

Multimed 2025; 29: e2921

Original article

Risk factors associated with ischemic heart disease in the Vista Alegre community council

Risk factors associated with ischemic heart disease in the popular council of Vista Alegre

Risk factors associated with ischemic heart disease in the Vista Alegre popular council

Geovanny Machado Mendez I*  <https://orcid.org/0009-0007-5184-8190>

Ana Julia Quezada Font I  <https://orcid.org/0000-0001-6765-0532>

Deilis Pérez Martínez I  <https://orcid.org/0000-0003-0435-7907>

Ana Mirtha Guzmán Ortiz I  <https://orcid.org/0009-0008-5298-4634>

Carlos Mario Morales García I  <https://orcid.org/0000-0001-9575-2667>

^{Yo}Granma University of Medical Sciences. Provincial Center for Hygiene and Epidemiology. Bayamo. Granma, Cuba.

* Corresponding author. Email: geovanismh@infomed.sld.cu

SUMMARY

Introduction: Ischemic heart disease is the top 10 cause of death in Cuba.

Aim: determine the risk factors associated with ischemic heart disease.

Methods: An analytical observational study of cases and controls was carried out with a 1:2 ratio, thus the sample was represented by 167 cases and 334 controls.

Results: The female sex represented 62.9% of the cases and the 65-year age group with 54.4% showed the highest frequency. The medical practice with the highest prevalence rate was Pueblo Nuevo I, with 5.6 per 100,000 inhabitants. The risk factors with the highest degree of association and attribution



This work by Multimed is licensed under a
<https://creativecommons.org/licenses/by-nc-sa/4.0/>

were, in decreasing order, high blood pressure (odds ratio: 5.9); smoking (odds ratio: 4.3); and diabetes (odds ratio: 1.0).mellitus odd ratio 3.8.

Conclusions:High blood pressure, smoking, diabetes mellitus, family history of heart disease, dyslipidemia, alcoholism, and sedentary lifestyle were the classic risk factors for cardiovascular disease associated with ischemic heart disease in the area studied, demonstrating that there is solid scientific evidence of their causal association.

Keywords Risk factors; Causality; Probabilities.

SUMMARY

Introduction: Ischemic heart disease ranks first among the top 10 causes of death in Cuba.

Objective: To determine the risk factors associated with ischemic heart disease.

Methods: An analytical observational study of cases and controls was carried out with a 1:2 ratio, in this way the sample was represented by 167 cases and 334 controls.

Results: Females accounted for 62.9 % of the cases, and the 65-year-old age group with 54.4 % showed the highest frequency. The medical office with the highest prevalence rate was that of Pueblo Nuevo I with 5.6 per 100,000 inhabitants. The risk factors with the highest degree of associated and attribution were, in descending order, arterial hypertension with an odd ratio of 5.9. Smoking moodds ratio 4.3. Diabetes mellitus odds ratio 3.8.

Conclusions: arterial hypertension, smoking, diabetes mellitus, family history of heart disease, dyslipidemia, alcoholism and sedentary lifestyle were the classic risk factors for cardiovascular disease, associated with ischemic heart disease in the territory under study, which demonstrates that there is solid scientific evidence of its causal association.

Keywords: Risk factors; Causality; Probabilities.

SUMMARY

Introduction: Ischemic heart disease occupies first place among the 10 main causes of death in Cuba.



Aim: Determine the risk factors associated with ischemic heart disease.

Methods: An analytical observational study of cases and controls was carried out with a proportion of 1:2, so the sample was represented by 167 cases and 334 controls.

Results: The female sex represented 62.9% of the cases, and that at the age of 65, 54.4% occurred more frequently. The medical office with the highest prevalence was in Pueblo Nuevo I, with 5.6 per 100,000 inhabitants. The risk factors with a greater degree of association and attribution foram, in descending order, to arterial hypertension, with an odds ratio of 5.9. Ratio of chances of tobacco addiction 4.3. Odds ratio of diabetes mellitus 3.8.

Conclusões: high blood pressure, smoking, diabetes mellitus, family history of heart disease, dyslipidemia, alcoholism and sedentary lifestyle for the classical risk factors for cardiovascular disease, associated with ischemic heart disease in the territory of the study, which demonstrates that there is solid scientific evidence of its association causal.

