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ORIGINAL ARTICLE

Quality of Life in Patients After Acute ST-Segment Elevation Myocardial Infarction

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Abstract

Background: ST-segment elevation myocardial infarction (STEMI) is the acute coronary syndrome with the highest severity and mortality. It can affect physical health and well-being of patients, and consequently their quality of life (QoL).

Objective: To describe the QoL of patients at 30 days and 180 days after STEMI, focusing on sex differences and repercussions on physical and mental dimensions.

Methods: Observational study with 174 STEMI patients included in the study on STEMI conducted in the city of Salvador, Brazil (PERSISST). The QoL of patients at 30 days (D30) and 180 days (D180) after the coronary event was assessed using the 12-item short form health survey (SF-12). Physical and mental components of QoL were calculated using the SF-12 OrthoToolKit. Descriptive analysis of data was made using the IBM SPSS software, version 25.0.

Results: Mean age of participants at D30 and D180 was 57.1±11.4 years and 60.5±10.9 years, respectively, with a higher prevalence of men (55.8% and 56.8%). In general, patients had a poor QoL at both time points (scores 49.1±8.9 and 49.9±8.4, respectively). Analysis by sex, however, showed that men had a good QoL at both 30D (score 51.8±7.4) and 180 D (score 51.3±7.7), whereas a poor QoL was found among women at these time points (45.7±9.6 and 48.1±9.0, respectively). Men showed higher physical and mental health scale scores than women at both D30 and D180, and there was a greater impairment of the physical component in both sexes.

Conclusion: Patients had poor QoL at 30 days and 180 days after STEMI, with a greater impairment of the physical component and a worse QoL perception among women than men at both time points.

Keywords: ST Elevation Myocardial Infarction; Quality of Life; Coronary Artery Disease.

Introduction

Cardiovascular diseases (CVD) are one of the main causes of death in the world, accounting for 31% of global deaths,[1] and 85% of these deaths are caused by coronary events and cerebral vascular accidents.[1-3] in Brazil, at least 20% of individuals older than 30 years of age die from CVD, with discrepancies in mortality rates between the five main geographic regions of the country. In the state of Bahia, 24.1% of deaths (27.3% of them in the city of Salvador)[4] were from acute myocardial infarction (AMI) between 2008 and 2018, and therefore, this condition is one of the most important causes of cardiovascular deaths in the state.

AMI may have different clinical presentations, including the ST-segment elevation myocardial infarction (STEMI), in which a complete occlusion of the coronary artery occurs.[5] A delay in the diagnosis of STEMI, and consequently in myocardial reperfusion increases morbidity and mortality.[5,6] Therefore, treatment success is associated with an immediate access to reperfusion therapy to restore blood flow,[6,7] which increases survival and reduces the risk of complications.[8]

Potential complications of AMI include reinfarction, heart failure, angina, and death.[5] In addition, mental health status may be affected in some patients, who have

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Central Illustration: Quality of Life in Patients After Acute ST-Segment Elevation Myocardial Infarction

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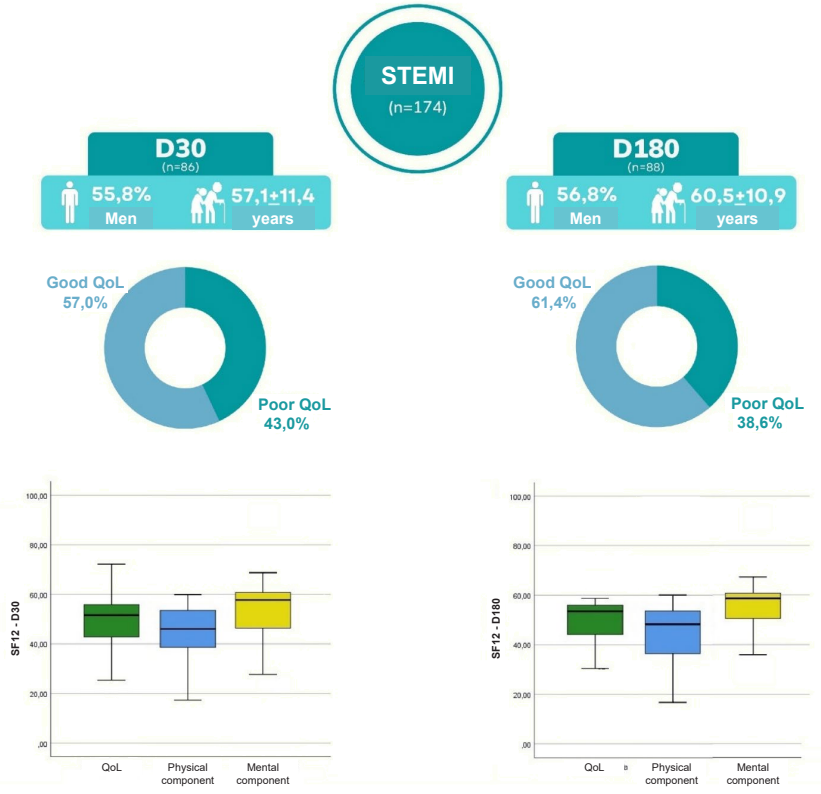

