# Anger predicts long-term mortality in patients with myocardial infarction

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There is a growing awareness that psychological factors play a major role in triggering and modulating the progression of ischemic heart disease. Negative emotions such as hostility, anger, depression, anxiety and social isolation are cardio-toxic, whereas positive feelings characterized by imagination, empathy, and spiritual interests are cardio-protective. A type D (for Distress) personality is described as someone with the tendency to live negative emotions and experience strong inhibitions to express them, and has been associated with a special vulnerability to ischemic heart disease.

Doctor Franco Bonaguidi, researcher and psychologist in a multidisciplinary team of cardiologists and epidemiologists at the IFC Institute, specialising in cardiovascular disease said: "For a long time I have been interested in the important, but still largely elusive, relationship between personality traits, negative emotions and prognosis in cardiology. This is important in the group of patients recovering from an acute myocardial infarction, who have a special vulnerability (since they are at higher risk compared to patients with stable coronary artery disease). The good news is that these patients have the opportunity to change their behaviour, since they have recently experienced a life-threatening condition (such as acute myocardial infarction) which often leads people to reassess the whole of life balance and priorities. This is a suitable time for psychological intervention and behavioural therapy, when needed".

The overall aim of the study was to assess whether personality traits and,

in particular anger-prone behavioural responses, may affect prognosis in patients who survived an acute myocardial infarction.

A total of 228 patients hospitalised in 13 Coronary Care Units of northern and central Italy from 1990 to 1995, with the diagnosis of acute myocardial infarction (AMI) were included in the study. Before their discharge, patients underwent a psychological evaluation by using Cattell's Sixteen Personality Factors Questionnaire and Psy Inventory. Cattell's questionnaire assesses secondary factors obtained from a factorial analysis of raw scores of 16 primary factors (Extraversion, Anxiety, Sensitivity, Self-control). The PSY inventory measures 6 psychological traits, only in part covered by the profile of type A personality (Responsibility, Energy, Obsessive behaviour, Anger, stress-related disturbances and time urgency).

After discharge the patients entered a programme of clinical follow-up for ten years, during which 51 cardiac events were recorded. To understand which factors were able to predict these events the authors used a statistical analysis known as the Cox model. Examining factors such as the age of patient, gender, psychological variables, clinical data (traditional risk factors, peak cardiac necrosis enzymes, left ventricular wall motion score index and heart rate variability), the results show that the only factors able to predict cardiac events in patients are the Anger and Stress-related disturbances, with a relative risk of 2.30 and 1.90 respectively. Patients who had reported a high score on the Anger scale had a higher risk of experiencing a new event, 2.30 times superior in comparison with those who had reported a low score on the same scale.

Expressing the results in terms of infarction-free survival with the Kaplan-Meier method ten years after infarction, the patients with high score of anger show a significantly lower ( 57,4%) infarction-free survival in comparison with the other set (78.5%).

The results of our study confirm the results of other important studies. Actually a recent meta-analysis of 25 studies of Chida and Steptoe (J Am Coll Cardiol. 2009) shows that anger and hostility are associated with coronary heart disease outcomes both in healthy and coronary heart disease population.

Anger is a recognized predictor of adverse outcome in patients with cardiovascular disease and can be specifically characterized by tailored questionnaires. Anger is a primitive emotion which cannot be switched off at will. It can have a constructive function when it serves to overcome obstacles and reach certain objectives. Beyond a certain level, or in presence of underlying vulnerability due to genetic or environmental factors, anger can trigger unfavourable hemodynamic, neural and endocrine changes through excessive sympathetic activation and can chronically contribute to self-destructive life habits, food and alcoholic addiction.

Anger becomes destructive when it is impotent, manifesting itself in grievance, resentment, irritability and frustration. At times, anger masks sorrow, a deeper and more painful emotion. Acknowledgement of inner states of mind can lead to psychological and spiritual growth which has a beneficial impact on spiritual well-being. As Shakespeare writes: "Give sorrow words; the grief that does not speak, whispers the over- fraught heart and bids it break" (Macbeth, act IV, scene III)

These results suggest the necessity of a multidimensional therapeutic approach which includes not only physical and pharmacological therapy, but also psychotherapy treatment targeted not only on anger but also toward a deeper suffering, of which anger is often an expression.

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