ORIGINAL ARTICLE

Personality Traits, Anxiety and Depression in Post-Myocardial Infarction Patients

SYED IMRAN ALI SHAH¹, MIRZA ZEESHAN SIKANDAR², AIMAN FATIMA², INAMUL HAQ⁴.

¹Department of Biochemistry, University of Hafr Al-Batin, Hafar Al Batin, Saudi Arabia.

^{2,3}Department of Biochemistry, Central Park Medical College, Lahore, Pakistan.

⁴Department of Physiology, University of Hafr Al-Batin, Hafar Al Batin, Saudi Arabia.

Correspondence to Dr. Syed Imran Ali Shah, Email: simranali@uhb.edu.sa / s.shah10@alumni.imperial.ac.uk, Phone: +966534510690

ABSTRACT

Objective: Personality types are known to influence the risk for cardiovascular diseases (CVDs) including myocardial infarction (MI). Individuals with Type A personality are highly driven while those with Type B are relaxed and easy going. Type D personality is another personality type in which people tend to be insecure, irritable and anxious. The aim of the study was to determine the personality types of hospitalized MI patients and find correlation between personality types and negative psychological traits.

Methods: The cross-sectional study of post-MI hospitalized patients (n=300) used Rosemann-Friedman Personality Assessment (RFPA) and Type D scale 14 (DS-14) for personality assessment. Hospital Anxiety and Depression Scale (HADS) was employed for evaluating anxiety and depression. Based on RFPA scores, subjects were grouped as; Group 1 (Type B personality), Group 2 (Balanced personality) and Group 3 (Type A personality). One-way ANOVA was employed to assess mean differences between groups. Pearson correlation was used to assess correlation of psychological parameters and personality types.

Results: Type D personality is very common (98%) in patients with MI. Post-MI patients having type A personality show significantly higher scores of social inhibition (p=0.001), negative affectivity (p=0.000), anxiety (p=0.001) and depression (p=0.000). All the studied parameters showed significant positive correlation with type A personality.

Conclusion: Post-MI patients having type A personality are more prone to anxiety, depression, social inhibition and negative affectivity. Personality assessment and counselling may be beneficial in clinical management of these patients.

Keywords: Myocardial infarction, Personality, Anxiety, Depression

INTRODUCTION

Myocardial infarction (MI) is a potentially lethal acute emergency condition characterized by systemic and cellular changes induced by ischemia of the myocardial tissue ^[1]. MI affects more than seven million people globally every year. In the United States of America alone, it accounts for one and a half million cases annually with a high incidence rate of 600 per hundred thousand ^[2]. Certain psychological traits such as personality type have been implicated as risk factors in the development of MI. Personality embraces the dynamics of behavioral, emotional and cognitive patterns that evolve from environmental and biological factors. Distinctive differences in thought processes, feelings as well as behaviors lead to characteristic responses generated in individuals regarding sociability and irritability. These responses trigger metabolic derangements that can consequently predispose to clinical disorders [3].

There is a preponderance of cardiovascular diseases (CVDs) including atherosclerosis, hypertension and MI in individuals with certain personality types. Traditionally, personalities are referred to as Type A being highly driven or Type B being relaxed and easy going ^[4]. Another nomenclature in the personality types is Type D where D stands for distressed. Type D people tend to be insecure, irritable and anxious. They are more inclined toward apprehension about things going wrong rather than looking at the bright side of things.

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They tend to make extra effort to please people, and in doing so, they sometime avoid speaking their mind out resulting in an inhibited and tense attitude around others [5]. Type D personalities have hyperactive immune systems leading to enhanced inflammatory response, greater damage to blood vessels, increased blood pressure and eventual atherosclerosis, arteriosclerosis and thromboembolic complications [6]. Individuals with type D personality exhibit a higher degree of depression, anxiety and poor social connections, each of which is positively correlated with CVDs having marked higher levels of Creactive protein (CRP) and interleukin-6 (IL-6) making them prone to inflammatory reactions [7-9]. Assessment of psychological traits and personality types can help identify people at higher risk of CVDs including MI. The present study was aimed at finding the distribution of various personality types in post-myocardial infarction patients and exploring differences in adverse psychological traits between different personality types.

