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Construction and Validation of the CADE-Q for Patient Education in Cardiac Rehabilitation Programs

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Abstract

Background: Being aware of the coronary artery disease can be considered the first step to reduce the risk of cardiac complications.

Objective: Building and validating a tool to assess and describe coronary patients' awareness in cardiac rehabilitation programs, with the purpose of education.

Methods: For the construction, we analyzed articles and field studies to submit items to multidisciplinary team associated to cardiac rehabilitation. After this analysis, we generated the version tested in a pilot study. The tool, named CADE-Q (Questionnaire for Coronary Patient Education) was applied in 155 patients aged 61 ± 9 (min = 36, max = 86) in response to cardiac rehabilitation programs. Out of the 155 patients, 114 were men. Internal consistency was measured by Cronbach's alpha coefficient. Reproducibility was tested by the intraclass correlation coefficient (ICC) and construct validity was performed by exploratory factor analysis. The analysis compared the total scores as a function population characteristics and rehabilitation groups (private and public).

Results: The final version has 19 questions with 4 alternatives, with 4 quadrants of awareness. Cronbach's alpha was 0.68 and ICC was 0.783. The factor analysis revealed 6 factors, covering three areas of awareness, which demonstrates the multifactorial nature of the instrument. The population characteristics as a function of the total score showed significant differences depending on the socioeconomic status variables (type of rehabilitation, household income and education level).

Conclusion: CADE-Q has proper validity and reliability to be used in the Brazilian population in future research. (Arq Bras Cardiol 2010;94(6) : 763-771)

Key words: Questionnaires/utilization; education; coronary diseases; rehabilitation.

Introduction

In recent years, the concept of health has evolved and changed from 'state of absence of disease' to 'a positive concept focusing on personal and social aspects as well as physical, mental and spiritual aspects' related to many factors, including the opportunity to education and awareness[1,2].

Every year, cardiovascular diseases (CVD) are responsible for 16.7 million deaths around the world, and according to the World Health Statistics (2008), these deaths will increase to 23.4 million worldwide in 2030[3].

Cardiac rehabilitation programs aim getting coronary patients back to an optimal level of recovery, enabling this individual to acquire and maintain better health conditions and reduce the risk of death and acute events related to their disease. To achieve these goals, interventions are combined, and correctly and conveniently applied. These interventions include educational programs[4,5].

The raising of awareness associated with multidisciplinary programs to control coronary artery disease (CAD) helps patients achieve an adequate perception of their health status, changing beliefs, behaviors and bad habits[5-9].

However, for coronary patients to be truly aware of their disease, symptoms, lifestyle, risk factors and treatments, it is necessary to evaluate how much patients know about their disease. Therefore, the development and/or improvement of instruments capable of undertaking such an evaluation become critical[10,11].

The use of questionnaires or instruments of assessment is an important resource in educational health programs, because they measure the effects of teaching and learning, and the potential changes in attitudes on CAD. It is also a way to learn individual needs and the conditions for the implementation of an educational process[7,9-12].

Original Article

Therefore, the purpose of this study was to construct and validate a tool to assess and describe coronary patients' awareness in cardiac rehabilitation programs, for the purposes of education.

Methods

Preparation of the questionnaire

Based on Pasquali[13], the process of developing and validating the tool named CADE-Q - Questionnaire for Education on Coronary Artery Disease - included three steps with three different procedures: theoretical, empirical and analytical. The theoretical procedure referred to the theoretical foundation on the construct for which we intended to develop a measurement tool. The empirical procedure is also called experimental and consisted of steps and techniques for applying the pilot instrument, as well as collecting information that could evaluate the properties of the instrument. The analytical procedure determined the statistical analyses of data in order to validate the instrument.

Therefore, the development of the CADE-Q instrument consisted of the following steps:

1) Searching texts and articles to build up an inventory. Such inventory was supposed to carry key information that patients need to know about CAD, as well as, for the selection of items that should be known by coronary patients, a qualitative field research was performed with patients in cardiac rehabilitation programs with 50 items to be part of the instrument;

2) Presenting items to a multidisciplinary team of professionals associated with the Cardiac Rehabilitation Program – composed of physicians, nurses, physical educators, physiotherapists, nutritionists and psychologists - to assess the content, relevance and conceptual and cultural analysis of the questions, generating the First Version with 20 multiple choice questions, each question containing 4 choices;

3) The First Version was submitted to a pilot study in 30 patients to evaluate the understanding of the issues (clarity) and dispel doubts about the structure of questions and answers. Using a scale from zero to 10, each patient should assign a score to the clarity of the questions, giving rise to the level of clarity, according to Pasquali's[13] clarity criterion.

