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Men deny and women cry, but who dies? Do the wages of "denial" include early ischemic coronary heart disease?

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Abstract

Objectives: In this study patients with documented ischemic coronary heart disease (ICHD; prior MI or CAD per catheterization) were tested for the association of various measures of emotional distress with Age at Initial Diagnosis. **Methods:** The measures were chosen because of a published track record at predicting mortality in this population. Females were oversampled to achieve equivalent numbers of each sex ($n = 50$), and thus equivalent statistical power. In a subset of patients (38 males and 32 females), Spouse/Friend Ketterer Stress Symptom Frequency Checklists (KSSFCs) were received. **Results:** Females reported more depression and anxiety than males. However, spouses or friends reported more anger for males.

Denial (spouse/friend minus self-ratings) was greater in males for all three scales of the KSSFC (Anger, $P = .005$; Depression, $P = .024$; Anxiety, $P = .001$). Although females showed the same trend, self and spouse or friend ratings of distress were significantly associated with Age at Initial Diagnosis only in males. When split at the sample mean on the Spouse/Friend KSSFC AIAI (Anger) scale, Age at Initial Diagnosis occurred 14.2 years earlier in males. **Conclusions:** Use of a significant other in assessing psychosocial/emotional distress in males may confer greater accuracy, and therefore predictive power for clinical endpoints.
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Keywords: Coronary artery disease; Denial; Stress; Sex differences

Background

Psychometrically validated instruments provide a cost effective means of screening patients with ischemic coronary heart disease (ICHD) for emotional distress. However, it is widely assumed that females are more forthcoming than males about their emotional distress. For example, females are twice as likely as males to accept psychiatric treatment even though the overall prevalence rate for such conditions is equivalent across the sexes [1]. And reported intratest irritability on a mental stress task was associated with ischemia for females, but not males [2]. However, no direct empirical test of this hypothesis has ever been published. For the researcher attempting to test the relationship of emotional distress to objective disease outcomes, such "denial" would be a source of measurement error, weakening any test of the association and confounding cross-sex comparisons. For clinicians, denial/minimization would reduce accuracy in patient interviews or on self-report questionnaires and, therefore, detection and monitoring of response to treatment. Historically, clinicians have long sought information from collateral sources (e.g., family members, nurses, records, etc.) when denial of stigmatized information was suspected.

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The Ketterer Stress Symptom Frequency Checklist (KSSFC) [3] provides two parallel versions of the same questionnaire — one to be completed by the patient about him or herself, and one rewritten for a spouse or friend to complete about the patient. It is a 58-item questionnaire that asks the patient or spouse/friend to rate the frequency (0 = never, 1 = once a year, 2 = several times a year, 3 = once a month, 4 = several times a month, 5 = once a week, 6 = several times a week, 7 = once a day, 8 = several times a day, 9 = constantly) of thoughts, feelings and behaviors. Three scales (AIAI or "aggravation, irritation, anger and impatience", Depression and Anxiety/Worry) are constructed by adding the number of items that equal or exceed 1 S.D. above the item's mean based on a normative sample. For example, the AIAI scale asks the subject — "Over the past year, how often do you: feel or act angry; fight with your spouse; fight with your children; blow up; fight with your boss; yell at someone; fight with coworkers; feel or act irritable; want to hit someone; want to yell at someone; criticize others; feel or act frustrated; feel or act annoyed; feel, or act as if under stress; feel or act hassled". The spouse/friend version of the KSSFC asks about the same behaviors with a different stem: "Over the past year, how often does your spouse or friend...?"

When comparing self- and spouse/friend-rated distress on the KSSFC in cardiac populations, spouse/friend-rated distress is a stronger correlate than self-report of coronary artery disease severity by angiogram [4], chest pain at 5-year follow-up [5] and early Age at Initial Diagnosis [6]. Using other ad hoc measures, both Kneip et al., [7] and Siegman et al. [8] have found spouse ratings of hostility/anger to be superior to self-ratings as correlates of perfusion defects. For early Age at Initial Diagnosis, both self and spouse/friend versions of the KSSFC have proven superior to a number of

other psychometric measures that are known predictors of mortality [6]. Furthermore, "denial" indices (spouse/friend minus self-ratings) have proven a superior correlate of CAD severity [4] and mortality [5]. Some occurrence of denial is observed with all three scales, but occurs most reliably for AIAI [3].

Because of presumed, but unproven, beliefs about the differences between the sexes in accuracy of self-acknowledge emotional distress, the present study sought to compare males and females on the major psychometric predictors of mortality in ICHD and as correlates of early Age at Initial Diagnosis. It should be noted that depressed/anxious, but denying, patients may present the nonstigmatized physical symptoms of depression/anxiety (fatigue, chest pain, dyspnea) or related nonstigmatized symptoms (disability, insomnia) while minimizing mood/cognitive symptoms [9–11]. Thus, patients whose symptoms are nonresponsive or only partially responsive to cardiac therapies should be considered for a trial of antidepressant/anxiety therapy. Not only will quality-of-life be improved by such treatment, but compliance [12–15] and morbidity/mortality [16–20] may be favorably affected.