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QoL in patients at 30 days (D30) and 180 days (D180) after STEMI QoL: quality of life; SF-12: 12-item short form health survey

an increased risk of depression, anxiety and/or fear of a new event.[9] Therefore, coronary involvement may lead to a reduction in quality of life (QoL), health status and vitality, and impairment of function, social relationships and mental health.[10]

Considering that the presence of STEMI may affect patient QoL, it is important to assess this effect 30 days and 180 days after the coronary event, considering sex differences and repercussions on physical and mental dimensions, and this is the objective of the present study.

Methods

This was an observational, descriptive study, derived from the PERSISST study,[11,12] which was a study on STEMI conducted in Salvador, Brazil, created from the regional integrated network for the management of this condition. In 2009, this network was implemented due to the low availability of reperfusion treatment in the public health system in the city of Salvador, aiming to increase the rates of this therapy and reduce morbidity and mortality.[10,11] In 2017, the study on STEMI conducted in the city of Salvador, Brazil (PERSISST) was started with the objective to assess the flow of STEMI patients who received ambulance services according to the AMI protocol or were treated in public health centers in Salvador metropolitan area, and the outcome of these patients.

The target population of this study was patients with diagnosis of STEMI who received medical services according to the AMI protocol, met the inclusion criteria for the PERSISST (Table 1) and were interviewed from May to October 2020.

A convenience sample were recruited from those patients who answered the Short Form Health Survey (SF-12)[13] at 30 days (D30) and/or 180 days (D180) after the coronary event. Patients who declined to sign the consent form were not included in the interview. Also, patients who could not be contacted by telephone, and those who signed the informed consent form, but their questionnaires were answered by someone else were

Table 1 - Inclusion criteria for the study on STEMI in Salvador, Brazil (PERSISST study)

Age equal to or older than 18 years, regardless of sex
Admission to public emergency centers in the city of Salvador, or pre-hospital ambulance care with suspected STEMI
Confirmed diagnosis of myocardia by increased levels of myocardial necrosis markers (creatine kinase-M, troponins) and enzyme curves compatible with AMI

Source: PERSISST study. AMI: acute myocardial infarction

not included in the study. Following the PERSISST project, at 30 and 180 days after the coronary event, the SF-12[13] was applied to assess self-reported QoL. The SF-12 comprised 12 items, divided into two domains – a physical component, composed of physical functioning, physical performance, pain and general health, and a mental component, composed of emotional performance, mental health, social functioning, and vitality.

Data collection was performed by trained medical school students, responsible for patient follow-up. The questionnaires were administered prospectively, in-person or by telephone, based on patient preference. Most (90%) questionnaires were administered by telephone, and 10% were administered in person by a cardiologist, at the waiting room of the health care center. This was because of restrictions imposed by the COVID-19 pandemic and, despite this, and both methods of administration strictly followed the same instructions and procedures.

After data collection, two groups were defined for data analysis, D30 and D180; it is important to point out that some patients did not participate in both time points, and their QoL could not be compared. Therefore, the groups were composed of different individuals, who answered the survey at 30 days or at 180 days after the infarct. The results were analyzed using the SF-12 OrthoToolKit, which calculates the physical and the mental scores. Scores above 50 indicated a good QoL and scores below 50 indicated poor QoL.

The study met the requirements of the 466/12 and 510/16 norms of the Brazilian National Health Council and was approved by the ethics committee of Bahia Secretariat of Health (CAAE 58949416.7.0000.0052, approval number 4.330.336).

Statistical analysis

A descriptive analysis was made using the IBM SPSS software, version 25.0. First, normality of data distribution was assessed and confirmed by the Shapiro-Wilk test. Then, numerical variables were expressed as mean and standard deviation (SD), and categorical variables as absolute and relative frequencies. A $p<0.05$ was set as statistically significant.