MATERIALS AND METHODS

A cross-sectional study was employed to evaluate the types of personality of post-MI patients and their impact on development of anxiety and depression. The study was conducted at University of Hafr Al-Batin, Hafar Al Batin, Saudi Arabia in collaboration with Central Park Medical College, Lahore, Pakistan from January 2020 to June 2020. The work was completed in accordance in accordance with the ethical standards of the Helsinki Declaration (1964, amended most recently in 2008) of the World Medical Association. Approval for the study was granted by the institutional research committee (Ref: Cardiac Health/2020). Patients (n=300), both males and females, with an age range of 45-65 years were recruited for the study after obtaining written informed consent. Hospitalized patients with a recent history of MI (between one to five days of the acute attack of MI) were recruited for the study. Patients with a history of kidney and/or liver disease were excluded.

Personality types were assessed using two different sets of well-established and validated scales. The patients gave their responses in the presence of a member of the research team who ensured adequacy of filling in the questionnaires. Rosemann-Friedman Personality Assessment (RFPA) was used to segregate individuals into type A, balanced personality or type B personality while Type D scale 14 questionnaire (DS-14) was used for identification of type D individuals. Use of these distinct scales allowed for transparency and better evaluation of the personalities of the study subjects. RFPA scores below 70 suggest type B personality, scores between 71 to 100 indicate balanced (mixed) personality and scores above 100 reflect type A personality ^[10]. The study subjects were segregated into three groups based on RFPA scores; Group 1 (Type B personality, n=93), Group 2 (Balanced personality, n=99) and Group 3 (Type A personality, n=108) (Figure 1).

DS-14 scale is a 14-item personality instrument that allows the subjects to rely on their own impression of themselves and rate themselves on a scale from 0 to 4 upon each of the 14 questions. It is comprised of two parameters namely social inhibition and negative affectivity, indicating the inability to interact and socialize as well as behaviors and attitudes causing disturbance in relationships respectively ^[11]. Scores of 10 or higher on both negative affectivity and social inhibition scales indicate type D personality ^[12].

Additionally, Hospital Anxiety and Depression Scale (HADS) was administered. HADS is a psychological tool used to determine levels of anxiety and depression in patients with physical conditions. It is a 14-item scale where seven of the items are related to depression and others are related to anxiety indicating score between 0 to 7 as normal levels, 8 to 10 as borderlines categorization of anxiety and depression and score above 10 suggests higher levels of anxiety and depression among the patients ^[13].

Anonymized data were entered into Statistical Package for Social Sciences (SPSS) version 23 and checked doubly for errors. Descriptive data were presented in the forms of frequencies and percentages. Following the assessment for normality of data, numerical data were presented as means + SD. Grouping of the data was done based on RFPA personality traits and one-way analysis of variance (ANOVA) was employed for determining statistical significance of the group differences on the studied parameters including scores of negative affectivity, social inhibition, anxiety and depression. Post-hoc Tukey's analysis was done to assess the differences between groups. ANOVA was employed to among the groups based on scores of RFPA. Pearson correlational analysis was employed on aforementioned factors for their relationship with type A personality. Regression analysis was done and receiver operating characteristic (ROC) curves were drawn to compare the left or right shift indicative of changes in factors for the personality variations. A p-value of less than 0.05 was considered as significant.

RESULTS

The mean ages of group 1, group 2 and group 3 were 58.44 ± 8.247 , 56.54 ± 7.510 and 59.82 ± 8.894 respectively. Interestingly, out of the 300 participants, only 6 were non-type D while the rest (n=294) were classified as type D based on DS-14 scores of negative affectivity and social inhibition. Significant differences in social inhibition, negative affectivity, anxiety and depression were observed between the three groups (Table 1, Figure 1-3).

Significantly higher levels of negative affectivity were observed in group 3 (mean + SD score; 14.18 + 2.266) as compared to group 1 (mean \pm SD score; 12.90 \pm 2.085), with mean difference of 1.273 (p-value = 0.000) as depicted in figure 3. Similarly, marked difference was present among group 1 (mean \pm SD score; 12.90 \pm 2.085) and group 2 (mean + SD score; 13.75 \pm 2.101) with mean difference of - 0.844 (p-value = 0.019) as illustrated in figure 1. There was no marked difference for negative affectivity between group 2 and group 3 (Table 2).

