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Major adverse cardiovascular events: analysis of diabetics with coronary syndrome on prior use of acetylsalicylic acid

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Major adverse cardiovascular events: análisis de diabéticos con síndrome coronario en el uso previo de ácido acetilsalicílico

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Abstract

Objective: To investigate diabetic patients admitted toa private hospital with acute coronary syndrome who had previously used acetylsalicylic acid to prevent major adverse cardiovascular events. **Methodology:** It is a descriptive study with a quantitative approach. Data collection was extracted from the chest pain protocol of a private institution in Rio de Janeiro in the local emergency room with geriatric audiences, between the year 2013 and June 2019 we counted 312 diabetic patients with acute coronary syndrome. **Results:** Of the 312 diabetic patients, 151 used acetylsalicylic acid early and 161 did not use ASA previously. Of these, respectively, 5 had a diagnosis of infarction with supra and 22of the diabetic patients who did not use ASA had a diagnosis of AMI with supra in the emergency room. **Conclusion:** Aspirin use plays a crucial role in preventing major adverse cardiovascular events. Finally, the previous use of ASA remains as an immediate treatment for individuals with ACS, even before or after hospital admission.

Descriptors: Aspirin; Cardiovascular Nursing; Acute Coronary Syndrome; Diabetes mellitus.

Resumo

Objetivo: Investigar os pacientes diabéticos internados em um hospital privado com síndrome coronariana aguda que faziam uso prévio de ácido acetilsalicílico como prevenção do *major adverse cardiovascular events*. **Metodologia:** É um estudo descritivo, com abordagem quantitativa. A coleta de dados foi extraída do protocolo de dor torácica da instituição privada do Rio de Janeiro na emergência local com público geriátrico, entre o ano de 2013 a junho de 2019 contabilizamos 312 pacientes diabéticos com síndrome coronária aguda. **Resultados:** Dos 312 pacientes diabéticos, 151 utilizaram ácido acetilsalicílico precocemente e 161 não utilizaram AAS previamente. Deste, respectivamente 5 apresentaram diagnostico de infarto com supra e 22 dos pacientes diabéticos que não utilizaram AAS apresentaram diagnóstico de IAM com supra na emergência. **Conclusão:** O uso de aspirina desempenha um papel crucial na prevenção do *major adverse cardiovascular events*. Por fim, o uso prévio do AAS permanece como tratamento imediato aos indivíduos que apresentam SCA, mesmo antes da admissão hospitalar ou após.

Descritores: Aspirina; Enfermagem Cardiovascular; Síndrome Coronariana Aguda; Diabetes mellitus.

Resumen

Objetivo: Investigar pacientes diabéticos ingressados en urgências por síndrome coronário agudo y que habían utilizado previamente ácido acetilsalicílico para prevenir eventos adversos cardiovasculares mayores. **Metodología:** Es un estudio descriptivo con enfoque cuantitativo. La recolección de datos se extrajo del protocolo de dolor torácico de una institución privada en Río de Janeiro en la sala de emergencias local con público geriátrico, entre el año 2013 y junio de 2019 contamos 312 pacientes diabéticos con síndrome coronario agudo. **Resultados:** De los 312 pacientes diabéticos, 151 usaron ácido acetilsalicílico temprano y 161 no usaron AAS previamente. De estos, respectivamente, 5 tenían diagnóstico de infarto con supra y 22 de los pacientes diabéticos que no utilizaban AAS tenían un diagnóstico de IAM con supra en la sala de emergencias. **Conclusión:** El uso de aspirina juega un papel crucial en la prevención de eventos cardiovasculares adversos mayores. Finalmente, se mantiene el uso previo de AAS como tratamiento inmediato para personas con SCA, incluso antes o después del ingreso hospitalario.

Descriptores: Aspirina; Enfermería Cardiovascular; El Síndrome Coronario Agudo; Diabetes Mellitus.

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INTRODUCTION

The epidemiological data of diabetes mellitus (DM) covers about 200 million people worldwide. It is noteworthy that DM increases according to the age of the population: 21.6% of Brazilians over 65 years of age reported having the disease, a more significant rate than among people aged between 18 and 24 years, with only 0.6% of this age group having diabetes[1].

DM is a risk factor for cardiovascular diseases (CVD) because the inflammatory process caused by it plays a key role in the development of atherosclerosis. Individuals with diabetes have double the risk of death caused by CVD when compared to the general population without the disease[2].