4) After the analysis, some items were developed and one question was removed, creating the Final Version of CADE-Q with 19 questions.

Validation

Data collection took place in Florianópolis, state of Santa Catarina, from August to November 2008, 155 coronary patients selected at random, provided that they had been participating in cardiac rehabilitation programs for at least a month. The application was done by researchers in a standardized, (before or after the sessions), collective and supervised manner (to ensure privacy and anonymity of the results) without any interaction between evaluators and respondents. The data were analyzed using the program SPSS 13.0 - Statistical Package for Social Sciences, and the significance level adopted was 0.05.

Psychometric analyses were performed to evaluate the validity and reliability of the CADE-Q.

The construct validity was assessed through the factor analysis. To check the suitability of the data to such analysis, we assessed Keiser-Meyer Olkin's index (KMO), to assess the factorability of intercorrelation matrices on which the factor analysis is based. Then, Bartlett' sphericity test was performed to determine whether the data met the sphericity requirement[14,15].

We used the principal component analysis to extract factors, considering only those with eigenvalues greater than one, combined with scree plot. After the factors have been selected, a factorial matrix was generated to observe the relationships between items and factors by means of factor loadings. To interpret the matrix, we applied the method of Principal Component Extraction by orthogonal rotation, using the method Equamax[14,15].

The reliability assessment includes two main ways: internal consistency and reproducibility. Internal consistency was assessed by Cronbach's alpha in all individuals subject to the application of the instrument, based on the minimum value of 0.60[14]. Reproducibility was assessed using the intraclass correlation coefficient, using test and retest situations. The time interval between tests was two weeks, testing 25 individuals of the pilot study, also selected in a simple and random manner.

To check CADE-Q's outcomes for some population characteristics (age, sex, comorbidities, surgical procedures related to CAD, type and time of cardiac rehabilitation, education level and household income), we compared the total scores according to such variables. We also checked the outcomes as a function of the 4 quadrants of awareness. By testing the distribution of data through the Kolmogorov-Smirnov test, it was found that the variables of the scale resultants were normally distributed ($p > 0.1$). Considering this, we used ANOVA and Bonferroni's post hoc test.

There are other types of validity of instruments found in literature[12], such as the Concurrent Validation, which consists in the correlation of an instrument under validation with a scientifically validated one[12]. However, as there are few instruments in literature that assess coronary patients' awareness and most of them consist of yes/no and true/false questions - such as MICRO-Q[7] - which may not reflect patient's real awareness of the disease, this method was discarded.

The research was conducted within the standards required by Helsinki Declaration and approved by the Ethics and Human Research Committee of the University of Santa Catarina (UDESC) according to resolution CNS 196/96. All individuals were informed about the goals of the research, data confidentiality, and signed a Consent Form.

Results

Preparation of the questionnaire

To select important items for the composition of the instrument, we performed a field research with patients in cardiac rehabilitation programs. Patients were mainly interested in learning about the following: physical symptoms,

such as shortness of breath, chest pain (48.0%), exercising and sport (39.0%), recovery of the heart (29.0%) and questions about how life goes with the disease (22.0%). These results are similar to other studies evaluating the quantity and quality of information gained about the disease in everyday life of coronary patients[16,17].

After this research, were prepared and presented 50 items to the multidisciplinary team of professionals associated to the Cardiac Rehabilitation Program, which generated the First Version of CADE-Q with 20 questions.

In the pilot test performed in 30 patients, on a zero to 10 scale, the index of clarity[13] of questions was 9.4 ± 1.3, indicating that the questionnaire is easily understood by the target population. However, examining the questions separately, question 17 (Angiotensin-converting Enzyme Inhibitors (ACE) are?) showed a level of clarity of 1.5 ± 1.4, and was later excluded from the questionnaire[13]. Still in the pilot test, we observed the average time required for patients to fill out the questionnaire: 13 ± 4 minutes.

