Clinical Investigations

Marital Status and Outcome of Patients Presenting with Acute Coronary Syndrome: An Observational Report

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ABSTRACT

Background & hypothesis: Data on the clinical characteristics and outcome of patients presenting with acute coronary syndrome (ACS) according to their marital status is not clear.

Methods: A total of 5334 patients presenting with ACS in 65 hospitals in 6 Middle East countries in the 2nd Gulf Registry of Acute Coronary Events (Gulf RACE-2) were studied according to their marital status (5024 married, 100 single, and 210 widowed patients).

Result: When compared to married patients, widowed patients were older and more likely to be female. Widowed patients were more likely to have diabetes mellitus, hypertension, history of heart failure, and peripheral vascular disease and were less likely to be tobacco users when compared to the other groups. Widowed patients were also more likely to present with atypical symptoms and have advanced Killip class. Widowed patients were more likely to present with non-ST-elevation myocardial infarction (NSTEMI) when compared to the other 2 groups. Widowed patients were more likely to have heart failure ($P = 0.001$), cardiogenic shock ($P = 0.001$), and major bleeding ($P = 0.002$) when compared to the other groups. No statistically significant difference was observed in regard to duration of hospital stay, door to needle time in STEMI patients, or cardiac arrhythmias between the various groups. Widowed patients had higher in-hospital, 30-day, and 1-year mortality rates ($P = 0.001$). Marital status was an independent predictor for in-hospital mortality.

Conclusion: Widowed marital status was associated with worse cardiovascular risk profile, and worse in-hospital and 1-year outcome. Future work should be focused on whether the provision of psychosocial support will result in improved outcomes among this high-risk group.

Introduction

Cardiovascular disease is the leading cause of morbidity and mortality globally and in the Middle East. Prognostic indicators based on illness severity are strong predictors of survival after acute myocardial infarction (MI). The U.S. Department of Health and Human Services indicates that married people are healthier than other adults, supported by the fact that married people had fewer limitations in daily activities and in physical or social functioning; they were less likely to suffer from severe psychological stress, to have a physically inactive lifestyle, to smoke, and to engage in heavy alcohol drinking.[1]

The association between marital status and short-term prognosis of patients hospitalized for acute coronary syndrome (ACS) had not been evaluated extensively. Few studies have suggested that patients with MI who lived alone or were unmarried were at increased risk for death.[2,3] Other studies have highlighted the significant role of psychosocial conditions in patients with MI.[4–8] Conventionally, several multivariable risk models have been developed to predict outcome among ACS patients using certain indicators including "traditional" risk factors to help physicians risk-stratify patients in a standardized uniform manner, such as the Global Registry of Acute Coronary Events (GRACE)

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and Thrombolysis In Myocardial Infarction (TIMI) risk scores. However, these risk models are limited by the fact that they do not take into account psychological factors such as depression, anxiety, and the social status of the patient. Making use of sociodemographic indicators included in the population standard registers may be of great importance. Even though this option has been largely uncharted as concerns cardiac prevention, ischemic heart disease occurrence is associated with a series of social indicators, especially low socioeconomic status, low educational level, and lack of social and psychological support[9–17]; some of the individuality may be represented in population registers, for example, age, sex, residence, and annual income. Despite the fact that social history including marital status of patients is routinely obtained among patients evaluated medically in general and specifically among cardiac patients, the significance of marital status of patients presenting with ACS has not been adequately evaluated.

The aim of the current study was to analyze the clinical presentation and outcome of patients presenting with ACS according to their marital status. We hypothesize that the clinical characteristics and outcome of ACS patients vary according to their marital status.

Patients and Methods

The data were collected from a 9-month prospective, multicenter study of the 2nd Gulf Registry of Acute Coronary Events (Gulf RACE) that recruited 7939 consecutive ACS patients from 6 adjacent Middle Eastern Gulf countries (Bahrain, Kingdom of Saudi Arabia, Qatar, Oman, United Arab Emirates, and Yemen) between October 2008 and June 2009. Patients diagnosed with ACS, including unstable angina (UA) and non-ST- and ST-elevation myocardial infarction (NSTEMI and STEMI, respectively), were recruited from 65 hospitals. The study was approved by local ethical committees and, being an observational study, only informed consent was taken from each subject before enrolling them into the study.