Results

A total of 195 patients with STEMI were identified as eligible for the study. However, 10.8% of these patients did not answer the questionnaire and the final sample was composed of 174 patients, 49.3% of them at D30 and 50.6% at D180. There was a higher prevalence of men at both time points, and mean age was not different between the groups (Table 2, Central Figure).

The SF-12 scores (Table 2, Figure 1) indicated poor QoL of participants at both D30 and D180, with higher mental and physical scores among men than women. A greater impairment of physical QoL was observed in both men and women.

Women had a worse perception of QoL than men at both time points, and satisfactory mental scores at D180 only. Among men, the highest scores were obtained from the SF-12 mental component scores at both D30 and D180 (Table 2, Figure 1).

Discussion

The present study assessed the QoL of STEMI patients, participants in the PERSISST study, at 30 days and 180 days after the event, focusing on differences between genders and on physical and mental repercussions of the disease.

Regarding sex and age distribution of our patients, most patients were men, corroborating the data described by Alves and Polanczyk,[2] who reported a predominance of male patients among those who experienced a coronary ischemic event, aged between 56 and 64 years, as described by Costa et al.[14]

Table 2 - Patients' characteristics and QoL at 30 days (D30) and 180 days (D180) after the coronary event (n = 174)

VARIABLES	GROUPS	
	D30 (n = 86)	D180 (n = 88)
Sex, n (%)		
Male	48 (55.8)	50 (56.8)
Female	38 (44.2)	38 (43.2)
Age, mean ± SD (years)		
Male	56.4 ± 11.0	58.2 ± 10.3
Female	58.0 ± 11.9	63.6 ± 11.1
Total	57.1 ± 11.4	60.5 ± 10.9
QoL - SF-12, mean ± SD (score)		
Male	51.8 ± 7.4	51.3 ± 7.7
Female	45.7 + 9.6	48.1 ± 9.0
Total	49.1 ± 8.9	49.9 ± 8.4
Physical component, mean ± SD (score)		
Male	46.2 ± 10.4	45.9 ± 10.6
Female	42.0 ± 10.8	43.4 ± 10.5
Total	44.4 ± 10.7	44.8 ± 10.6
Mental component, mean ± SD (score)		
Male	57.3 ± 9.3	56.6 ± 9.2
Female	49.4 ± 12.2	52.8 ± 10.4
Total	53.8 ± 11.3	55.0 ± 9.9

SF-12: 12-item short form health survey; QoL: quality of life; SD: standard deviation.

QoL is associated with individuals' perception about their role in life, regarding the cultural context and value system, and to their objectives, expectations, standards and worries.[15] Such perception is hence individualized and non-transferable, and its evaluation after STEMI would allow the identification of difficulties faced by patients during rehabilitation. It is believed that STEMI can directly affect patients' lives, in terms of both socioeconomical and physical aspects, consequently influencing their work performance. This, in turn, causes a negative impact on interpersonal and financial relationships, and consequently on QoL perception.[16]

Altogether, these data may explain our results showing that at 30 days and 180 days after STEMI, patients have a poor QoL, which may also have been influenced by physical limitations of these individuals, including pain, limitations in household and work activities, difficulties in climbing stairs, among others. This is in line with results obtained from Thomas et al.,[17] who assessed AMI patients in outpatient care and observed satisfactory QoL in both control (seen in a conventional cardiology outpatient clinic) and intervention (referred to an outpatient clinic for secondary prevention of coronary artery disease) groups.

It is worth pointing out that the physical component of QoL may reflect issues related to the patient and the first clinical visit. It invites us to review the entire care chain of these patients, with special attention to a multidisciplinary approach to provide an educational program targeted to lifestyle changes and knowledge about the disease. This would lead to improvements in