Keywords: Cliff factors; Causality; Odds.

Received: 10/29/2024

Approved: 09/23/2025

Introduction

Cardiovascular diseases constitute a serious public health problem. According to the World Health Organization (WHO), represents. The leading cause of death and disability worldwide, they are responsible for one-third of all deaths and half of all deaths from non-communicable diseases. Annual deaths from cardiovascular diseases are predicted to increase from 17.1 million in 2004 to 23.4 million in 2030. (1)



This work by Multimед is licensed under a
<https://creativecommons.org/licenses/by-nc-sa/4.0/>

Coronary heart disease is preventable in its entirety, as are the negative impacts once it develops. Many deaths are avoidable with early intervention, and most patients who survive the critical phase can return to their normal lives. (2)

Among these risk factors (RF) mostly identified in heart disease are the non-modifiable ones (genetic inheritance, age, sex) and modifiable ones (hypercholesterolemia, high blood pressure, diabetes mellitus, smoking, obesity, sedentary lifestyle and alcoholism). (3)

The presence of the main risk factors does not mean that one will suffer from coronary heart disease, but it is true that the greater the number of risk factors, the greater the likelihood of becoming ill. In this case, the future depends largely on the individual and their decision, will, and perseverance to change their lifestyle. (2,3)

Cardiovascular diseases caused 2,705 deaths in Havana alone in 2021, with a mortality rate of 476.6 per 100,000 inhabitants. In Granma, it has been the leading cause of death in recent years, with a gross population rate of 340.7 per 100,000 inhabitants in that period, compared to 251.6 per 100,000 inhabitants in the previous year. The increase of 35.4% is significant and the trend is upward for the coming years. (4)

In the municipality of Media Luna, a total of 388 deaths occurred in 2021, of which 110 were due to cardiovascular causes, representing 28.4% of the deaths, a rate of 339.7 per 100,000 inhabitants, and a fatality rate of 21.5. Within the municipality, Popular Council 06 of Vista Alegre had the highest mortality rate from this cause, with 470.0 per 100,000 inhabitants, and a fatality rate of 20.3.

Methods



An analytical observational case-control study was conducted with 501 patients belonging to the family doctor's offices of the Vista Alegre Popular Council 06 of the Raúl Podio Saborit teaching polyclinic, Media Luna, from January 1, 2021, to December 31 of the same year.

The universe consisted of 7,102 patients belonging to the seven medical offices that make up said popular council 06 during 2021.

The sample size for case-control studies was determined Using stratified probability sampling, the study ultimately consisted of 167 case patients (patients diagnosed with the disease under study). Two controls (people who did not present with ischemic heart disease during the study) were selected in pairs for each case. Thus, 334 controls were investigated according to the pairing method used, for a total of 501 people.

Definition of cases and controls

Inclusion criteria for cases: patients over 18 years of age, diagnosed with ischemic heart disease in its various clinical presentations (cardiac arrest, angina pectoris, acute myocardial infarction, heart failure, arrhythmias), who belong to the Vista Alegre People's Council and who expressed their willingness to participate in the research.

Exclusion criteria for cases: other clinical form of cardiovascular disease.

Inclusion criteria for controls: no evidence of ischemic heart disease.

Exclusion criteria for controls: detection of symptoms and signs of the disease under study. Change of address outside the council.

Exit criteria: death before data collection.

Operationalization of variables

Dependent variable. Ischemic heart disease, nominal dichotomous qualitative variable (present 1/absent 2).

Independent variables:

Age, discrete quantitative variable, in years completed.



Sex, nominal dichotomous qualitative variable (male/female).

Family history (inheritance): present (exposed) 1 / absent (not exposed) 2,

smoking habit (Smoking), nominal dichotomous qualitative variable: present (exposed) 1/ absent (not exposed) 2.

Obesity, a dichotomous nominal qualitative variable: present (exposed) 1 / absent (not exposed) 2.

Sedentary lifestyle, a dichotomous nominal qualitative variable: present (exposed) 1 / absent (not exposed) 2.

HTA, nominal dichotomous qualitative variable: present (exposed) 1 / absent (not exposed) 2.

Diabetes mellitus qualitative variable nominal dichotomous: present (exposed) 1 / absent (not exposed) 2.