CADE-Q's final version is a self-applied questionnaire comprising 19 multiple choice questions with 4 alternatives each: a correct statement representing full knowledge, a correct statement representing incomplete knowledge, an incorrect statement representing wrong knowledge, and an 'I do not know' statement representing no knowledge (Annex 1). Both alternatives, 'full knowledge' and 'incomplete knowledge', are correct. The difference lies in the point of view of the level of knowledge: the complete alternative brings a more scientific and thorough knowledge, which is probably transmitted by health professionals to the patient; the incomplete alternative brings a correct knowledge of the question, but a popular one, which may be acquired, for example, through non-scientific media.

The aim of the questionnaire is educating patients with coronary disease, by assessing and describing the level of knowledge of such patients. Patients with other heart diseases cannot be assessed with such instrument.

The questions were divided into 4 areas of knowledge: A1, related to coronary artery disease; A2, diagnosis and drug therapy; A3, on risk factors and lifestyle; and A4, related to exercising. The questions were randomly arranged and could be part in more than one quadrant.

For each alternative, we established scores which, together, lead to a total score, which indicate the degree of knowledge about CAD, as well as knowledge of each specific area. The scores established for each alternative are: correct statement representing full knowledge = three; correct statement representing incomplete knowledge = one; incorrect statement representing wrong knowledge = zero; and 'do not know' statement, representing no knowledge = zero. Based on Sommaruga et al[7], in spite of representing different situations, the 'incorrect' and 'do not know' statement received equal scores, because in the case of instruments of knowledge, they have similar implications. Whereas the purpose of this instrument - patient education - having a wrong understanding or not having any understanding about a given subject determines the need for education, which justifies the scores given.

The sum of the scores establishes the patient's total level of knowledge, and the maximum score is 57 points. Table 1 shows the classification of knowledge level based on other studies[7,13].

The participants are characterized by a personal data sheet attached to the instrument.

Validation

The sample consisted of 155 patients, of which 114 were men. The 155 patients participated in cardiac rehabilitation programs (40.0% private, 60.0% public), with participation time of 33 ± 46 months (min = 1, max = 360, Md = 18) and age 61 ± 9 (min = 36, max = 86). All patients had comorbidities associated with CAD and hypertension (HBP) was the most frequently found (72.0%), followed by dyslipidemia (64.0%) and congestive heart failure (CHF) (24.0%). Regarding the surgical procedures related to the disease, 105 individuals have undergone some type of cardiac surgery.

Socioeconomic status was characterized by household income and educational level. In the analysis of the types of rehabilitation - public and private - we observe that patients in public programs have lower income and educational level, and 66.0% earn 1 to 5 minimum wages per month and 39.0% have completed primary education. Patients in private programs have greater income and higher education levels: 45.0% earn more than 20 monthly wages and 61.0% have university degree.

The characteristics of the population under study are described in Table 2.

Validity

Regarding construct validity, we performed a preliminary analysis to ensure normality of data and suitability for factor analysis. The Kolmogorov-Smirnov test revealed normal distributions for all items. After the data were found normal, we analyzed Keiser-Meyer Olkin's index (KMO) and Bartlett's sphericity test to check suitability of data for factor analysis[14,15]. The KMO index was 0.608 and Bartlett's sphericity indicated that the correlation matrix is not an identity matrix ($X^2 = 348.8$, $p < 0.001$). Together, these indicators ensured that the data set has the necessary requirements for factor analysis[15].

The factor analysis of data was done by "Principal Component Extraction" by "orthogonal" rotation, by the method Equamax. Considering the load factors above 0.3[14]

Table 1 - Classification of patients' level of knowledge according to scores

Sum of scores	Percentage	Classification of knowledge
From 51 to 57 points	From 90 to 100%	Excellent
From 40 to 50 points	From 70 to 89%	Good
From 29 to 39 points	From 50 to 69%	Acceptable
From 17 to 28 points	From 30 to 49%	Little knowledge
Below 17 points	Below 30%	Insufficient knowledge

Table 2 - Characteristics of coronary patients participating in the research (n = 155)