An on-site cardiac catheterization laboratory was available in 43% of the hospitals. There were no exclusion criteria, and thus, all the prospective patients with ACS were enrolled. The study received ethical approval from the institutional ethical bodies in all participating countries.[18] Diagnosis of the different types of ACS and definitions of data variables were based on the American College of Cardiology clinical data standards.[19]

A case report form (CRF) for each patient with suspected ACS was filled out upon hospital admission by assigned physicians and/or research assistants working in each hospital using standard definitions and was completed throughout the patient's hospital stay. All CRFs were verified by a cardiologist then sent online to the principal coordinating center, where the forms were further checked for mistakes before submission for final analysis. An enquiry about patients' survival at 1- and 12-month follow-up after discharge was also made.

Statistical Analysis

Descriptive statistics in the form of means and standard deviations (SDs) for continuous variables and frequencies and percentages for categorical variables were performed. One-way analyses of variance (ANOVAs) (parametric and nonparametric, wherever applicable) were performed to determine significant differences between continuous variables and marital status, and chi-square tests were used for categorical variables according to marital status categories. Multivariate logistic regression was used to estimate the association between marital status and outcomes adjusting for other important variables. Adjusted odds ratios (ORs) with 95% confidence intervals (CIs) were calculated from the multivariate analysis. A value of $P < 0.05$ (2-tailed) was used for statistical significance. All analyses were performed using the SPSS 19.0 Statistical Package.[20]

Results

The present analysis included 5334 patients who had their marital status documented; 5024 of patients were married, 100 were single, and 210 were widowed.

Baseline clinical characteristics are reported in Table 1. When compared to married patients, widowed patients were older and more likely to be females. Widowed patients were less likely to be smokers but were more likely to have diabetes mellitus (41.3% vs 38.2%, $P = 0.001$) and hypertension (56.7% vs 44.5%, $P = 0.001$). Widowed patients were more likely to have a past history of heart failure (24.8%) and peripheral vascular disease (6.2% vs 1.6%, $P = 0.001$). Moreover, widowed patients were more likely to present with atypical chest pain and dyspnea ($P = 0.001$). Furthermore, widowed patients are more likely to present with advanced Killip class and intermediate to high GRACE risk scoring when compared to married patients ($P = 0.001$).

In-hospital management and outcomes are reported in Tables 2 and 3. Widowed patients were more likely to present with non-ST elevation NSTEMI (33.8% vs 26.6%, $P = 0.05$) and less likely to undergo coronary angiography ($P = 0.001$).Widowed patients were more likely to have acute heart failure (24.8% vs 13.6%, $P = 0.001$), cardiogenic shock (16.7% vs 6.6%, $P = 0.001$), and major bleeding (2.4% vs 0.4%, $P = 0.002$) when compared to the other 2 groups. The length of stay and door to needle time were comparable among the various groups. Widowed patients had higher in-hospital (16.2% vs 4.9%, $P = 0.001$), 30-day (21% vs 8.9%, $P = 0.001$), and 1-year mortality rates (31.4% vs 13%, $P = 0.001$) (Table 3).

Single patients were younger (mean $\pm$ SD, 45 ± 18 years), more likely to be smokers, and less likely to have diabetes mellitus, hypertension, and dyslipidemia when compared to married patients. Single patients were less likely to present with advanced Killip class or high GRACE risk score (Table 1). In general, the single marital status group appeared to have less in-hospital complications, lower 30-day and 1-year mortality, with shorter hospital stay and better discharge ejection fraction than their married counterparts (Table 3).

Multivariate analysis showed that the widow status is independent predictor of in-hospital mortality after adjustment for baseline variables (Table 4).

Discussion

The current study suggests that the clinical characteristics and outcome of ACS patients vary according to their

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Table 1. Baseline Demographics and Clinical Characteristics for Patients According to their Marital Status

