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Comparison of Personal Characteristic of Patients Affected By Broken Heart Syndrome and Acute Coronary Syndrome Vs. Healthy Subjects

Research Article

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Abstract

Background and purpose: There is a joint link between somatic disorders and psychological stresses. Since presence of underlying special psychological characters predispose persons to development of broken heart syndrome (BHS), we aimed to find out predisposing personal characteristics and their difference between cases with BHS, acute coronary syndromes and healthy subjects.

Methods and subjects: This case-control study was performed on 60 cases with diagnosed broken heart syndrome, 60 cases of acute coronary syndrome and 60 healthy subjects. All enrolled participants filed appropriate questionnaires after getting signed informed consent. Data were analyzed using SPSS ver.12 via MANOVA test.

Principal results: There was a significant difference in all three groups regarding psychosis ($P<0.01$), aggression and phobia ($P<0.05$). These characteristics were higher in cases with broken heart syndrome than cases with acute coronary syndrome and healthy subjects.

Principal conclusions: Joint link between psychological factors and broken heart syndrome emphasizes on behavioral therapies and psychological treatments for healing this entity.

Keywords: Personality Characteristics; Broken Heart Syndrome; Acute Coronary Syndrome.

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Introduction

According to the bio-psychological model (biology- psychology-social template), there is a joint link between psychological and somatic factors, in human being. Despite of the biologic heritage, personality factors lead to some somatic reactions [1]. There is a great emphasize on the relationship between somatic disorders and psychosocial disorders. Psychological stresses impose great burden on cardiovascular diseases as a leading cause of death, worldwide. Clinical investigations and observational studies imply the role of psychological factors on the development and progression of cardiovascular diseases [2]. Among these cardiovascular diseases, broken heart syndrome (BHS) is an entity that occurs due to dysfunction of myocardial performance by a severe physical or psychological stressgen factor [3]. Stress –induced cardiomyopathy is often but not always triggered by an intense emotional or psyshological stress (as domestic abuse, arguments, devasting financial losses, natural disasters, death of relatives and so on) and or acute medical illness [4 - 8].

There is a major difference between BHS and acute coronary syndrome [2]. Angiographic data from these patients demonstrate normal patent coronary arteries without any elevation in cardiac biomarkers. A rapid reversal to normal conditions (about 2 weeks) has been seen in these cases with complete recovery [9 - 11]. But presence of chest pain and dyspnea mimics acute coronary events in emergency department [10]. It should be noted that in about one third of patients manifest with pulmonary congestion, arrhythmia and even elevated cardiac biomarkers [9]. These manifestations are often transient and brief. Cardiac biomarkers are much lower in these cases than patients with acute coronary events [9].

Anyway, personality characteristics are relatively stable but could change according to environmental factors [12]. Imbalance in personal characteristics progresses to the development of a syndrome and finally psychological disorders. It has been suggested that persons with certain psychological characters are susceptible

to specific somatic disorders [13]. BHS is not considered as acute coronary syndrome and differs principally from conversion disorder[14]. BHS with prevalence of about 2% is a psycho-somatic disorder with physiological manifestations of an unwanted emotional condition [15]. 80% of these cases are women with mean range of 60 years old [16]. The key feature of BHS is occurrence of an acute physical or psychological stressgen event [17]. The diagnosis should be suspected in postmenopausal women presenting with acute coronary symdrome after intense psychological stress and ECG changes out of proportion to the degree of cardiac biomarker elevation[10]. Although, the majority of these symptoms subsides or vanishes after 3 weeks, but applying supportive cares could be used to accelerate therapeutic process [16]. Indeed, administration of medicines as angiotensin-converting enzymes (ACEI) and beta blockers till disappearance of symptoms is valuable.

The relationship between personal characteristics and BHS and its occurrence in persons older than 45 years old and post-menopausal women seek paying more attentions to the diagnosis of this syndrome to avoid diagnostic mistakes [18]. Since presence of underlying special psychological characters predispose persons to development of this syndrome , we aimed to find out predisposing personal characteristics and their difference between cases with BHS, acute coronary syndromes and healthy subjects.

Materials and Methods

Among 2000 cases with stress induced chest pain, patients with negative mild increased cardiac biomarkers, but normal coronary angiography and non-specific electrocardiographic changes, 60 cases were enrolled randomly in the group of BHS [19]. Indeed, among 3000 cases with chest pain, 60 patients with physician diagnosis of acute coronary syndrome were enrolled in the group of acute coronary syndrome. Third group, were 1000 healthy subjects (according to WHO criteria) without signs and symptoms of BHS and acute coronary syndrome after matching with patients regarding demographic characteristics (age, gender, inhabitant, education and occupation). Sample volume of whole participants was evaluated to be 180 cases. Thus, in each group 60 cases were selected using simple random sampling based on the similarity in demographic characters. All participants enrolled in this investigation after getting signed informed consent.

SCL-90-R questionnaire: This 90-item quality was designed by Frank et al and measures depression, anxiety, paranoia, obsession, psychosis, stress in personal relationships, aggressiveness and hypochondriasis. Validity and reliability of this questionnaire was confirmed in Iranian population which showed high validity and reliability [20]. Investigator based modified SCL-90-R was constructed with 7 included questions. Kuder Richardson coefficient was used to evaluate its validity. In order to achieve consistency between data, derived scores from two tests with one month interval between them, on pilot cases were calculated and showed to be 66%. Filled questionnaire were gathered and data were analyzed using SPSS ver.12 through MANOVA test.