For social inhibition, marked difference was observed between group 3 (mean \pm SD; 14.50 \pm 2.181) and group 1 (mean \pm SD; 13.42 \pm 2.148), having mean difference of 1.081 (p-value = 0.001) (figure 3 and 1). Significant difference was present between group 1 (mean + SD score; 13.42 + 2.148) and group 2 (mean \pm SD score; 14.35 \pm 2.052) for social inhibition with mean difference of -0.934 (pvalue = 0.007) as described in figure 1 & 2. No difference was observed between Group 2 and 3 (Table 2).

Significant difference in anxiety levels was observed between group 3 (mean + SD; 11.87 + 2.400) and group 1 (mean \pm SD; 10.63 \pm 2.413), with mean difference of 1.236 (p-value= 0.001) as showed in figure 1 & 3. Significant difference in anxiety levels was also observed between group 1 (mean \pm SD; 10.63 \pm 2.413) and group 2(mean \pm SD; 11.43 \pm 2.139), with mean difference of -0.8 (p-value = 0.046). No difference was seen between group 2 and group 3 (Table 2).

For depression, significant difference was seen between group 3 (mean \pm SD 10.44 \pm 3.058) and group 1 (mean \pm SD 8.62 \pm 2.279), with mean difference of 1.812 (pvalue = 0.000). Similarly, significant difference was observed between group 3 (mean \pm SD; 10.44 \pm 3.058) and group 2 (mean \pm SD; 9.24 \pm 2.313) with mean difference of 1.193 (pvalue = 0.003). No difference in depression was seen between group 1 and group 2 (Table 2). Negative affectivity, social inhibition, anxiety and depression were positively correlated with type A personality, type B and balanced personalities as well (Table 3).

ROC curves depicted leftward shift (levo-shift) from group 1 to group 3 reflecting that all the studied parameters including anxiety, depression, social inhibition and negative affectivity show an increasing tendency from type B to type A personality (Figure 1-3) indicating marked severity for all the studied factors and their association to type A personality.

Parameter	Type B personality (n=93) Mean± SD	Balanced Personality (n=99) Mean ±SD	Type A personality (n=108) Mean± SD	p-value
Negative Affectivity Scores	12.90± 2.085	13.75± 2.101	14.18±2.266	0.000*
Social Inhibition scores	13.42±2.148	14.35± 2.052	14.50± 2.181	0.001*
Anxiety scores	10.63± 2.413	11.43± 2.139	11.87±2.400	0.001*
Depression scores	8.62± 2.279	9.24± 2.313	10.44±3.058	0.000*

Table I. Group of	comparisons on	personality factors,	anxiety and de	pression scores
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*Difference is significant at 5% level of significance

	Table 2. Multiple com	parisons on DS-14	parameters, anxiet	y and depression scores
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Parameter	Group(I)	Group(J)	Mean difference (I-J)	p-value
Negative Affectivity Scores	Group 1	Group 2	-0.844*	0.019*
		Group 3	-1.273 [*]	0.000*
	Group 2	Group 1	0.844*	0.019*
		Group 3	-0.428	0.328
	Group 3	Group 1	1.273*	0.000*
		Group 2	0.428	0.328
Social Inhibition Scores	Group 1	Group 2	934 [*]	0.007*
		Group 3	-1.081 [*]	0.001*
	Group 2	Group 1	0.934*	0.007*
		Group 3	-0.146	0.874
	Group 3	Group 1	1.081 [*]	0.001*
		Group 2	0.146	0.874
Anxiety scores	Group 1	Group 2	800 [*]	0.046*
		Group 3	-1.236 [*]	0.001*
	Group 2	Group 1	0.800*	0.046*
		Group 3	436	0.369
	Group 3	Group 1	1.236 [*]	0.001*
		Group 2	.436	0.369
Depression scores	Group 1	Group 2	619	0.226
		Group 3	-1.812 [*]	0.000*
	Group 2	Group 1	0.619	0.226
		Group 3	-1.193*	0.003*
	Group 3	Group 1	1.812 [*]	0.000*
		Group 2	1.193*	0.003*

*Difference is significant at 5% level of significance

Figure 1: ROC curve for Group 1 (Type B Personality).