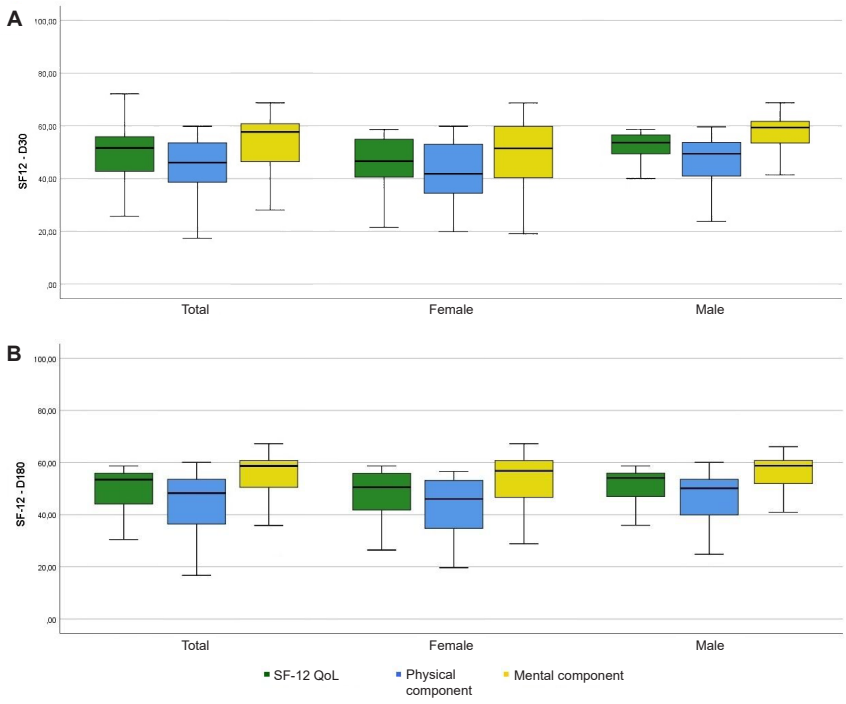

Figure 1 - Assessment of QoL and its physical and mental components in patients at 30 days (30 D) and 180 days (180D) after STEMI (n = 174)
A: Assessment of QoL in STEMI patients at 30 days after the coronary event; B: Assessment of QoL 180 days after the coronary event; SF-12: Short Form Health Survey; QoL: quality of life

cardiovascular rehabilitation, currently a rare modality of treatment in public health system.[18,19]

In addition to physical limitations, other risk factors for the development of AMI include unfavorable psychosocial conditions, like anxiety, stress, social isolation[20] and depression.[21] According to the American Heart Association, depression is responsible for worse cardiovascular outcomes.

Concerning the mental component of QoL, in our study, women showed satisfactory values at 180 days only, but still lower than those of men, which corroborates previous studies.[9,22,23] Serpytis et al.[9] assessed anxiety and depression after AMI and showed that women are at higher risk of developing anxiety and depression, compromising the QoL after the coronary event. Similar results were reported by Rafael et al.[22] who assessed patients hospitalized for cardiac rehabilitation after AMI. Figueiredo et al.[23] showed that women had a 3.5 times higher risk of developing depressive disorder than men.

It is important to highlight that, in the present study, data were collected during the COVID-19 pandemic, which may have negatively affected patient adherence to the study protocol. Pandemic restrictions had an impact on patients' daily lives, including reduced access to medical services,[24] which may have made it difficult for patients to return to their habits after the coronary event. Besides, with these restrictions, different methods for the questionnaire administration had to be developed, but several measures were used to minimize possible biases. Training of examiners, standardization of procedures and continuous monitoring of data collection were implemented to ensure consistency and quality of the results obtained.

Potential limitations of the study include difficulties in obtaining the signature of the consent form in person due to the COVID-19 pandemic restrictions; difficulties in contacting the patients for the interview, due to the lack of a telephone number and unanswered calls, and in performing a long-term QoL follow-up. Consequently, different groups were formed, making it difficult to draw statistical inferences and generalize the results. Not all patients completed the SF-12 at both time points (30 days and 180 days), which hampered comparison of results over time, collection of detailed information about the clinical course of patients, and consequently a more

comprehensive understanding of the outcomes and effects of the interventions over time. However, we believe that these limitations do not preclude the critical analysis presented in this study.

Conclusion

Our study population had a poor QoL at 30 days and 180 days after STEMI, with greater impairment of the physical component and worse perception among women than men at both time points.

Author Contributions

Conception and design of the research, writing of the manuscript and critical revision of the manuscript for intellectual content: Santos BM, Guimarães ISS, Avena KM, Paiva Filho IM, Roriz OS; acquisition of data: Santos BM, Guimarães ISS, Roriz OS; statistical analysis: Avena KM.

Potential Conflict of Interest

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

Sources of Funding

There were no external funding sources for this study.

Study Association

This study is not associated with any thesis or dissertation work.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of the Secretaria da Saúde do Estado da Bahia (SESAB) under the protocol numbe 58949416.7.0000.0052. All the procedures in this study were in accordance with the 1975 Helsinki Declaration, updated in 2013. Informed consent was obtained from all participants included in the study.

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