Variable	Category	n	% total
Gender	Male	114	73.
	Female	41	26.5
Comorbidities*	HBP	111	71.6
	Dyslipidemia	99	63.9
	CHF	37	23.9
	DMII	31	20
	PAD	27	17.4
	DMI	9	5.8
	COPD	2	1.3
Surgeries**	MR	33	21.3
	Angioplasty	47	30.3
	MR+Angioplasty	24	15.5
	Other	1	0.6
	None	50	32.3
Type of rehabilitation	Private	62	40
	Public	93	60
Monthly household income	Up to 1 salary	12	7.7
	From 1 to 5 salaries	63	40.6
	From 5 to 10 salaries	25	16.1
	From 10 to 20 salaries	24	15.5
	Above 20 salaries	31	20
Education level	Never attended school	1	0.6
	Incomplete elementary/middle education	22	14.2
	Complete elementary/middle education	36	23.2
	Incomplete high school	6	3.9
	Complete high school	29	18.7
	Incomplete higher education	9	5.8
	Complete higher education	42	27.1
	Post-graduate education	10	6.5

* HBP - high blood pressure; CHF - Congestive heart failure; DMI - diabetes mellitus type I; DMII - diabetes mellitus type II; PAD - peripheral arterial disease; COPD - chronic obstructive pulmonary disease. **MR - myocardial revascularization.

with the aid of the method of "Principal Axis Analysis", several extractions were made and the solution found to be most appropriate[13] was the 6-factor one, which explain 56.1% of total variance of individuals' responses. Table 3 presents the empirical structure of the instrument with the factor loadings of each question in the 6 factors extracted.

The first factor "General Factor" refers to the 12 questions that assess all fields of knowledge, with greater predominance in the area of pathophysiology, signs and symptoms. Factor two included 8 items called "Causal Factor", with greater predominance in the field of diagnosis, treatment and medicines

(4 items), risk factors and lifestyles (4 items) and exercising (4 items). The third factor included 4 items, with greater predominance in the field of risk factors and lifestyles. Therefore, it was called "Risk Factors Factor". As factors 4, 5 and 6 did not prevail in areas, they have been termed "Other Factors".

Internal consistency - tested via Cronbach's alpha coefficient - was 0.68. The test-retest reliability was assessed by intraclass correlation coefficient (ICC), whose value was 0.783.

Descriptive analysis

Through the Personal Data Sheet attached to the instrument, we analyzed the characteristics of the population according to the total score obtained: age, sex, comorbidities associated (hypertension, CHF, diabetes mellitus type I - DMI, diabetes mellitus type II - DMII, peripheral arterial disease - PAD, dyslipidemia, and chronic obstructive pulmonary disease - COPD), surgical procedures related to CAD, type of cardiac rehabilitation (public or private), time of cardiac rehabilitation, education level and monthly household income[16,17].

It was observed that there are no significant differences in total scores due to age (p = 0.240), comorbidities - having hypertension or not (p = 0.487), having CHF or not (p = 0.310), having DMI or not (p = 0.612), having DMII or not (p = 0.335), having PAD or not (p = 0.781), having dyslipidemia or not (p = 0.625), having COPD or not (p = 0.999), duration of cardiac rehabilitation (p = 0.599).

However, total scores revealed significant differences according to gender (p = 0.04), surgical procedures (p = 0.02), type of cardiac rehabilitation (p = 0.02), monthly household income (p < 0.001) and education level (p = 0, 02). These data demonstrate the influence of socioeconomic status in patient's level of awareness, as reported in studies[7,18-25].

By analyzing cardiac rehabilitation groups (public and private) according to the characteristics, we found no significant differences regarding age, gender, comorbidities, surgical procedures related to CAD and cardiac rehabilitation time. However, significant differences (p <0.001) were found according to educational level, monthly household income and total score.

At this stage, the average time of application of the instrument was 14 ± 4 minutes. This time was higher in individuals with lower levels of knowledge (17 minutes).

The implementation of CADE-Q revealed a total score of 43.01 ± 6.5, which corresponds to a knowledge of 75.0% of the total scoring presented in the questionnaire. As for classification, we found a prevalence of 'good knowledge' type in 66.0% of patients (n = 102). As for the alternatives identified, it is observed that 69.63% of the questions had the full knowledge option checked, 17.9% of incomplete knowledge, 5.7% of wrong knowledge and 6.8% of "do not know".

Examining the questions, we observe that such behavior does not occur in questions 9, 10 and 11, considered critical items. The interval and the average of correct answers per question are shown in Table 4.