Variable	Married (n = 5024)	Single (n = 100)	Widowed (n = 210)	*P*
Age (years), (mean ± SD)	56.5 ± 12	45 ± 18	69 ± 11.5	0.001
Female gender	974 (19.4%)	16 (16%)	129 (61.4%)	0.001
Body mass index (kg/m²), (mean ± SD)	26.6 ± 5.6	26.5 ± 5.5	25.8 ± 6	0.12
Current smokers	2817 (56.1%)	71 (71%)	69 (32.9%)	0.001
Previous angina	1852 (36.9%)	29 (29%)	83 (39.5%)	0.50
Previous MI	878 (17.5%)	20 (20%)	47 (22.4%)	0.18
Previous PCI	385 (7.7%)	9 (9%)	21 (10%)	0.47
Previous CABG	174 (3.5%)	0 (0%)	8 (3.8%)	0.41
Diabetes mellitus[a]	1891 (38.2%)	16 (16%)	85 (41.3%)	0.001
Hypertension[b]	2212 (44.5%)	35 (35%)	118 (56.7%)	0.001
Hyperlipidemia[c]	1386 (31.1%)	19 (19%)	53 (26.6%)	0.07
Family history of CAD	470 (9.4%)	6 (6%)	12 (5.7%)	0.13
Previous heart failure	683 (13.6%)	10 (10%)	52 (24.8%)	0.001
Atrial fibrillation	103 (2.1%)	2 (2%)	6 (2.9%)	0.72
Renal failure	172 (3.4%)	2 (2%)	12 (5.7%)	0.16
Peripheral arterial disease	82 (1.6%)	1 (1)	13 (6.2%)	0.001
At presentation				
Presentation >12 hours	793 (64.2%)	13 (72.2%)	51 (69.9%)	0.49
Typical ischemic chest pain	4230 (84.1%)	90 (90%)	150 (71.4%)	0.001
Atypical chest pain	247 (4.9%)	4 (4%)	12 (5.7%)	
Dyspnea	362 (7.2%)	4 (4%)	29 (13.8%)	
Killip class				0.001
I	3821 (76.1%)	80 (80%)	124 (59%)	
II	250 (14.9%)	13 (13%)	51 (24.3%)	
III	268 (5.3%)	3 (3%)	14 (6.7%)	
IV	185 (3.7%)	4 (4%)	21 (10%)	
Heart rate (beats/min) (mean ± SD)	85 ± 20	87 ± 20	83 ± 20	0.21
Systolic blood pressure (mm Hg), (mean ± SD)	133 ± 29	132 ± 26	129 ± 34	0.08
Diastolic blood pressure (mm Hg), (mean ± SD)	81 ± 17	83 ± 16	76 ± 22	0.001
GRACE risk score				0.001
Low	3389 (67.5%)	75 (75%)	81 (38.6%)	
Intermediate	1202 (23.9%)	19 (19%)	83 (39.5%)	
High	355 (7.1%)	4 (4%)	39 (18.6%)	

CABG, coronary artery bypass graft; CAD, coronary artery diseases; GRACE, Global Registry of Acute Coronary Events; MI, myocardial infarction; PCI, percutaneous coronary intervention, SD, standard deviation. Data are expressed as mean ± SD or as number (percentage). [a]Patient had been informed of the diagnosis by a physician before admission and was undergoing treatment for type 1 or 2 diabetes. [b]Systolic blood pressure >140 mm Hg, diastolic blood pressure >90 mm Hg, or current antihypertensive treatment. [c]Total cholesterol >6.1 mmol/L, low-density lipoprotein >4.1 mmol/L, or high-density lipoprotein <0.9 mmol/l; triglycerides >200 mg/dL; or current use of lipid-lowering agent.

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Table 2. Medication Received Before Admission, During Admission, and At Discharge

	Before Admission				During Admission				At Discharge			
Medications (%)	Married (n = 5024)	Single (n = 100)	Widowed (n = 210)	P	Married (n = 5024)	Single (n = 100)	Widowed (n = 210)	P	Married (n = 5024)	Single (n = 100)	Widowed (n = 210)	P
Aspirin	38.1	35.4	52.7	0.001	98.3	98	97.6	0.72	95.2	92.8	86.9	0.001
β Blockers	25.8	23	27.6	0.68	71.8	76	55.7	0.001	77.1	75	60	0.001
Clopidogrel	10.9	13	10.5	0.78	76.7	82	65.2	0.001	68.9	68	51.9	0.001
ACE inhibitors	24.1	22	38.6	0.001	70.2	69	70.5	0.96	71.3	69	65.7	0.20
GPIIb/IIa inhibitors					6.6	7	6.2	0.96				
Unfractionated heparin					44	46	55.7	0.004				
Thrombolytic therapy					47.4	60.9	24.4	0.001				
Enoxaparin					36.2	38	31.4	0.35				

ACE, angiotensin-converting-enzyme; GP, glycoprotein.