Among them is the acute coronary syndrome (ACS), which is caused by obstruction of the coronary arteries, resulting from the presence of arteriosclerosis in the vascular bed, blocking the blood flow, causing myocardial ischemia. Of the cases of ACS, 90% occur due to the presence of arteriosclerosis in the blood vessel, caused by inflammatory activity. This inflammatory process is induced by the release of catecholamines, cytokines and induction of glycogenolysis, generating a vicious cycle[3].

The cycle begins with inflammation, which contributes to increased production of neutrophils, macrophages, and synthesis of interleukin-6 (IL-6). IL-6 promotes the production of C-reactive protein (CRP) by liver cells. CRP levels increase in recurrence in trauma, inflammation, and infection. For this reason, CRP levels are commonly used for monitoring various inflammatory conditions [3].

CRP decreases blood vessel vasodilation, causing greater shear stress, greater vessel damage, inducing chemotaxis of coagulation cells, leukocytes, and oxidized LDL- to the vascular endothelium, contributing to the promotion of atherosclerosis [3].

The use of drugs, such as antiplatelet agents, delays the development of atheroma. Antiplatelet agents inhibit the action of cyclooxygenases (COX) enzymes that convert arachidonic acid into thromboxane A^2, which stimulates platelet aggregation. Acetylsalicylic acid (ASA) being an antiplatelet, is used as the first choice for prevention of major adverse cardiovascular events, inhibiting formation of these arteriosclerotic plaques[4].

Major adverse cardiovascular events, also known as MACE, is defined as several adverse events included in different surveys such as: heart failure, non-fatal re-infarction, recurrent angina pain, re-hospitalization for CVD-related diseases, repeat percutaneous coronary intervention (PCI), coronary artery bypass graft surgery and all those causing mortality (acute myocardial infarction - AMI or stroke). The detection and treatment of atherosclerotic risk factors for MACE are essential to improve health and longevity[4].

Atheromatous plaques have higher lipid content in diabetic than in euglycemic clients. Diabetics have a higher mortality risk than non-diabetics. In view of this, studies show that ASA reduces mortality from ACS and reinfarction rate in diabetics by 22%[3,4].

ASA is the most commonly used drug for the prevention of CVD in diabetic clients. The disease is responsible for 75% of deaths in this population. Research shows that, in primary prevention, ASA reduces mortality by 17.7%, while in secondary prevention it reduces mortality by 98%[5].

Besides chest pain, there are other symptoms to diagnose cardiac ischemia, such as dyspnea, gastric pain, sweating, tachycardia, hypertension, among others. In order to speed up the care of these clients, the hospital institutions have adopted the use of institutional protocols, with the objective of offering quality care and early detection of symptoms, providing a better prognosis for these patients[6]. The management protocol assists the professional in providing quality care, agility, detecting and preventing AMI with the use of antiplatelet drugs[6].

It is understood that platelet antiaggregants aggregate benefits in preventing AMI. Given this, the knowledge of health professionals on the subject minimizes MACE. As a member of the health team, the nurse is responsible for the integral attention to the client, for the promotion of health and prevention of diseases, it becomes evident the need to appropriate specific knowledge, facilitating the substitution of conducts previously accepted as safe, effective, and precise[7].

In this context, the aim of this research is to investigate diabetic patients admitted to the emergency department for acute coronary syndrome who were previously using acetylsalicylic acid to prevent major adverse cardiovascular events.

METHODOLOGY

This is a documental, descriptive study, with a quantitative approach, with a sample collected through secondary data extracted from the chest pain protocol of a private institution in the city of Rio de

Janeiro (RJ), between the year 2013 and June 2019, with data from diabetic patients who were admitted to the local emergency room with a picture of Acute Coronary Syndrome (ACS) between these years.

In the data evaluation, the subjects considered eligible for inclusion in the research were: patients with DM diagnosis who were admitted with chest pain in the emergency room with ACS diagnosis and were inserted in the spreadsheet; diabetic patients with ACS used ASA previously and those who did not. The exclusion criteria were: non-diabetic patients; patients with inconclusive outcomes contained in the data sheet; and patients with non-existent data on the use or not of antiplatelet drugs (ASA).

The clients were divided into two different groups, group 1: diabetic clients who had previously used ASA, group 2: clients with DM who had not previously used ASA (before hospital admission). Then, the outcomes of these patients were quantified in the emergency department and in the Coronary Care Unit (CCU) in subgroups, comparing those who developed infarction with supra; ACS without supra and chest pain not angina in the emergency department. The outcomes of the CCU were patients transferred to a hospitalization unit; discharge to home and death.

