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MORTALITY AND LIFESTYLE AFTER MYOCARDIAL INFARCTION: A COHORT STUDY

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ABSTRACT

This study aimed to analyse the mortality, lifestyle and adherence to treatment after myocardial infarction. It´s a cohort study, with quarterly follow-up after hospital discharge, using the questionnaire Fantastic and the Measurement of Treatment Adherence (MTA). Participated 41 individuals, 80.5% male, mean age 56,2±10,1 years, 65.9% with hypertension, 36.6% diabetics, 31.7% smokers, 24.4% drink alcohol, 75.6% sedentary. The death rate was 4.8% in one year. Smokers and those who drink alcohol had worst lifestyle. In one year, smokers and alcohol consumption decreased. Sedentary lifestyle decreased and after nine months it increased again. Lifestyle improved up to the sixth month with subsequent worsening, as well as adherence to treatment that was higher until the ninth month. Lifestyle was considered good for 39% and 31.7% very good. Treatment adherence was high (71%). The results indicate that after a heart attack, permanent lifestyle changes should be encouraged to minimize complications and deaths.

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INTRODUCTION

Non-communicable Diseases (CNCDs) are characterized as one of the biggest public health problems nowadays. Estimates by the World Health Organization (WHO) indicate that CNCDs are responsible for 68% of a total of 38 million deaths worldwide in 2012 (ABESO, 2016). In Brazil, CNCDs are highly relevant for their social impact and in 2011 accounted for 68.3% of total deaths, with emphasis on cardiovascular diseases (30.4%), attributed to a set of risk factors responsible for deaths and several problems resulting from this disease. Among these factors, smoking, inadequate food consumption, physical inactivity and excessive consumption of alcoholic drinks stand out (ABESO, 2016). Among CNCDs, Cardiovascular Diseases (CVD) are the main cause of death worldwide, regardless of the income of countries, and are responsible for three out of every 10 deaths (TIMERMAN, BERTOLAMI, FERRREIRA, 2012). Cardiovascular diseases cause a large number of early deaths and generate social unproductiveness for individuals, generate a decrease in quality of life and significant impacts on the family and social economic area. It is important to know the life habits of individuals after acute myocardial infarction (AMI) and the death rate in order to establish mechanisms to prevent the onset of these diseases, preventing acute myocardial infarction, which stands out due to the high rate of morbidity and mortality (OLIVEIRA, PUSCHEL, 2015). Long-term research on survival after a coronary event in small cities is of great interest, as most studies in this area focus on patients treated at referral cardiology centers, but most post-AMI patients return to their cities in non-specialized hospitals (SBC, 2014).

MATERIALS AND METHODS

This is a cohort study, conducted in a cardiological hospital in Santa Catarina, Brazil. Patients with myocardial infarction participated in the study and for one year, quarterly, answered questionnaires for lifestyle and adherence to treatment analysis. The Fantastic Lifestyle Questionnaire was used to lifestyle analysis. This instrument has 25 questions divided into nine domains: 1) family and friends; 2) physical activity; 3) nutrition; 4) cigarettes and drugs; 5) alcohol; 6) sleep, seat belt, stress and safe sex; 7) type of behavior; 8) introspection; 9) work. The questions are arranged in a likert scale, 23 have five alternative answers and two are dichotomous. The sum of all points makes it possible to reach a total score that classifies individuals into five lifestyle categories, which are: "Excellent" (85 to 100 points), "Very good" (70 to 84 points),