Table 3. Presentation, Treatment, and Outcomes of Patients According to their Marital Status

Variable	Married (n = 5024)	Single (n = 100)	Widowed (n = 210)	P
Discharge diagnosis				
STEMI/new LBBB	2546 (50.7)	50 (50)	95 (45.2)	0.05
NSTEMI	1338 (26.6)	20 (20)	71 (33.8)	
Unstable angina	1140 (22.7)	30 (30)	44 (21)	
Coronary angiography	1512 (30.1)	30 (30)	34 (16.2)	0.001
Elective PCI	487 (9.6)	7 (7)	14 (6.6)	0.10
Urgent/emergency PCI (UA/NSTEMI)	199 (3.7)	5 (5)	1 (0.47)	
Creatinine (μmol/L)	107 ± 88	121 ± 168	121 ± 126	0.12
Hospital complications				
Recurrent ischemia	851 (16.9)	15 (15)	52 (24.8)	0.01
Re-infarction	120 (2.4)	2 (2)	6 (2.9)	0.88
Congestive heart failure	683 (13.6)	10 (10)	52 (24.8)	0.001
Cardiogenic shock	331 (6.6)	1 (1)	35 (16.7)	0.001
Major bleeding	20 (0.4)	0 (0)	5 (2.4)	0.002
Predischarge echocardiogram (EF< 30)	319 (7.6)	3 (3.4)	20 (11.6)	0.08
Hospital stay (days)	6 ± 6	5 ± 4	7 ± 6	0.01
Door to needle time	65 ± 109	75 ± 151	53 ± 65	0.90
Arrhythmias	25 (0.5)	1 (1)	2 (1)	0.53
Mortality				
In-hospital	247 (4.9)	4 (4)	34 (16.2)	0.001
30-day	385 (8.9)	5 (5)	41 (21)	0.001
1-year	503 (13)	7 (9.1)	55 (31.4)	0.001

EF, ejection fraction; LBBB, left bundle branch block; LVEF, left ventricular ejection fraction; NSTEMI, non-ST-elevation myocardial infarction; PCI, percutaneous coronary intervention; STEMI, ST-elevation myocardial infarction; UA, unstable angina. Data are expressed as n (%) or mean ± SD.

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Table 4. Multivariate Analysis for In-Hospital Mortality

	Adjusted Odds Ratio	95% Confidence Interval	*P*
Age	1.03	1.02–1.04	0.001
Gender male	1.08	0.77–1.54	0.65
Body mass index	1.01	0.98–1.03	0.95
Diabetes mellitus	0.98	0.73–1.31	0.87
Hypertension	0.80	0.59–1.08	0.14
Smoking	0.80	0.59–1.09	0.16
Hyperlipidemia	0.60	0.42–0.84	0.003
Killip class >1	2.06	1.49–2.86	0.001
Previous heart failure	5.28	3.82–7.30	0.001
Marital status			
Married	1.00		
Single	1.35	0.46–3.99	0.59
Widowed	1.97	1.23–3.18	0.01

marital status. Widowed patients were older and had worse clinical characteristics when compared to married patients. Furthermore, widowed status was an independent predictor of worse outcome. This worse outcome may in part be attributed to lack of social support as well as the psychological stress and/or deprivation associated with widowed status. Unfortunately, the utility of marital status as a surrogate for worse outcome among ACS patients has been overlooked in the majority of studies and has been addressed only in a few studies (Table 5). The current study suggests the urgent need to study this association and whether formal psychological evaluation and management as well as the provision of social support will result in improved outcome.

In the Arab Middle East, there are certain unique social habits that are rarely existent in the developed world. In the Arab culture, parents are responsible for children well into those children's adult lives and not uncommonly marriage is prearranged by parents even in the current era. Children in return attempt to take responsibility for the care of their aging parents in their residence and it is not uncommon for 3 generations of the same family to be residing in the same house. These unique social behaviors may provide support to ailing adults, especially when they become widowed. Such behaviors may give this part of the community better social and psychological support, especially during the acute illness, but still we see higher short-term and long-term mortality in widowed patients than among married and single patients, even after adjustment for baseline variables; it might be hypothesized that this worse outcome is attributed to the psychological and emotional status of the widowed patients.

Marriage has long been known to offer health benefits[22,23] and is associated with a lower risk of death[24,25] relative to not being married. Marital status and cumulated marital periods, especially cumulated periods divorced/widowed are strong independent predictors of mortality among younger Danish males.[26] However, the specific mechanisms responsible for the lower rate of cardiovascular deaths in married persons[27] are not very well known. The current study complements the findings from the very limited studies published previously, which were limited by the fact that they compared married to single patients, and single patients included different subsets of patients, including single, widowed, and divorced (Table 5). Evaluating 192 patients with MI, Berkman et al[28] showed that lack of emotional support among the elderly was associated with increased mortality; this study finding may suggest that the worse outcome among the widowed patients in our study may be attributed to lack of emotional support, keeping in mind that the psychological status assessment such as depression and anxiety was not curried out routinely on admission in the current study in this part of the world.