Dyslipidemia, nominal dichotomous qualitative variable: present (exposed) 1 / absent (not exposed) 2.

Data collection. Primary data collection took place in the family physician's offices through a review of each patient's individual medical history, family health history, and interviews with the corresponding family physicians and nurses. This activity was conducted by the researchers themselves, allowing for uniformity in data collection and thus reducing observer bias. A spreadsheet was then created with the collected data for initial analysis.

Statistical analysis

The statistical analysis used the statistical package for the social sciences (IBM SPSS Statistics program, version 25.0), which characterized the sample, which involved a description of all the variables and subsequently determined the degree of association between them; the odds ratio, attributable risk and percentage attributable risk were calculated.

Results



This work by Multimed is licensed under a
<https://creativecommons.org/licenses/by-nc-sa/4.0/>

In the present investigation, the 65 and older age group was the most representative, with 91 cases, representing 54.5% of the total. The least affected group was the 18-49 age group, with 6.0%. Females predominated, with 6 patients, representing 60%. The Pueblo Nuevo I Family Medical Office had the largest number of cases, with 41 patients, representing 24% of the total. The Chucho Reyes Family Medical Office had the smallest number, with 15 cases, representing 8.9% of the total.

The Pueblo Nuevo I family doctor's office had the highest prevalence rate, at 5.6 per 100,000 inhabitants, and the Pueblo Nuevo II office had the lowest, at 1.7 per 100,000 inhabitants. This result provides guidance on where further interventions are needed.

In the present study, the most affected age group was those aged 65 years and over, with 91 cases (54.5%). The association between high blood pressure (HBP) and ischemic heart disease carries a high risk of cardiovascular morbidity and mortality. The study found that this association was as follows: 71.3% in cases and 28.7% in controls. The association measures used included the odds ratio (OR) 5.9, attributable risk (AR) 0.4, and percentage attributable risk (PR%) 69.8%. (Table 1)

Table 1. Distribution of cases and controls according to arterial hypertension.

High blood pressure	Cases	%	Controls	%	Total	%
Present	119	71.3	96	28.7	215	42.9
Absent	48	28.7	238	71.3	286	57.1
Total	167	100	334	100	501	100
OR:6.1 RA:0.3 RA %: 69.8 %						

Smoking accounted for 62.9% of cases and 28.4% of deaths. The calculated risks for this variable were OR 4.3, attributable risk (AR) 0.32, and percentage attributable risk (AR%) 61.5. (Table 2)

Table 2. Distribution of cases and controls according to smoking status.

Smoking	Cases	%	Controls	%	Total	%
Present	105	62.9	95	28.4	200	39.9
Absent	62	37.1	239	71.6	301	60.1



Total	167	100	334	100	501	100
OR:4.3 RA:0.32 RA%: 60.8						

Diabetes mellitus (DM) accounted for 58.1% of cases and 26.9% of controls. Measures of association for these variables yielded the following results: OR 3.8, the attributable risk 0.3 and the percentage attributable risk 58.8.

Family history of ischemic heart disease is one of the main determinants of coronary risk. It was represented in 67.7% of cases and 40.1% of controls. Risk calculations were: odds ratio 3.1, attributable risk 0.24, and percentage attributable risk 53.3%.

Obesity accounted for 61.7% of cases and 38.0% of controls, OR 2.6, attributable risk 0.21, percentage attributable risk 47.7%. Lipid disorders were present in 59.3% of cases and 46.1% of controls. Their association measures: OR 1.7, attributable risk 0.12, percentage attributable risk 30.8%. Alcoholism accounted for 28.1% of cases and 23.1% of controls. The results for the different risks: OR 1.3 attributable risk 0.06 percentage attributable risk 16.2%. Sedentary lifestyles accounted for 62.9% of cases and 58.1% of controls. OR 1.2, attributable risk 0.05 and percentage attributable risk 14.3%.

Discussion

In the study, the female sex predominated, a similar result was obtained in the study carried out by Paz Clara, which showed a predominance of the female sex over the male. (5)

National research such as that carried out by Pérez Martínez at the Celia Sánchez Manduley Hospital, (6) and other international studies such as that developed by Castro-Bolívar differ from this result. (7)

Regarding gender, women's cardiovascular risk is lower because it is related to the hormonal protective effect of estrogen, although postmenopausal risk is high.