The statistical analysis of the study was extracted from the Excel spreadsheet of the institution that accounts for all clients who opened chest pain protocol since 2013. In the predetermined time frame, there were 905 clients admitted to the local emergency department, 312 of whom were diabetic. In this study, only diabetic patients were studied. The collected data were stored in a database of Excel 2013 program, later transformed into absolute numbers and relative frequency.

To ensure the ethical aspects, determined in Resolution 466/12, authorization was requested from the research field through a letter of consent to the general director of the institution in question. This study was previously approved by the Research Ethics Committee of the Adventist College of Bahia (FADBA), with opinion no. 3,741,990. The participants' anonymity was guaranteed through data coding.

RESULTS

Of the surveyed 312 (100%) were diabetics; 140 (44.8%) were female; 172 (55.12%) were male. Of the total number of diabetics, those classified with risk factors were alcoholic 8 (2.5%), 15 (4.8%) smoker, 25 (8%) had coronary heart disease, 196 (62.8%) dyslipidemia (DLP) and of 226 (72.43%) hypertensive.

The diabetics admitted in the emergency with ACS had divergent results. Of the patients who used ASA, 151 (100%), of these, 5 (3%) evolved to diagnosis of AMI with supra; 56 (37%) were diagnosed with ACS without supra and 90 (59%) were diagnosed with chest pain without angina. Patients who did not use ASA previously were 161 (100%). Of these, 22 (13%) were diagnosed with AMI with supra in the emergency department; 87 (54%) presented ACS without supra and 52 (32%) were diagnosed with chest pain not angina, according to table 1.

Table 1. Diagnosis in the emergency of diabetic patients who used ASA previously and those who did not use ASA between the year 2013 to 2019, admitted with ACS in a private hospital in Rio de Janeiro, 2019.

Prior use of ASA	Yes 151 (100%)	No 161 (100%)
Diagnosis of two diabetic patients	**Use of AAS**	**No use of ASA**
AMI with supra	5 (3%)	22 (13%)
SCA without supra	56 (37%)	87 (54%)
Chest pain without angina	90 (59%)	52 (32%)

After hospital admission and detected diagnosis, 50 (33%) patients who had previously used AAS were transferred to the CCU; 8 (5%) to hemodynamics; 93 (61%) left the protocol or were discharged, and no deaths were registered. As for the patients who had not previously used AAS, 69 (42%) were transferred to the CCU; 12 (7%) to hemodynamics; 80 (49%) were removed from the protocol or discharged, and no deaths were recorded, according to table 2.

Table 2. Outcomes of diabetic patients who used ASA previously and those who did not use ASA between the year 2013 to 2019, admitted to the emergency department with ACS in a private hospital in Rio de Janeiro, 2019.

Outcomes of diabetic patients in the emergency department	**Use of ASA**	**No use of ASA**
Transferred to CCO	50 (33%)	69 (42%)
Hemodynamics	8 (5%)	12 (7%)
Discharged from the protocol	93 (61%)	80 (49%)
Deaths	0 (0%)	0 (0%)

The results of the patients admitted to the coronary unit who had previously used AAS were 50 (100%); of these, 38 (76%) were transferred to the ward, 9 (18%) were discharged and 3 (6%) died. And finally, diabetic patients who did not use AAS previously were 69 (100%); of these 55 (79%) were transferred to the ward; 11 (15%) were discharged home and 3 (4%) died.

DISCUSSION

Post-AMI diabetic patients are more likely to present with MACE. In fact, AMI is the leading cause of death in diabetic individuals, with a higher risk of recurrences in MACE and mortality after AMI[8]. The diabetic contains atheroma plaques with higher lipid content, thrombosis, and infiltration by macrophages in the coronary tissue. In addition to the high proportion of infiltrated inflammatory cells; more active pro-inflammatory state, and greater likelihood for atherosclerosis formation[9].

Atherosclerosis is the leading cause of death among diabetics, accounting for 80% of all deaths and 75% of hospitalizations[10]. The American Diabetes Association (ADA) NOC has advised prophylactic treatment with aspirin to prevent MACE[11]. International guidelines recommend aspirin as first line for primary prevention of AMI and other atherosclerotic cardiovascular diseases[12]. In 1989, the Physician's Health Studies reported a 4% reduction in the risk of first AMI in male participants receiving aspirin and a 2% reduction in the risk of stroke in women[13].