As a substudy of the INTER-HEART study in China, Hu et al[29] investigated the effects of marital status and education on the risk of MI in 2909 cases and 2947 controls from 17 cities in China. Being single was consistently associated with an increased risk for acute MI, particularly in women. Several psychological factors were closely associated with such increased risk among the Chinese population. Psychological stress had a greater acute MI risk in men but depression was more significant among women.[30]

Data from the Middle East (Lebanon), through a retrospective 10-year follow-up study (1984–1994) among 1567 adults age 50 years and older found that widowhood was associated with an increased risk of all-cause mortality among men only; being never married was associated with a higher cardiovascular mortality risk among men and women. The presence of an adult married child was linked with a considerably higher mortality risk for men and women, even after adjusting for household socioeconomic indicators, marital status, lifestyle variables, or preexisting health-related conditions (hypertension, cholesterol, and diabetes) at baseline[31]; such a result may reflect some aspects of compatibility with our result in the current study.

A nonconcurrent prospective study conducted in metropolitan Baltimore, MD, examined the influence of marital status on the in-hospital and long-term survival rate of 1401 patients who experienced MI. The findings of the study indicated that married men and women who experience acute MI had a significantly better survival prospect, both in-hospital and after discharge, independent of other factors[32]; again, this result is concordant with the current study. Two studies from Greece evaluated the association between marital status and short-term prognosis of patients hospitalized for ACS. Panagiotakos et al[33] studied this association among 2172 patients (76% were males). Never-married patients had a 2.8 times higher risk of dying during hospitalization compared with married patients, after adjusting for various confounders ($P < 0.01$, attributable risk = 64%). Furthermore, never-married patients had a 2.7 times higher risk of dying during the first 30 days. This study may be compatible with our current study applied for widowed patients but discordant for younger single patients. The CARDIO2000 study was a matched case-control study consisting of 750 patients with a first event of ACS selected from several regions in Greece. The interaction with marital status increased the previous risk by 167% in divorced/widowed men, and by 123% in women.[34] In a another study from the United Kingdom, people who were

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Table 5. Studies on Marital Status in Correlation with Acute Coronary Syndrome/Stable Coronary Artery Disease

Author/year	Study	Country	Patients (n)	Follow-up	Age (years)	Conclusion
Hadi Khafaji et al. (this study)[a]	Retrospective analysis of prospectively collected data/Gulf RACE-2	6 Middle Eastern states	5334 with ACS	1 year	69 ± 11.5 vs 56.5 ± 12	Widowed marital status associated with ▲ CV risk profile, ▲ in-hospital complication, and ▲ in-hospital, 30-day, and 1-year mortality ($P = 0.001$); OR, 1.92; 95% CI, 1.21–3.03
Perkins et al.[34] (2009)[a]	Prospective study	United Kingdom	228 with ACS	Prehospital	59.0 ± 11.2	Marriage has supportive effect in acute cardiac patients through shorter total prehospital delays
Panagiotakos et al[33] (2008)[a]	GREECS; retrospective analysis of prospectively collected data	Greece	2172 with AMI; 76% were men	In-hospital and 30-day	65 ± 12 vs 74 ± 12	Unmarried patients had 2.8 times ▲ risk of in-hospital mortality vs married, $P < 0.01$ adjusted for various confounders (attributable risk = 64%); unmarried had 2.7 times ▲ 30-day mortality
Nielsen et al.[50] (2006)[a]	Prospective study	Denmark	646 with ACS	April 2000 to March 2002	30–69	Women >60 years and men >50 years living alone are at ▲ risk of ACS. Constitute 5.4% and 7.7% of population and had 30 days = 34.3% and 62.4% of ACS patients, respectively.
Panagiotakos et al[35] (2001)[a]	CARDIO2000; matched case-control study	Greece	750 with first ACS	8-month study of in-hospital mortality	Men: 587 ± 14; Women: 64.5 ± 7	Interaction with marital status ▲ risk of nonfatal ACS by 167%, in divorced/widowed men and by 123% in women ($P = 0.001$); OR, 1.07; 95% CI, 0.89–1.94
Chandra et al.[32] (1983)[a]	Nonconcurrent prospective study	Baltimore, MD	1401 with AMI	10 years of follow-up	Not given	AMI patients discharged alive had better survival rate for the married vs unmarried for both males ($P < 0.0001$) and females ($P < 0.025$)
Hu et al[29] (2012)[b]	INTER-HEART case-control study	China	2909 cases and 2947 controls	13-year study	62.11 ± 11.72	Single marital status consistently associated with ▲ risk for AMI, particularly in women
Gerward et al[36] (2010)[b]	Population-based cohort	Sweden	33,224 subjects	22.5 ± 6.2 years	27–61	Short-term case fatality rate related to unmarried status in men and women. HR, 1.10, 95% CI, 0.97–1.24; HR, 1.42, 95% CI, 1.27–1.58; HR, 1.77, 95% CI, 1.31–2.40. Not explained by biological, lifestyle, or occupational level.
Sibai et al[31] (2007)[b]	Retrospective 10-year study 1984–1994	Lebanon	1567 adults age ≥50 years	10-year retrospective study	≥ 50	Presence of an adult married child associated with significantly ▲ mortality risk for men and women