"Good" (55 to 69 points) points), "Regular" (35 to 54 points) and "Needs improvement" (0 to 34 points). The origin of the word "fantastic" comes from the acronym FANTASTIC which represents the letters of the names of the nine domains (in English) in which the 25 questions or items are distributed: F = Family and friends (family and friends); A = Activity (physical activity); N = Nutrition; T = Tobacco & toxics (cigarette and drugs); A = Alcohol; S = Sleep, seatbelts, stress, safe sex (sleep, seat belt, stress, safe sex); T = Type of behavior (behavior pattern; behavior pattern A or B); I = Insight (introspection); C = Career (work; satisfaction with the profession). To analyze adherence to treatment, was used the modified Measurement of Treatment Adherence (MTA). This test was applied quarterly, after hospital discharge. The modified MTA is a questionnaire consisting of four items. The score obtained ranges from 0 to 4, with a value of 1 for each negative answer obtained. High adherence to treatment is considered to patients who obtain a score of 4 points, a medium adherence score of 2 to 3 points and low with 0 to 1 point. The initial questions classify the patient's behavior with a predisposition for non-adherence into two types, intentional (questions 3 and 4) and unintentional (questions 1 and 2). When patient answer 'yes' to at least one of the initial questions, two additional questions are asked to assess the reason for non-adherence. Question 5 refers to knowledge about the importance of treatment and question 6 is related to lack of motivation for adherence. Numerical data were analyzed by means and standard deviations and categorical data by numbers and percentages. The association of quantitative variables with each other was performed by Student's T test and categorical variables by Chi-square and Fisher's exact test. To correlation between variables was used Pearson's correlation coefficient. A 95% confidence interval was adopted. All patients signed the Free and Informed Consent Form and this study was approved by an Ethics Committee.

RESULTS

Participated 41 patients, mostly male (80.5%), mean age 56.2 ± 10.1 years. After three months, the sample consisted of 34 patients, after six months 28 patients, after nine months 20 patients, and after one year, 23 patients. The characteristics of the patient profile are shown in Table 1.

Table 1. Profile of patients with acute myocardial infarction. Santa Catarina, Brazil

Caracteristics	N(%)
Hypertension	27(65,9)
Diabetics	15(36,6)
Smokers	13(31,7)
Sedentary	31(75,6)
Drink alcohol	10(24,4)
Myocardial infarction with ST-segment elevation	13(31,7)
Angioplasty	27(65,9)
Myocardial revascularization surgery	8(19,5)
Thrombolytic therapy	4(9,8)
Previous myocardial infarction	6(14,6)

Table 2 shows the lifestyle of patients with acute myocardial infarction, relating to socio-demographic and health variables. It is observed that smokers and those who drink alcohol had a worse lifestyle. Regarding the Body Mass Index (BMI), the average was 28.2±4.7 Kg/m^2 at the time of admission, and the BMI of women was lower than men, but with no significant difference (p=0.07), as well in the relation of BMI according to age (p=0.85). There is a positive correlation between the score on the BMI and the score on the Fantastic questionnaire, so that people with higher scores (better lifestyle), had a lower BMI (r=0.3; p<0.05). Analyzing people who had ST-segment elevation myocardial infarction (STEMI), those with no ST elevation had better lifestyle (p=0.11).

Tabela 2. Lifestyle of patients with acute myocardial infarction. Santa Catarina, Brazil

Variables	Lifestyle	p
Gender		
Male	64,1±11,2	0,49
Female	67,3±11,4	
Age		
> 60 years	66,5±10,1	0,44
< 59 years	63,8±11,8	
AMI		
With ST-segment elevation	60,6±13,8	0,11
Without ST-segment elevation	66,7±9,5	
Hypertension		
Yes	65,6±11,8	0,50
No	63,2±10,1	
Diabetes		
Yes	63,2±10,8	0,50
No	65,6±11,5	
Smoker		
Yes	58,5±11,4	0,02
No	67,7±9,9	
Drink alcohol		
Yes	59,0±9,6	0,05
No	66,6±11,1	
Sedentary		
Yes	64,6±11,7	0,86
No	65,3±9,9	

Lifestyle: 0-34= needs improvement; 35-54=regular; 55-69=good; 70-84=very good; 85-100=excellent.

