table (2): Comparison of cholesterol, triglycerides, high-density lipoprotein and low-density lipoprotein levels in patients and healthy controls.

Parameter	Patients (SD±Mean)	Control (SD±Mean)	t. value	p. value
Cholesterol	37.14 ± 212.78	11.92 ± 134.72	10.21	<0.0001*
Triglycerides	49.01 ± 190.76	16.72 ± 113.16	5.68	<0.0001*
HDL	6.79 ± 43.38	7.73 ± 57.64	-8.17	<0.0001*
LDL	23.41 ± 149.40	19.59 ± 77.78	12.33	<0.0001*

The effect of Diabetes and hypertension.

The present findings indicate that the majority of cardiac patients do not have diabetes (60%), while the proportion of those with diabetes is 40%, with no significant differences at a significance level (P. value < 0.05). The prevalence of hypertension was 64%, whereas the proportion of individuals without high blood pressure was 36%, with significant differences seen at a significance threshold of P. value < 0.05.

Table (3): The relationship between heart disease diabetes and hypertension.

Chronic diseases	diabetes	hypertension
Yes	(%40) 20	(%64) 32
No	(%60) 30	(%36))18
Total	(%100) 50	(%100) 50
p. value	0.157	0.048
CalX^2	2.00	3.92
df	1	1

The effect of body mass index

The findings of the present research indicated that the majority of cardiac patients were overweight at 40%, followed by those with a normal body mass at 36%, while the lowest proportion was seen in patients with type 1 obesity at 24%. The present analysis revealed no significant changes at a significance level (P.value < 0.05).

Table (4): The relationship between heart disease and body mass index

Patients	body mass index
(%36) 18	normal weight
(%40) 20	overweight
(%24) 12	Class 1 obesity
(%100) 50	Total
0.353	p.value
Df=2	

Discussion

The study of Holt et al. [9] shown that smoking is a significant risk factor for cardiovascular disease and a leading cause of mortality globally. A study performed by Karimi Jaberi et al. [10] demonstrated that smoking directly contributes to cardiovascular disease via many mechanisms. It damages the endothelium lining of blood arteries, which is the primary initiation point for atherosclerosis. Smoking exerts toxic effects that induce alterations in endothelial cells. Smoking enhances the adhesion of white blood cells and platelets and influences the growth of smooth muscle by releasing several chemicals, including nitric oxide (NO).

This study's results corroborate those of past research that have linked obesity to an increased risk of cardiovascular disease. High levels of low-density lipoprotein (LDL) are associated with an increased risk of coronary heart disease, according to the findings of Jung et al. [11], who also found that total cholesterol, triglycerides, and LDL all contribute significantly to the risk of atherosclerosis and other cardiovascular illnesses. Furthermore, Kartiosuo et al. [12] shown that atherosclerosis-induced increases in triglyceride levels, especially in conjunction with reduced HDL levels, may provide protection against cardiovascular disease.

Numerous studies demonstrate that diabetes significantly increases the risk of cardiovascular disease. Grossman and Messerli. [13] demonstrated that diabetes is linked to an increased prevalence of coronary artery disease and heart failure, underscoring the significant correlation between these illnesses. The research identified a correlation between blood pressure and cardiovascular disease. This result aligns with other research identifying hypertension as a significant risk factor for cardiovascular

disease development. Numerous studies indicate that elevated blood pressure levels correlate with a heightened risk of cardiovascular disease, as shown by study of [14]. Nevertheless, the study of Wu et al. [15] also discovered that the association between diabetes and heart disease may differ according to characteristics like as age, gender, and the existence of other comorbidities.

The present study's findings indicate that obesity is a significant risk factor for cardiovascular illnesses. Research done by Futter et al. [16] has shown that obesity is a critical risk factor for heart disease, with overweight persons often experiencing worse outcomes than those of normal weight. The study of Oreopoulos et al. [17] shown that obesity has a substantial role in the progression of atherosclerosis and myocardial infarction

Conclusion

The present investigation demonstrated the impact of smoking, hypertension, and diabetes on cardiovascular illnesses. The findings revealed that cholesterol, triglyceride, and low-density lipoprotein levels were elevated in the patient group relative to the control group, signifying their status as significant risk factors for cardiovascular illnesses.

Conflicts of Interest

The authors declare no conflict of interest.

Acknowledgment

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