Regarding the 4 areas of knowledge into which the questionnaire is divided, the comparison between the averages pointed out significant differences between the areas studied

Original Article

Table 3 - **Empirical structure of the tool**

Items	Factor Loadings					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
1	.317			.396	.471	
2					.388	
3	.361					.705
4	.615					
5	.411	-.357				.377
6		.476				
7		.343			.502	
8	.526					
9			.562	-.313		
10	.352	.434				-.421
11		-.425		.556		
12	.542					
13	.358		-.390		-.533	
14	.534	.324				
15	.441					
16			.688			
17			.353	.528		
18	.486	-.465				
19	.421	-.490				

(p = 0.03). The best scores were observed in A2 (risk factors and lifestyles), concentrating 90.0% of responses between great and good. The worst levels of knowledge were found in the area of diagnosis, treatment and medicines (A3), with 34.0% of responses ranging from acceptable to poor.

Discussion

The process of constructing and validating an instrument in the field of health requires a great effort[10]. Because of this, in Brazil we note a lack of instruments to measure knowledge about CAD. This study contributes towards equipping health professionals with an instrument to establish educational strategies focused on patients' real needs.

In the construct validity, although the KMO indicator and Bartlett's sphericity test have pointed out that the data sets had the prerequisites for factor analysis, the factor solution was not appropriate because the instrument items have multidimensional characteristics, mostly comprising more than one field of knowledge. However, the factor analysis alone cannot determine that an instrument is invalid[13]. In this case, CAD is a multifactorial disease. Because of that, the instrument was adapted to cover the largest number of factors related to the disease, which the factor analysis eventually corroborated, since each of the 6 factors includes at least three fields of knowledge.

Also concerning validity, the results show that there is consistency of measures in successive applications in the same

group, that is, accurate and stable data[14]. This is because, in terms of internal consistency, Cronbach's alpha revealed no homogeneity among the questions, since it was above the minimum value of 0.60 reported by some authors[14], despite the multifactorial nature of the disease previously reported.

Looking at the test-retest reliability, the ICC value was very close to what literature suggests[14] (0.8), demonstrating stability of the instrument, i.e., successive applications of the same instrument produced the same or similar outcomes.

The final version of CADE-Q (Questionnaire for Education on Coronary Artery Disease) is self-applied and consists of 19 multiple-choice questions with 4 alternatives each, divided into 4 quadrants of knowledge: coronary artery disease, diagnosis and medication, risk factors and lifestyle, and exercising.

Concerning the descriptive analysis, total scores revealed significant differences according to the variables representing socioeconomic status (type of cardiac rehabilitation, monthly household income and educational level). This shows that socioeconomic status is influencing coronary patients' knowledge of their disease, as reported in studies[7,18-25].

Because 'learning' is at the heart of human adaptation skills, and because patient's education is not only "practice", but "movement", much of patient's knowledge is related to acquired information, values, attitudes, moral judgments, patterns of behavior through observing and socializing. Individuals can educate themselves and acquire knowledge through rules of behavior observed in certain media or social

Table 4 - Intervals and average of correct answers to CADE-Q Questionnaire

Questions	Interval n(%)			
	Correct	Incorrect	Wrong	Do not know
Q1	77(49.7)	64(41.3)	5(3.2)	9(5.8)
Q2	148(95.5)	3(1.9)	2(1.3)	2(1.3)
Q3	130(83.9)	15(9.7)	3(1.9)	7(4.5)
Q4	111(71.6)	27(17.4)	7(4.5)	10(6.5)
Q5	119(76.8)	23(14.8)	2(1.3)	11(7.1)
Q6	133(85.8)	11(7.1)	7(4.5)	4(2.6)
Q7	109(70.3)	43(27.7)	1(0.6)	2(1.3)
Q8	67(43.2)	48(31.0)	24(15.5)	16(10.3)
Q9	**66(42.6)**	**85(54.8)**	**3(1.9)**	**1(0.6)**
Q10	**55(35.5)**	**31(20.0)**	**0(0)**	**69(44.5)**
Q11	**8(5.2)**	**57(36.8)**	**66(42.6)**	**24(15.5)**
Q12	117(75.5)	34(21.9)	3(1.9)	1(0.6)
Q13	139(89.7)	13(8.4)	0(0)	3(1.9)
Q14	113(72.9)	19(12.3)	12(7.7)	11(7.1)
Q15	98(63.2)	37(23.9)	1(0.6)	19(12.3)
Q16	137(88.4)	8(5.2)	7(4.5)	3(1.9)
Q17	139(89.7)	4(2.6)	5(3.2)	7(4.5)
Q18	141(91)	3(1.9)	7(4.5)	4(2.6)
Q19	137(88.4)	10(6.5)	6(3.9)	2(1.3)
Average	13.23 (69.6)	3.41 (17.9)	1.08 (5.7)	1.32 (6.8)

Note: Bold questions represent critical items.

levels, which we define as the influence of socioeconomic status, also reported in this study[7-9, 19].