Age is one of the most powerful non-modifiable risk factors for developing cardiovascular disease. The majority of the study patients were over 65 years of age which is consistent with data obtained in



previous research such as that carried out in Spain by Sacramento and collaborators, where the average age of the study was 67 years. (8)

Similarly, the health situation of the elderly in Cuba indicates heart disease as the leading cause of death. (9) This situation creates a greater challenge for specialized and quality care for the elderly. The study revealed that patients with hypertension have morerisk of developing the disease, as did Diaztagle Fernández who demonstrated that the risk of coronary ischemia is higher in patients with high blood pressure. (10)The findings suggest the need to optimize HBP screening at the primary care level throughout the country.

Smoking, increases the probability of developing the disease approximately 4 times compared to those who do not have it. Studies in Cuba and the Americas show that smoking is responsible for 25.1% of ischemic heart disease; other studies conducted by the PAHO support these results. (11) It is a priority to especially recommend daily exercise, sports and cultural activities as a way to avoid smoking.

From the evidence obtained in the research it is inferred that people who have diabetes mellitus have a higher risk of developing IHD than those who have not yet developed this disease. This was also demonstrated by Valdés-Ramos, who presents people with DM in whom ischemic heart disease shows a mortality rate between 2 to 4 times higher than the general population. (12)

Diabetes mellitus is considered a "risk equivalent for ischemic heart disease" and deserves special consideration, as it is a risk factor that has increased in prevalence among young people. Vegetable consumption is essential in the prevention of NCD due to its protective effect against cardiovascular disease and diabetes mellitus.

People with a family history of pathology have a three-fold increased risk of developing IHD. Pérez Guerrero adds that a family history of ischemic heart disease is one of the main coronary risk factors. (13)While hereditary or genetic risk factors for heart disease increase susceptibility to the disease and are not modifiable, prevention and control are fundamentally based on lifestyle changes.

Obesity in the study presented a behavior from which it can be said that if a person is obese, they have a greater risk of developing ischemic heart disease than someone who does not have it. If this



risk factor is adequately controlled, the incidence would be significantly reduced. The above is supported by Pereira Rodriguez who states that obese individuals have almost twice the probability of suffering cardiac episodes throughout their life in relation to those who do not have it, in addition it increases the mortality of patients and decreases the expectation and quality of life, especially in young adults. (14) Nutritional education is perhaps the most important aspect of a comprehensive weight-management program, and nutritional assessment is the best way to determine whether a person's nutritional needs are being met.

In relation to lipids, the results showed that high blood cholesterol levels are proportional to developing heart disease, approximately 2 times more than those with normal levels (healthy eating habits). If good metabolic control is achieved, the incidence would be reduced. Díaz-Perera Fernández conducted studies that demonstrated the high risk of association of this factor, which demonstrates the similarity with the research carried out. (15)

Blood lipid variability is determined by endogenous factors related to an individual's metabolism, as well as by exogenous or environmental factors. There is a direct relationship between high blood lipid levels and poor diet, a sedentary lifestyle, and toxic habits. Promoting healthy lifestyles among the population is one of the challenges of contemporary public health.

People exposed to alcohol are more likely to develop IHD than those who do not. The incidence of heart disease is reduced if alcohol is eliminated and can be largely attributed to IHD. Regarding other risk factors, Although in the research it did not constitute the one with the highest degree of association, there is evidence of its relationship with heart diseases such as alcoholism this is how he expresses it Acosta-Ricachi. (16) Alcohol consumption increases with age and becomes more prevalent in adolescence. Public health strategies aimed at raising awareness about the consequences of excessive alcohol consumption must be strengthened.

The results of this research lead to the conclusion that people who do not engage in physical activity in their daily lives have a higher risk of suffering an ischemic cardiac event than those who engage in regular physical activity. Several publications have demonstrated the significant benefits of physical



exercise in the primary and secondary prevention of ischemic heart disease. A study by Mendoza García S et al. showed that active individuals have a lower risk of death from coronary heart disease than sedentary individuals. (17)

In the research, the risk factors with a degree of association with ischemic heart disease were hypertension, smoking habits, diabetes mellitus, presenting similarity with studies from other regions of the Americas such as Peña Mesías who established that the main risk factors linked to ischemic heart disease are: diabetes mellitus, high blood pressure, smoking, dyslipidemia, overweight, obesity, consumption of alcoholic beverages, physical inactivity, sedentary lifestyle, hereditary factors and inadequate nutrition which influence the presence or development of said disease. (18)

Predisposing factors for non-communicable diseases are associated with unhealthy lifestyles and constitute a problem that must be addressed by primary health care. Therefore, intersectoral and community-based actions are required to modify them.