The ADA recommends the use of 70 to 162 mg of aspirin per day for CVD prevention in diabetic clients at risk, i.e., men over 50 years and women over 60 years, with multiple risk factors, provided that, with low risk of gastrointestinal bleeding and no contraindications to the use of ASA[14,15].

Some risk factors were reported in an analytical study, carried out in a Regional Hospital in the Federal District, which investigated one hundred patients diagnosed with ACS, from 71 patients had hypertension, 43 were smokers and 31 had diabetes mellitus[16].

Hypertension, diabetes, smoking, alcoholism, among others, are considered risk factors for ACS. In this study, 15 (4.8%) smokers, 226 (72.43%) hypertensive individuals and 196 (62.8%) dyslipidemic individuals (DLP) were found. With these data it is pertinent to recognize the need for health education, with preventive actions to risk factors, contributing to reduce the impact of cardiovascular diseases. The nurse must recognize the risk factors involved in the triggering of ACS, in order to act more incisively in the development of programs capable of reducing morbidity and mortality from CVD [14].

To reduce the factors and mortality of this disease, it is essential to increase preventive education, delaying admissions. Of the patients admitted for ACS in a hemodynamic service in Goiás, with a total of 519 patients, 262 (83.54%) were admitted to the intensive care unit for acute ST elevation myocardial infarction, with a length of stay of five days[16].

In the study, 69 (42%) of the patients who had not previously used ASA were transferred to the CCU and 50 (33%) were the patients who had previously used ASA. The diagnoses of AMI in patients who did not use ASA totaled 22 (13%) diabetics. Despite the clear benefit of aspirin to patients at risk of ACS, the results reflect in the time of hospitalization, diagnosis, and mortality rate.

However, we should emphasize that besides the use of ASA to reduce cardiovascular events in this population, the focus of treatment should also involve changing habits and reducing risk factors, through dietary re-education, exercise, glycemic control, and actions that can significantly reduce the incidence of ACS and the rates of MACE [14].

Health professionals should encourage health actions that contribute to healthy habits for the studied population. In this sense, nursing acts as a member of the health team has the most diverse ways to promote health, as an educational process, aiming to educate these individuals in the best use of ASA to prevent MACE[6].

Thus, hospital institutions have adopted the use of institutional protocols, which provide health institutions with a good parameter to promote specific and strategic care. In addition to generating greater safety for the customers assisted. The adoption of this technology for health care promotes significant improvement in care and provides data for research[6].

The contribution of this study is to encourage health professionals to use institutional data that contribute to significant changes for the care, education, and guidance to patients according to local data.

Therefore, the units that act in chest pain care need to know the network to which they are integrated, in order to facilitate the compression of clients and useful to optimize the quality of care.

Finally, the study presented the index of diagnoses for AMI and the results of diabetic patients who used ASA previously and those who did not, discarding the benefits of this medication and the guidance of healthy habits actions. Thus, the nursing contribution is to guide these patients on the benefits of using the medication, as well as the contraindications, and lead patients to periodic care, in order to avoid major cardiovascular events.

CONCLUSION

Finally, when it comes to diabetic patients, primary or secondary prevention with the use of aspirin brings benefits to clients. However, in addition to pharmacological treatment, educational action to improve quality of life remains the gold standard for ACS prevention. The healthcare team, especially nurses, should educate and encourage healthy habits and the correct use of ASA on a daily basis.

Regarding the proposed objective of this study, we evaluated the most prevalent risk factors (hypertension and diabetes) for ACS, as well as the patients who used and who did not use ASA previously. Most patients admitted to the CCU were diabetic patients who did not use aspirin, as well as those who were transferred to the hemodynamics sector.

Finally, the previous use of ASA remains as immediate treatment to individuals who present ACS, even before hospital admission or after. We should highlight that, the early detection of ACS speeds up the treatment of clients, providing better prognosis. Due to this, we support the use of the assistance protocol (chest pain protocol) based on scientific evidence that contributes to the increase of patient's survival and improves the quality of assistance, aiming to reduce mortality.

AUTHORS' COLLABORATION

Statistical analysis, Data collect, Project management, Methodology, Writing - Preparation of the original: Edna Rodrigues Melo

Conceptualization, Writing - Review and Editing, Supervision, Validation: Fernanda Ribeiro Carvalho

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