ACS, acute coronary syndrome; AMI, acute myocardial infarction; CI, confidence interval; CV, cardiovascular; HR, hazard risk; OR, odds ratio [a]Acute coronary syndrome study. [b]Stable coronary disease study.

not married and depressed at the time of an acute cardiac episode were at higher risk of fatal events than people who were married, irrespective of depression status and other characteristics. Marriage may have a supportive beneficial effect in acute cardiac patients through shorter total prehospital delays and decision times associated with STEMI.[35]

In a Swedish population-based cohort of 33,224 subjects, investigators evaluated the risk of future cardiac events; the investigators demonstrated that the short-term case fatality rates were significantly related to unmarried status in men and women. After risk-factor adjustments, unmarried status in men, but not in women, was notably associated with increased risk of suffering a cardiac event. Unmarried status in both genders was related to an increased case fatality rate (first day). This relationship was not explained by biological or lifestyle factors or occupational level.[36] Again, this study may be compatible with our current study, for widowed patients but discordant for younger single patients, considering that the current study did not look for the divorced marital status. There are also studies implying that low-grade systemic inflammation could contribute to the increased cardiovascular risk found in manual workers and divorced men.[37]

The exact cause of poor outcome among widowed patients is unknown, but there are several possible explanations. Patient delay in seeking care has been found to be associated with living alone, which may influence the proportion being treated with thrombolysis and invasive cardiac procedures.[38] There is also a possibility for higher prevalence of other diseases among unmarried patients, which might affect survival. Social support is intimately linked to marital status and the social support offered by marriage seems to exert a protective effect at least for men, in reducing incidence and case fatality rates after coronary artery disease.[39,40]

The impact of high-level psychological distress,[41] low-level social support,[42–46] low-level psychological support,[47] preexisting depression,[48] sleep disturbance,[49] living alone[50] (Table 5), and grief over the death of a significant person[51] is associated with deleterious outcome in ACS patients; such associated aspects may have great impact in widowed ACS patients and are usually overlooked by physicians during daily practice; even in history-taking such aspects of systematic family history[52] should be looked for carefully, in our opinion especially in future ACS registries. If analyzed carefully, the widowed marital status may be an independent risk factor for poor outcome in the setting of ACS. From the above, we can see clearly as physicians that marital status (specifically the widowed, who may have underlying social and psychological and personal issues) had great impact on cardiac patients both in the acute stage and as a risk factor. In clinical practice we need to keep in mind such association when planning the management; a multidisciplinary team working together with the psychiatrist and social support team may have beneficial effect on the management of this group of ACS patients.

Study Limitations

Our data were collected from an observational study. The fundamental limitations of observational studies cannot be eliminated because of the nonrandomized nature and unmeasured confounding factors. However, compared with the results of randomized controlled trials, well-designed observational studies provide valid results and do not systemically overestimate results. Our study also did not assess the impact of psychosocial status according to marital status in these patients. Finally, the divorced marital status was not looked for in the current study and would need to be evaluated in future studies. Finally, the number of single and widowed patients in the current study is low when compared to married patients, and the findings in the current study need to be confirmed in future studies that include larger numbers of single, widowed, and divorced patients.

Conclusion

Widowed marital status was linked with a higher cardiovascular risk profile, and higher in-hospital and 1-year mortality outcome. Future work should be focused on whether the provision of psychosocial support will result in improved outcome among this high-risk group.

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