Table 3. Lifestyle and health habits after Acute Myocardial Infarction in individuals after hospital discharge

Variables	At the hospital N(%)	3 months after AMI N(%)	6 months after AMI N(%)	9 months after AMI N(%)	12 months after AMI N(%)
Sedentary	31 (78)	29 (70,7)	23 (56,0)	25 (61,0)	17 (73,1)
Smoker	13 (31,7)	5 (12,2)	5 (12,2)	3 (7,3)	2 (4,9)
Drink alcohol	10 (24,4)	6 (14,6)	5 (12,2)	3 (7,3)	4 (9,8)
Lifestyle*	64,8	76,2	75,0	71,0	71,7
Adherence to treatment	-	21 (51,2)	23 (56,1)	25 (61,0)	23 (56,1)
BMI (average)	28,2	26,9	27,3	27,4	27,2

*Fantastic questionnaire: excellent (85 a 100 pontos), very good (70 a 84 pontos), good (55 a 69 pontos), regular (35 a 54 pontos), needs improvement (0 a 34 pontos).

Table 3 shows the lifestyle in the period of one year after AMI, where there is a decrease in the number of smokers, a decrease and then an increase in the number of sedentary people and people who drink alcohol. The lifestyle improved up to six months after AMI and after reduction, as well as adherence to treatment was greater up to nine months after AMI and suffered a reduction. As for the lifestyle of patients with acute myocardial infarction during hospitalization, it was considered good for 39%, very good for 31.7%, regular 22% and excellent 7.3%. During the study period, two patients died, corresponding to a death rate of 4.8%. Both were overweight, sedentary, did not have a healthy diet and had some chronic non-communicable disease (hypertension and/or diabetes). When analyzing cardiac enzymes, it was observed that age had an inverse and significant relationship with troponin values, and the older the age, the lower the troponin value (p<0.04).

Women had higher CK-MB ($p<0.04$), and total CK-MB ($p<0.00$). Regarding adherence to treatment after AMI, in the first and second trimester of follow-up, adherence was high to 71%, 26% had average adherence and 3% low adherence. In the last semester, all individuals had high adherence. When asked about the reasons for non-adherence, in the first trimester the carelessness with the schedule was the main reason to forget to take the medication, in the second trimester the item that stands out is forgetting.

DISCUSSION

AMI was more frequent in men and with a mean age of 56.2 years, similar to that observed in other studies[5]. Between 2008 and 2016, 21,398 cases of deaths from AMI occurred in Brazil among men and women aged 30 to 59 years, and in most regions, males prevailed with 13,587 deaths, among these deaths, the highest incidence was in the age group 50 to 59 years, in both sexes (MEDEIROS *et al*, 2018). About existing morbidities, hypertension and diabetes have been frequent in cardiac patients, and the risk of a diabetic person developing cardiovascular disease is two to three times higher than non-diabetic individuals, which is why it is recommended to intensify the monitoring by programs already existing for patients with diabetes and hypertension in order to minimize the risk of AMI (COELHO, RESENDE, 2010; MEDEIROS *et al*, 2018, COSTA *et al*, 2017). Some studies show a reduction in smokers, but the World Health Organization estimates that 21% of the adult world population is a smoker, in its 2015 report on the Global Tobacco Epidemic, reports that tobacco use has been associated with about 100 million deaths worldwide during the 20th century, with about 6 million deaths annually, predicting that smoking is responsible for 45% of deaths from heart attack (SILVA *et al*, 2017). During the follow-up of patients after AMI, a reduction in tobacco use was observed over the course of one year. Several government studies and programs warn of the need to maintain an active life, avoid physical inactivity through physical activity aiming at a better quality of life for people, studies still show considerable prevalence of physical inactivity and excess body weight among the population, which can be attributed to the current rhythm of people's lives (CARLUCCI *et al*, 2014). In a survey carried out in Minas Gerais, 58.2% of infarcted patients were sedentary (COELHO, RESENDE, 2010). However, in this study an improvement in adherence to the practice of physical activity was observed right after the heart attack, and the practice of physical activity must be seen as a health need, as well as public policies to encourage the practice of physical activity. Multiprofessional team rehabilitation programs need to be strengthened and more efficient, consequently preventing major complications throughout life, decreasing costs with the treatment of chronic non-communicable diseases.