Diagonal segments are produced by ties.

Parameters	Type A personality		Type B personality		Balanced personality	
	Person correlation ®	P value	Person correlation ®	P value	Person correlation ®	P value
Negative Affectivity (DS-14)	0.248	0.010*	-0.093	0.373	0.095	0.169
Social Inhibition (DS-14)	0.665	0.042*	0.052	0.622	0.019	0.854
Anxiety levels (HADS)	0.234	0.016*	0.003	0.981	0.188	0.062
Depression levels (HADS)	0.775	0.028*	0.113	0.282	-0.045	0.660

Table 3: Pearson's Correlation of various factors with Type A, Type B and Balanced personality.

*Difference is significant at 5% level of significance

Figure 2: ROC curve for Group 2 (Balanced Personality).







DISCUSSION

The results of this study reinforce the link between stressful personality types and the increased risk of MI but some of the current findings provide new insights with potentially important implications. A case control study by Salmoirago-Blotcher et al showed a clear association between higher levels of distress and anxiety in pre- and post-admission cardiomyopathy patients, however, links with depression were not clearly established ^[14]. The present study has demonstrated a highly significant positive linear correlation of depression with type A personality in post-MI patients (Table 3; r=0.278, p=0.000). This may potentially be an effect of hospitalization and psychological trauma of the MI diagnosis rather than being a cause of the latter. Serious health concerns associated with life-threatening conditions

like MI can take a heavy physical as well as psychological toll on the affected patients by diminishing self-efficacy due to poor anxiety and depression management. Kalter J et al have previously showed that customized psychotherapy and coping strategies allow patients with serious conditions like cancer to combat anxiety and depression efficiently ^[15].

Adverse outcomes based on DS14 indicating negative affectivity and social inhibition are known to diminish selfefficacy. Thus, incidence of MI is at present correlated with self-perceived categorization into type D personality ^[16,17]. The current study demonstrated positive correlation of the DS-14 parameters of negative affectivity with type A personality seen in post-MI patients. A South Indian study conducted by Pillai et al on post-MI patients showed that depression and low family support are strong predictors of type D personality. In their study, however, only 24 percent of the cases were identified as type D using DS-14. The South Indian study employed type D and non-type D as two distinct populations whereas the current observations highlighted type D as a highly predominant personality type in the studied post-MI patients ^[18].

This study is limited by a lack of overall follow-up to the progress of disease complication and potential shifts in attitudes and personalities. Also, data on pre-MI status is lacking which could have proved pivotal in understanding the cause and effect relationship between personality types and the risk of MI. Pushkarev et al prospectively studied patients undergoing coronary stenting and found Type D personality typing in almost one-third of the cases, but no link was found between severity of CVDs and type D grouping. However, the study did not employ the RFPA classification of personality which may have elucidated association between disease severity and personality types ^[19]. Kawachi et al have previously described an increased risk of coronary heart disease among type A personality but the current study showed an equal distribution of type A, Type B and borderline personality types in the post-MI patients. However, type A personality was strongly correlated with the attributes of type D personality including negative affectivity and social inhibition as well as psychological manifestations including anxiety and depression, which are themselves known to increase the risk of CVDs ^[20, 21]. In a study by Pederson et al, type D personality was suggested as an adverse outcome predictor following MI [21]. However, another study by Martens et al on patients 18 months after an acute attack of MI showed no difference in prognosis between type-D and non-type D personalities ^[22].

CONCLUSION

Type A personality is more prone to higher anxiety, depression, social inhibition as well as negative affectivity in post-MI patients. Type D personality is by far the predominant personality type in post-MI patients. Personality assessment and management of anxiety and depression should be made be a part of the management of patients with MI.

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CONFLICT OF INTEREST

None of the authors have any conflict of interest to declare. **REFERENCES**

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