Identifying risk factors for the development of ischemic heart disease will serve as a guide for physicians to respond and reduce the occurrence of the disease in patients with risk factors.

Conclusions

The results obtained in the research demonstrated the direct relationship between aging, the appearance of cardiovascular events, and the predominance of the female sex over the male sex. The risk factors most associated with ischemic heart disease in the territory under study, in descending order, were high blood pressure, smoking, diabetes mellitus, family history, dyslipidemia, alcoholism, and, lastly, sedentary lifestyle.

Bibliographic references



This work by Multimed is licensed under a
<https://creativecommons.org/licenses/by-nc-sa/4.0/>

1. Pan American Health Organization. The 10 leading causes of death [Internet]. Geneva: PAHO; 2024. [cited/10 /Feb /2025]. Available at: <https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>.
2. Grillo Martín M, Mezquia de Pedro N, González-García S. Cardiovascular risk prediction tables used in Cuba. Rev. cuba. cardiol. cir. cardiovasc [Internet]. 2023 [cited 5/2024]; 29(1):e1408. Available from: <https://revcardiologia.sld.cu/index.php/revcardiologia/article/view/1408/pdf>
<https://revcardiologia.sld.cu/index.php/revcardiologia/article/view/1408>
3. Viéitez Flórez JM, García Rivas S, Zamorano Gómez JL. Ischemic heart disease: concept, classification, epidemiology, preventive measures, and non-pharmacological treatment. Medicine [Internet]. 2021 [cited 7/28/2021]; 13(37): 2119-70. Available from: <https://www.sciencedirect.com/science/article/abs/pii/S0304541221001773>.
4. Cuba. Ministry of Public Health. Health Statistical Yearbook. Cuba 2021 [Internet]. Havana: MINSAP; 2022. [cited 03/01/2022]. Available at: <https://files.sld.cu/dne/files/2022/10/Anuario-Estadistico-de-Salud-2021.-Ed-2022.pdf>.
5. Paz CI, Ledezma BM, Rivera Diana M, Salazar ML, Torres MV, Patiño FR, et al. Relationship between functional capacity and family functioning with frailty in older adults at cardiovascular risk in southwestern Colombia. Biomedica [Internet]. 2024 [cited 05/10/2024]; 44: 537–51. Available from: <http://www.scielo.org.co/pdf/bio/v44n4/2590-7379-bio-44-04-537.pdf>.
6. Pérez-Martínez D, Enamorado-Anaya AR, Zamora-Reytor L, Morales-Sosa M, Verdecia-Pompa A. Protective and destabilizing psychological factors in patients with ischemic heart disease. Multimed [Internet]. 2022 [cited 05/01/2022]; 26(4): e2151. Available from: <http://scielo.sld.cu/pdf/mmed/v26n4/1028-4818-mmed-26-04-e2151.pdf>.
7. Castro-Bolívar JF, Castro-Vega O. Cardiovascular risk factors and their prevalence in patients aged 18 to 66 years hospitalized in a tertiary care clinic in Barranquilla. Rev. OFIL-ILAPHAR [Internet]. 2022 [cited 03/21/2022]; 32(2): 129-36. Available from: <https://scielo.isciii.es/pdf/ofil/v32n2/1699-714X-ofil-32-02-129.pdf>.