There was a predominance of overweight people, who remained in the first year after AMI, with a minor drop during the follow-up period, as well as a sedentary lifestyle that also did not have good results even after AMI, an alarming finding considering that obesity it is a chronic disorder directly associated with coronary artery disease (CAD), considerably increasing the chances of morbidity and mortality, and knowing that weight loss can decrease mortality and the risk of CAD and diabetes (GOMES *et al*, 2009). It´s necessary constant intervention and monitoring by the teams of health assistance in order to encourage individuals to adhere to the care related to healthy eating and physical activity. Excessive alcohol consumption significantly increases the appearance of cardiovascular diseases, considerably aggravating cardiovascular risk factors such as arterial hypertension, diabetes, smoking and obesity. Alcohol abuse was associated with a two-fold increase in atrial fibrillation, 1.4 times the incidence of acute infarction and 2.3 times the occurrence of heart failure, this incidence is identical to that related to classic risk factors such as diabetes, hypertension and obesity (ABESO, 2016). Regarding adherence to a balanced diet, soon after discharge there was an increase in healthier eating habits, however, in the last three months, a new decrease in adherence and an increase in the return to unhealthy eating began to be observed. A study carried out with post-AMI patients, showed that the fruit intake before the infarction was 20% of the sample and subsequently increased to 55% and the fat and fried food intake decreased from 27% to 7% (GALLO, LAURENTI, 2014). Therefore, it is considered that the individual, when exposed to a situation of risk of death, seeks to improve eating habits soon after discharge, but with the passage of time the old habits return, reinforcing the need for constant monitoring by an interdisciplinary team.

At admission, individuals stated that they had the ability to deal with daily conflicts and sought leisure time, but this scenario improves even more after AMI, where care about time and leisure remains above that analyzed in pre-infarction. It was also possible to observe that the individuals were angry and were always in a hurry, that leaving things for later irritated them with the family, employees and with oneself, however it is possible to identify that this behavior improves after discharge keeping low levels, referring to maintaining a positive thinking about life. As for feelings such as tension, disappointment, sadness and depression, most reported that they were part of daily life, after discharge there is a considerable improvement in this aspect. The treatment´s choice in this institution was angioplasty, followed by myocardial revascularization and finally the use of thrombolytics, in relation to this treatment choice, studies indicate that the invasive strategy has been the first choose mainly in the case of non-elevated infarction, demonstrating expressive success rates and reduction of deaths after discharge from AMI (COELHO, RESENDE, 2010; MEDEIROS *et al*, 2018, COSTA *et al*, 2017). Studies show greater survival and less occurrence of complications in patients with STEMI when the technique with primary angioplasty is used, showing a 25% reduction in deaths and a 64% reduction in reinfarction (TIMERMAN, BERTOLAMI, FERRREIRA, 2012).

As for adherence to treatment, it was high among the individuals monitored, and among patients with average adherence to treatment, eight reported not adhering to treatment due to unintentional issues and one intentionally. A study carried out in Colombia in 2015, shows similar data and during the post-AMI follow-up 54% of the patients adhered to the treatment correctly, 45% partially and 1% did not adhere to the treatment (REYES, FLORES, 2016). The death rate in this study was low, considering that post-discharge deaths of patients diagnosed with AMI often exceed 10%. The two patients who died had several risk factors, as well as a high probability of mortality through the TIMI score. One of these patients still had tachycardia, and the presence of this sign indicates a great myocardial impairment, which can lead to heart failure (SBC, 2014). Both were also overweight, which considerably increases morbidity and mortality and reduces

life expectancy, since obesity, regardless of its cause (heredity, sedentary lifestyle, poor eating habits) has a strong correlation with the onset of AMI (LIMA *et al*, 2018).

Conclusion

During the year of follow-up, it was observed that the lifestyle undergoes some positive changes in the first six months of follow-up, but after nine months of the infarction, with the return of routine activities and in the absence of complications, the individual feels more safe and confident to return to old harmful habits, increasing the risk of new infarction or other diseases, which reinforces the importance of the multidisciplinary team in the care of these patients for a long period. It was observed that smokers and those who drink alcohol had a worse lifestyle, men had a higher BMI than women and people with a better lifestyle had a lower BMI. Some limitations of the study are characteristic of cohort research, such as the decrease in the sample, as it has difficulty maintaining contact with individuals for a long period.

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