Results

Demographic data of all cases are included in table-1. Gathered data from filled questionnaires are included in table-2 as mean ± SD. Phobia and paranoia parameters were highest and lowest in BHS groups, respectively. Indeed, in cases with acute coronary syndrome, anxiety and psychosis parameters were highest and lowest, respectively. In order to match SD in three groups for items of questionnaire, Levin test was used. As depicted in Table-3, the pre-test probability of equalization of SD for all items of questionnaire is confirmed ($P<0.05$). In table-4, MANOVA test was used to compare items of questionnaires after adjustment for confounders. Our data demonstrate that there is no significant inter group difference regarding depression, paranoia, obsession, hypochondriasis and inter-personal relationship ($P>0.05$).

Table 1: Frequency distribution of cases and their demographic data

Groups	Gender				Total
	Single	Married	Single	Married	
BHS	10	36	4	10	60
CAD	10	16	18	26	60
Healthy	18	24	11	17	60
Total	38	76	33	43	180

Table 2: Descriptive statistics of Scl-90-R

Groups		Depression	Hypochondriasis	Psychosis	Anxiety	Obsession	Sensitivity	Phobia	Aggression	Paranoia
BHS	Mean	1.46	1.35	1.38	1.44	1.42	1.32	1.48	1.31	1.29
	SD	0.97	0.86	1.1	0.99	0.98	0.92	1.01	1.02	0.94
CAD	Mean	1.2	1.24	0.91	1.27	1.07	1.05	1.05	0.95	1.11
	SD	0.9	0.83	1.01	0.91	0.9	0.94	0.94	0.07	0.95
Healthy	Mean	1.17	1.17	0.87	1.27	1.14	0.95	0.91	0.83	0.95
	SD	0.95	0.89	0.85	0.98	0.85	0.85	0.84	0.79	0.78

Table 3: Levin test for equation of Scl90 scales

Variables	F	dF1	dF2	P
Depression	0.9	2	177	0.4
Hypochondriasis	0.36	2	177	0.69
Psychosis	1.69	2	177	0.07
Anxiety	0.79	2	177	0.45
Obsession	1.46	2	177	0.23
Sensitivity	1.76	2	177	0.17
Phobia	1.98	2	177	0.14
Aggression	1.52	2	177	0.11
Paranoia	1.08	2	177	0.09

Table 4: Manova test for Scle-90-r scales in groups

Variables	MS	dF1	F	P
Depression	1.52	2	1.712	0.18
Hypochondriasis	0.44	2	0.654	0.52
Psychosis	4.94	2	4.988	0.00
Anxiety	0.56	2	0.598	0.55
Obsession	2.00	2	2.369	0.09
Sensitivity	2.23	2	2.671	0.07
Phobia	3.44	2	3.916	0.02
Aggression	3.82	2	4.259	0.01
Paranoia	2.71	2	2.11	0.12

Table 5: Comparison of mean values of variables between groups

Variables		Groups	Mean	SE	P
Psychosis	BHS	1.38	0.47	0.18	0.01
	CAD	0.91	0.51	0.18	0.005
	Healthy	0.86	0.04	0.18	0.8
Phobia	BHS	1.48	0.33	0.17	0.05
	CAD	1.05	0.46	0.17	0.007
		0.91	0.13	0.17	0.43
Aggression	BHS	1.31	0.36	0.17	0.006
	CAD	0.95	0.12	0.17	0.48
		0.83	0.12	0.17	0.48

But psychosis (P<0.01) and aggressiveness/phobia parameters (P<0.05) showed to have significant difference between groups. Table-5 depicts the mean value of psychosis, aggressiveness and phobia between groups according to comparison of means. Our data demonstrate that mean values of psychosis, phobia and aggressiveness are higher in BHS cases than others (P<0.01). But values of this parameter showed no significant difference between acute coronary syndrome cases and healthy subjects (P>0.05).

Discussion

The main finding of our survey is higher prevalence of phobia and aggressiveness among patients with BHS compared with acute coronary syndrome and healthy subjects. Other parameters as depression, hypochondriasis, anxiety, obsession, paranoia and inter-personal stress showed non-significant difference between groups. Indeed, no difference was seen between cases with acute coronary syndrome and healthy subjects regarding phobia, psychosis and aggressiveness. Therefore, it could be concluded that psychosis, phobia and aggressiveness are associated with BHS. Denolt et al noted that aggressiveness and phobia could predispose persons to BHS, while Prasad et al and Sharkey et al relates fears and phobia to susceptibility for BHS, which is compatible with our findings [21-23]. Anyway, our data emphasize on the role of psychological parameters on development of BHS. Cases with BHS are in unhealthier state regarding psychosis, phobia and aggressiveness compared with other people even cases with acute coronary syndrome. Interestingly, in our survey there was no difference between cases with acute coronary syndrome and healthy subjects regarding personal characters which is controversial finding with previous reports. Compare A et al have considered type D personality as a risk factor for development of stress induced cardiomyopathy [24]. Atkinson et al (1985) and Friedman and Rosenman (1979) showed interaction between personal characteristics and acute coronary syndrome [25-26]. Thus, it could be concluded that in the present situation of our society, personal characteristics might no longer predict development of acute coronary syndrome, but it could be expected that with increased rate of aggressiveness, psychosis and phobia the prevalence of psychosomatic disorders as BHS would be increased. Thus, cases affected with BHS should be aware about this interaction. In this case, public education and informative workshops should be established. The role of psychologists in emergency departments should be more prominent. Indeed, an update overview on the relationship between type A personality character and acute coronary syndrome should be performed.

Conclusions

Joint link between psychological factors and broken heart syndrome emphasizes on behavioral therapies and psychological treatments for healing this entity.

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