Prognostic value of Type D Personality compared with depressive symptoms

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Prognostic Value of Type D Personality Compared With Depressive Symptoms

The association between depression and coronary artery disease (CAD) is complex, and a more detailed subtyping of high-risk patients is needed.[1-3] Type D personality (the tendency to experience negative emotions and to be socially inhibited) is also related to poor prognosis.[4] There has been vigorous debate about whether Type D personality adds to the evidence concerning depression.[3] It is important to show that the predictive validity of Type D personality extends beyond that which can be predicted by depression, but to our knowledge, no study to date has compared the cognitive-affective symptoms of depression, as measured by the Beck Depression Inventory (BDI), with the Type D personality construct.

We therefore examined the relative effect of Type D personality and depressive symptoms on 5-year cardiac prognosis in 337 Belgian patients with CAD (297 men; mean age, 57.0 years).[4] Covariates included exercise tolerance, index myocardial infarction (MI), and left ventricular ejection fraction (LVEF). The BDI–short form (BDI-SF) has a correlation of 0.96 with the 21-item BDI[5] and was used to evaluate cognitive-affective symptoms of depression (eg, sadness, hopelessness, sense of failure, guilt, suicidal thoughts, self-hate, dissatisfaction, indecisiveness, and fatigue). A score greater than 5 on the BDI-SF denotes those with depressive symptoms[5] and proved to be the optimal threshold for identifying patients at risk of cardiac events in the present study. The DS16 scale was used to assess personality[4]; 98 patients (29%) were classified as Type D personality.

At baseline, 181 patients (54%) displayed no or low levels of distress. Among the 156 emotionally distressed patients, only one-third (n=55) had elevated scores for both Type D personality and depression; 28% (n=43) had a Type D personality but were not depressed; and 37% (n=58) were depressed but did not have a Type D personality. Shared variance between Type D personality and depression was only 9% (Φ coefficient, 0.31). Diagnosis of Type D personality was not a function of sex ($P=.84$), age ($P=.27$), or disease severity as indicated by exercise tolerance ($P=.34$), index MI ($P=.43$), or LVEF ($P=.49$).

After 5 years of follow-up, 46 patients (14%) had experienced a major adverse cardiac event (MACE, defined as a composite of cardiac death, MI, coronary artery bypass graft, or percutaneous coronary intervention), including 12 cardiac deaths or MIs. The **Table** shows that MACE was associated with index MI, LVEF of 40% or lower, and no coronary artery bypass graft. Both Type D patients and depressed patients had an increased event rate compared with non–Type D ($P=.001$) and nondepressed ($P=.01$) patients, respectively. When entering both factors in a multivariable model, Type D personality (odds ratio, 2.44 [95% confidence interval, 1.25-4.76]; $P=.009$) but not depression (odds ratio, 1.71 [95% confidence interval, 0.88-3.33]; $P=.12$) was significantly associated with MACE.

After adjustment for MI, LVEF, and coronary artery bypass graft, Type D patients had a 3-fold increased risk of MACE (Table, bottom); depression did not predict MACE. Analyses using continuous scores for the Type D personality and depression measures did not change

Table. Predictors of Major Adverse Cardiac Events at the 5-Year Follow-up Examination[a]

Baseline Characteristic	Event Free, No. (%) (n=291)	Cardiac Events, No (%) (n=46)	Odds Ratio (95% Confidence Interval)	*P* Value
Univariate analysis				
Male sex	260 (89)	37 (80)	0.49 (0.22-1.11)	.09
Age ≤55 y	128 (44)	20 (44)	0.98 (0.52-1.83)	.95
Poor exercise tolerance	156 (54)	24 (52)	0.94 (0.51-1.76)	.86
Index MI at baseline	107 (37)	29 (63)	2.93 (1.54-5.59)	.001
LVEF ≤40%	24 (8)	9 (20)	2.71 (1.17-6.27)	.02
No CABG at baseline	93 (32)	33 (72)	5.40 (2.72-10.75)	<.001
Type D personality	75 (26)	23 (50)	2.88 (1.52-5.43)	.001
Depressive symptoms	90 (31)	23 (50)	2.23 (1.19-4.19)	.01
Multivariable analysis				
Index MI at baseline			1.14 (0.48-2.76)	.76
LVEF ≤40%			4.46 (1.71-11.63)	.002
No CABG at baseline			5.88 (2.29-15.06)	<.001
Type D personality			3.06 (1.48-6.33)	.003
Depressive symptoms			1.29 (0.62-2.66)	.49

Abbreviations: CABG, coronary artery bypass graft; LVEF, left ventricular ejection fraction; MI, myocardial infarction.
[a]Composite of cardiac death, recurrent MI, CABG, or percutaneous coronary intervention.

the results, nor did the use of a different cutoff score for the depression measure. Finally, Type D patients had a greater risk for cardiac death or MI compared with non–Type D patients (7 of 98 [7%] vs 5 of 239 [2%]; odds ratio, 4.84 [95% confidence interval, 1.42-16.52]; $P=.01$); depression was not related to this end point ($P=.25$).