Although only the characteristics related to socioeconomic status have shown significant differences, other factors (age, sex, associated comorbidities, time of cardiac rehabilitation, surgical interventions related to the disease) may influence the acquisition of knowledge of coronary patients and should be described in studies using this instrument[4,7,10,26].

The inclusion of patients with different times of participation in cardiac rehabilitation programs showed no influence on the knowledge neither on the reliability of the questions, perhaps because the samples have shown large asymmetry (SD = 46.21). It was found that patients who have been 1-6 months in the programs had scores of 43 ± 7. Patients with over 120 months in programs had lower knowledge scores (42 ± 8). Despite the insignificant results, the time of cardiac rehabilitation is an important point in studies evaluating patients in treatment programs, which can be explored in future studies, addressing, for example, knowledge before and after a certain period.

The average of total scores, corresponding to 75.0% of knowledge of the total presented in the questionnaire, differs from studies where it is estimated that 30 to 78.0% of coronary patients do not fully understand educational information transmitted to them[27]. This reveals that education in clinical

practice is often inappropriate, inconsistent and inaccurate, but when patients are enrolled in cardiac rehabilitation programs, they have greater contact with knowledge, once the team of professionals involved in these programs reviews concepts, sets aside misleading ideas and beliefs and encourages healthy habits, educating patients[4].

The critical items (questions 9, 10 and 11) reveal that, although the patients had good total scores, some important and fundamental information to coronary patients are missing[17], such as appropriate diet, optimal blood lipid values and absolute contraindication for physical exercising, respectively.

Although it is not the goal of this study, it is known that using such tools provides groups and individuals with an opportunity of increasing their levels of understanding of CAD, that is, it provides education targeted at cardiac rehabilitation programs[7,27]. Moreover, such studies and can be quite useful in developing strategies to encourage patients' adherence to cardiac rehabilitation programs, as well as interfering with the success of this intervention, since it is not known how patient's knowledge is translated into concrete actions towards optimal health[28,29].

We also suggest that further studies associating knowledge with therapy acceptance, follow-up and success, which represent the clinical validation of the tool scientifically designed and validated in this study.

Original Article

Conclusion

CADE-Q questionnaire produced appropriate levels of reliability and validity and can be used to assess the knowledge of coronary patients in cardiac rehabilitation and, where necessary, establish educational programs focusing on patients' education about their disease.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Study Association

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Annex 1 - Full questionnaire CADE-Q validated.

1. Coronary arterial disease (CAD) is:

a. An alteration to heart arteries found in the elderly, affecting smokers with high cholesterol.

b. An alteration to heart arteries that usually begins in childhood. It is influenced by bad lifestyles and can be genetic and immunoinflammatory.

c. An alteration to heart arteries related to age which, over time, impairs the memory of those affected.

d. I do not know.

2. Which combination of factors has greater influence on the development of CAD?

a. Intake of small amounts of alcohol.

b. Environmental (such as climate) and socioeconomic factors (such as household income).

c. Smoking, abnormal levels of blood fats (dyslipidemia) and hypertension.

d. I do not know.

3. Which of the following is related to a typical symptom of CAD?

a. Headache after meals.

b. Chest pain or discomfort during physical exercising.

c. Chest pain or discomfort at rest or while exercising, which can migrate to arms and/or back and/or neck.

d. I do not know.

4. Also concerning CAD, we can state that:

a. Ii is associated with obstruction of the arteries that supply the heart due to the formation of atherosclerotic plaque (fat deposits on the artery wall), which may lead to angina (chest pain).

b. Acute myocardial infarction (AMI) is the only manifestation of CAD.

c. The presence of angina suggests the diagnosis of CAD.

d. I do not know.

5. The best time on the day for CAD patients to practice exercises prescribed is:

a. In the afternoon or evening, as morning exercising may increase the risk.

b. At no time because physical exercising it is not recommended for individuals with CAD, due to high risk.

c. At any time of the day, because the benefit outweighs the risk.

d. I do not know.