-
8. Sacramento-Pacheco J, Sánchez-Gómez MB, Gómez-Salgado J, Novo-Muñoz MM, Duarte-Clíments G. Prevalence of Cardiovascular Risk Factors in Spain: A Systematic Review. J Clin Med [Internet]. 2023 Nov [cited 21/10/2023]; 12(21): 6944. Available from: <https://doi.org/10.3390/jcm12216944>.
9. Pérez Álvarez DA, Vitón-Castillo AA, Bustinzuriaga Marto I, Díaz Pita G, Díaz Esquivel AM. Cardiovascular risk in older adults at the “5 de Septiembre” Polyclinic in Consolación del Sur. Univ. Med. Pinareña [Internet]. 2022 [cited 2023-03-23]; 18(4):e924. Available from: <https://revgaleno.sld.cu/index.php/ump/article/view/924/pdf>.
10. Diaztagle Fernández JJ, Canal Forero JE, Castañeda González JP. Arterial hypertension and cardiovascular risk. REPERT MED CIR [Internet]. 2022 [cited 15/12/2022]; 31(3): 230-41. Available from: <https://revistas.fucsalud.edu.co/index.php/repertorio/article/view/1160/2213>.
11. Pan American Health Organization. The Economic and Social Impact of Smoking [Internet]. Washington, DC: PAHO; 2021. [Cited 15/12/2022]. Available at: <https://www.paho.org/en/events/session-1-economic-social-impact-smoking>.
12. Valdés-Ramos E, Álvarez-Aliaga A. Clinical characteristics of patients with diabetes mellitus complicated by ischemic heart disease. Multimed [Internet]. 2022[cited 15/12/2022]; (26)2: e2633. Available from: <http://scielo.sld.cu/pdf/mmed/v26n2/1028-4818-mmed-26-02-e2633.pdf>.
13. Pérez Guerrero JL, W Arias Salazar. Familial aggregation for ischemic heart disease. Rev. Finlay [Internet]. 2022 [cited 15/12/2022]; 12(3):314-21. Available at: <https://www.medigraphic.com/pdfs/finlay/fi-2022/fi223h.pdf>.
14. Pereira-Rodríguez JE, Peñaranda-Florez DG, Pereira-Rodríguez R, Pereira-Rodríguez P, Santamaría-Pérez KN. Cardiovascular responses of obese patients in the exercise stress test. CorSalud [Internet]. 2020 [cited 12/12/2022]; 12(2): 162-72. Available from: <http://scielo.sld.cu/pdf/cs/v12n2/2078-7170-cs-12-02-162.pdf>.
15. Díaz-Perera-Fernández G, Alemañy-Díaz-Perera C, Alemañy-Pérez E. Diseases resulting from atherosclerosis in a population attended by four medical practices. Cuban Journal of Medicine [Internet]. 2022 [cited 12/12/2022]; 61(4): e1625 Available
-



at:<http://scielo.sld.cu/pdf/med/v61n4/1561-302X-med-61-04-e1625.pdf>.

16. Acosta-Ricachi C, Quinapanta-Serrano S, Moina-Veloz Á. Alcoholism and inflammatory response: implications for liver and cardiovascular disease. *Finlay Journal* [Internet]. 2024 [cited 05/10/2024]; 14(3): 322-9. Available from:<https://revfinlay.sld.cu/index.php/finlay/article/view/1427/2446>.

17. Mendoza García SJ, Delgado JC, Caldrón Moreira MC, Castro Soriano AB, Bajaña FA, Erazo Villacreses ML. Prevention of patients with cardiovascular sedentary lifestyle problems. *Cien* [Internet]. 2019 [cited 9/10/2025]; 5(1): 32-52. Available from:<https://dialnet.unirioja.es/servlet/articulo?codigo=6869947>.

18. Peña Mesías MA, Reyes Santana BG, Durán Cañarte AL. Ischemic heart disease and risk factors in the older adult population in Latin America. *MQRInvestigar* [Internet]. 2023 [cited 02/13/2023]; 7(1): 653–71. Available from:<https://www.investigarmqr.com/ojs/index.php/mqr/article/view/186/715>.

Conflict of interest

The authors declare that there are no conflicts of interest.

Authorship Contribution

Geovanny Machado Méndez: study design, bibliographic review, data collection, writing, critical review of the article and approval of the final report.

Ana Julia Quezada Font: bibliographic review, critical review of the article and approval of the final report.

Deilys Pérez Martínez: study design, bibliographic review, data collection, critical review of the article, and approval of the final report.

Ana Mirtha Guzmán Ortiz: study design, bibliographic review, data collection

Carlos Mario Morales: study design, bibliographic review, data collection, and approval of the final report.



This work by Multiméd is licensed under a
<https://creativecommons.org/licenses/by-nc-sa/4.0/>