These findings show that Type D personality may have unique prognostic value beyond that of depressive symptoms. Only one-third of distressed patients with CAD had both a Type D personality and were depressed (28% had Type D personality and were nondepressed and 37% had a depressed and non–Type D personality), Type D personality was associated with a 3-fold increased risk of MACE, controlling for depression, and Type D personality but not depression predicted MACE, adjusting for disease severity. Another study also showed that Type D personality was associated with increased cortisol levels in patients with CAD, whereas depression as assessed by the BDI was not.[6] Hence, Type D personality is more than just a marker of depression and should be assessed in its own right in patients with CAD.

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Validation and Comparison of a Novel Screening Guideline for Kidney Disease: KEEPing SCORED

Chronic kidney disease (CKD) is one of the world's major public health problems. Nearly 1 in 9 adults (20 million people) in the United States have CKD, and it is estimated that another 20 million are at increased risk.[1] Given the asymptomatic nature of kidney disease, affected individuals and health care providers may be unaware of the condition in patients. Identifying individuals with early kidney disease would be a useful first step in preventing progression to end-stage renal disease as well as reducing morbidity and mortality from cardiovascular disease (CVD).

We recently published an instrument (SCreening for Occult REnal Disease [SCORED]) to systematically identify individuals with a high likelihood of prevalent CKD.[2] Derived from the National Health and Nutrition Examination Survey (NHANES) 1999-2002 and (partially) validated in the Atherosclerosis Risk in Communities (ARIC) study, SCORED identified 9 demographic and medical variables that could be assigned integer values and then entered into a scoring algorithm. The scoring algorithm was intentionally simplified to be accessible to lay persons and health care providers.

To our knowledge, SCORED is the only algorithm derived from scientific modeling, rather than expert scientific opinion, targeted for general population screening. Alternatively, the National Kidney Foundation has encouraged screening strategies targeted at high-risk groups. Through the Kidney Early Evaluation Program (KEEP), the National Kidney Foundation recommends using the following characteristics to identify individuals with a high likelihood of kidney disease: "if a person is 18 years or older and has one or more of the following: diabetes; high blood pressure; or a family history of diabetes, high blood pressure or kidney disease."[3,4]

It is unclear how the SCORED algorithm compares with the KEEP guidelines. Such comparisons would be useful for clinicians and others. Since the publication of SCORED, we have performed an additional validation study using new, independent samples: (1) NHANES 2003-2004 and (2) a combined cohort of the ARIC study and Cardiovascular Heart Study (ARIC/CHS). We report the findings herein.

Methods. The ARIC study enrolled 15 792 participants aged 45 to 64 years between 1987 and 1989, and CHS recruited 5201 subjects 65 years and older between 1989 and 1990. Both are community studies, and detailed descriptions have been published previously.[2,5,6] Some data disparities and limitations to be noted are summarized in a footnote of the **Table**.

SCORED Model. The SCORED model is a multivariable mathematical function that gives an estimated probability of having CKD as follows:

$$\text{Probability(CKD)} = 1/[1+\exp(-\beta' \times x)],$$

where

$$\begin{aligned}\beta' \times x = &-5.4 + 1.55 \times I(\text{Age 50-59 years}) \\ &+ 2.31 \times I(\text{Age 60-69 years}) \\ &+ 3.23 \times I(\text{Age} \geq 70 \text{ years}) \\ &+ 0.29 \times I(\text{Female}) \\ &+ 0.93 \times I(\text{Anemia}) \\ &+ 0.45 \times I(\text{Hypertension}) \\ &+ 0.44 \times I(\text{Diabetes}) \\ &+ 0.59 \times I(\text{History of CVD}) \\ &+ 0.45 \times I(\text{History of Heart Failure}) \\ &+ 0.74 \times I(\text{Peripheral Vascular Disease}) \\ &+ 0.83 \times I(\text{Proteinuria}).\end{aligned}$$