6. From the tests listed below, which are the most accurate ones in diagnosing and prognosing CAD:

a. X-ray and chest MRI.

b. Stress test (ergometric) and cardiac catheterization.

c. Electrocardiogram at rest and clinical history.

d. I do not know.

7. What is the optimal treatment to reduce blood lipids (blood fats)?

a. Physical exercising and diet are enough.

b. Physical exercising and diet and, whenever required, statin.

c. There is no treatment, because high levels of cholesterol and triglycerides are genetic.

d. I do not know.

8. About coronary vasodilators such as nitrates and nitrites, why and how should they be used?

a. These drugs should be used continuously and/or in situations of chest pain, their administration is oral and/or sublingual, improving the flow of blood into the heart arteries.

b. These drugs should be used sublingually in emergency situations to relief chest pain.

c. These drugs are used to decrease blood pressure and bad cholesterol (LDL) in patients with cardiac problems. They are administered only orally.

d. I do not know.

9. What is the diet recommended for patients with CAD?

a. A diet with low salt, low fat and rich in fibers.

b. A diet based on: whole meal pasta, vegetables, fish, extra virgin olive oil and nuts.

c. A normal diet, since diet is not a very relevant factor.

d. I do not know.

10. Which values of total cholesterol, LDL and HDL are, respectively, ideal in patients with CAD (values in mg/dl):

a. Below 200, below 100 and above or equal to 60.

b. Below 200, between 100 and 129 and between 40 and 60.

a. Above 240, above 100 and below 40.

d. I do not know.

11. Which corresponds to an absolute contraindication for physical exercising?

a. Recent acute myocardial infarction (AMI).

b. Acute infections (e.g. influenza).

c. Hypertensive crisis (high blood pressure).

d. I do not know.

12. If you feel any discomfort related to his heart problem, such as angina (chest pain), you must:

a. Drive your car straight to the hospital seeking medical attention.

b. Try to relax, wait the pain to stop and, during this period of time, seek medical attention.

c. Chew one or two tablets of acetylsalicylic acid and/or use a sublingual vasodilator (nitrate), coughing vigorously, trying to relax and seek medical advice.

d. I do not know.

13. Based on your knowledge on exercising and CAD, please answer the following:

a. It is part of the treatment because it helps control risk factors, increases survival and improves quality of life.

b. Should never be performed by patients with this disease because of the high risk of death.

c. Should only be included in the treatment when the patient is clinically stable.

d. I do not know.

14. Physical activity for CAD patients must:

a. Respect the patient's needs, which are analyzed by stress test and be prescribed individually.

b. Start as soon as the disease is diagnosed with mild physical activity.

c. Be equal for same sex and same age, because this group of individuals has the same fitness and risk.

d. I do not know.

15. Which alterations, considered favorable and

resulting from regular physical exercise, are most important to patients with CAD?

a. Improvement in endothelial function, increased collateral circulation, and even a possible regression of the atherosclerotic plaque.

b. Decreased heart rate (HR) at rest, increased force of heart contraction and improved lipid profile.

c. Increased blood pressure (SBP), triggering episodes of tachycardia and increased triglycerides.

d. I do not know.

16. Physical activity for individuals with CAD should be performed:

a. Anywhere, lasting for 30 minutes on a daily basis, and may be cumulative (10 min in the morning, 10 minutes in the afternoon and 10 min in the evening).

b. At an appropriate place, monitored by a qualified professional, aiming at self- sufficiency.

c. In a clinical or hospital environment.

d. I do not know.

17. High values of blood pressure (BP) indicate a state of hypertension (high blood pressure). Therefore, in CAD:

a. Having normal pressure or hypertension does not interfere with this disease.

b. A BP 140/90 mmHg is normal.

c. An ideal PA is 120/80 mmHg.

d. I do not know.

18. On stress, so present in our daily lives, we can say that:

a. It is one of the risk factors that trigger MI (myocardial infarction).

b. It is part of the group of risk factors that are less important for CAD.

c. It does not interfere with cardiac diseases, once this disease is totally physical and not related to psychological factors.

d. I do not know.

19. Which interventions used in treating CAD can extend and improve quality of life?

a. Changes in lifestyle + medical treatment + in some cases, surgical treatment.

b. Drug therapy + in some cases, surgical treatment.

c. Drug therapy + extended rest + surgical treatment.

d. I do not know.

Original Article

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