Methods

Subjects

The data used here are based on a retrospective chart review of 50 males and 50 females with documented coronary artery disease (coronary artery disease by catheterization and/or prior myocardial infarction) who were referred for "stress management" from a Cardiac Rehab Program or the General Cardiology Clinics. The present

Table 1
Clinical/demographic variables compared across the sexes in the total sample and the subgroup for whom the spouse/friend KSSFC was received

	Total sample			S/F KSSFC subgroup		
	M (n = 50)	F (n = 50)	P	M (n = 38)	F (n = 32)	P
t Tests						
Age at Initial Diagnosis	53.8	51.9	.443	55.1	53.5	.632
Current age	57.9	56.8	.654	59.8	57.6	.467
Years of education	13.7	13.0	.129	13.9	13.5	.472
Packyears of smoking	37.7	21.9	.013	36.4	22.6	.080
Body mass index	29.3	30.9	.222	28.7	30.8	.168
Chi-squares						
Hx of revascularization	78%	70%	.362	76%	63%	.209
Hx of MI	76%	80%	.629	74%	81%	.453
Married	82%	58%	.009	87%	63%	.018
Hx of divorce	28%	48%	.039	29%	56%	.021
Hx of hypercholerolemia	72%	68%	.663	71%	72%	.940
Hx of hypertension	58%	82%	.009	58%	81%	.036
Current smoker	20%	30%	.248	16%	22%	.514
Early family history of ICHD	50%	44%	.548	47%	47%	.967
Hx of diabetes	16%	24%	.317	18%	22%	.719
Snoring	40%	18%	.015	39%	13%	.012

Table 2
Psychometric variables compared across the sexes in the total sample, and the subgroup for whom the spouse/friend KSSFC was received

	Total sample			SF KSSFC subgroup		
	M ($n=50$)	F ($n=50$)	P	M ($n=38$)	F ($n=32$)	P
t Tests						
KSSFC-Patient						
AIAI	4.0	4.6	.462	3.9	4.4	.584
Depression	3.5	5.0	.003	3.6	5.2	.015
Anxiety	6.5	9.5	.014	6.7	10.3	.010
KSSFC–Spouse/Friend						
AIAI	NA			5.6	3.4	.028
Depression	NA			3.4	3.5	.972
Anxiety	NA			7.8	6.5	.354
Beck Depression Inventory	14.1	19.9	.081	12.2	16.1	.032
Crown–Crisp Phobic Anxiety Scale	5.7	10.4	.160	3.9	6.6	.002
Chi-squares						
Type D	22%	34%	.181	24%	34%	.324

study expands on a previously reported sample [6] by oversampling females to achieve equivalent numbers and thus statistical power. For a subset of the sample (38 males and 32 females), Spouse/Friend KSSFCs were received. Demographic characteristics are contained in Table 1.

Instruments

The Beck Depression Inventory [21], Type D Scale [22], Crown–Crisp Phobic Anxiety Scale [23] and Ketterer Stress Symptom Frequency Checklist [3] have been described elsewhere. As we have previously shown, these measures are among the most potent predictors of death in ICHD patients [24]. The Background section describes the latter instrument.

Procedures

As part of a routine initial clinical evaluation, subjects were interviewed using a standardized format for quantifying clinical/demographic risk factors. These included current age (in years); years of education; packyears of smoking (maximum packs per day × number of years as a smoker); body mass index; history of revascularization; history of myocardial infarction; marital status; history of divorce; history of hypercholesterolemia (maximum total cholesterol of 240 mg%); history of hypertension (maximum resting casual values of 139/89); current smoker; early family history of ICHD (defined as at least one first or second degree relative who developed ICHD before age 56); history of diabetes (0 = none; 1 = diet managed; 2 = oral medications; 3 = injections); and snoring (none at all OR

lightly/occasionally VS. usually OR loudly/constantly). They were then asked to complete the psychometric questionnaires. In addition, subjects were asked to have "someone who knows you well" complete and return the spouse/friend version of the KSSFC, and then provided with a stamped, addressed envelope containing the questionnaire as well as written instructions asking the spouse or friend to complete and return the KSSFC *before* discussing it with the patient.

Analyses

The p ≤ .05 level of significance was used.

Clinical/demographic and psychometric data were compared between sexes, using Student *t* tests and chi-squares.

For each sex, psychometric data were then tested for their association with Age at Initial Diagnosis, using *t* tests and Pearson Product-Moment Correlation Coefficients.

Cross-sex comparisons of the Age at Initial Diagnosis correlation coefficients were made for the psychometric variables, using *r*-to-*z*-score transformations (independent sample).

Cross-source comparisons of the Age at Initial Diagnosis correlation coefficients for each sex were made for the three scales of the KSSFC using *t* tests (correlated, within-subject sample).

To gauge the strength of the effect, the males on whom the Spouse/Friend KSSFC was received were divided at the sample mean for the Spouse/Friend AIAI rating and Age at Initial Diagnosis was compared.

Results

Males reported more packyears of smoking, were less likely to have a history of divorce and hypertension, but were more likely to have a history of snoring and to be currently married than females. These results are contained in Table 1.

Females reported more anxiety and depression than males. But spouse/friends reported more anger for males than females. For all three scales of the KSSFC, a greater likelihood of denial (spouse/friend minus self-ratings) was
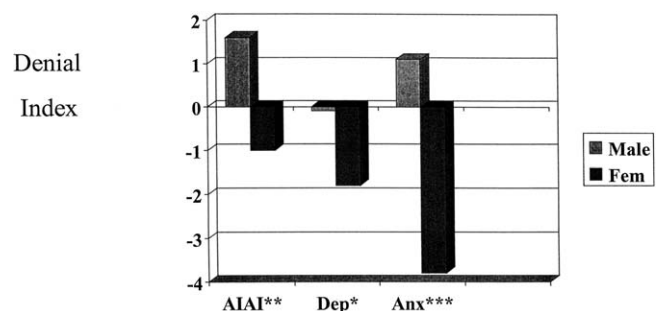

Fig. 1.

Table 3
Association (Pearson correlation coefficients, t tests) of psychometric measures with Age at Initial Diagnosis

	Total sample		SF KSSFC subgroup	
	M ($n = 50$)	F ($n = 50$)	M ($n = 38$)	F ($n = 32$)
Pearson correlations				
KSSFC — Patient AIAI	− .339**	− .220	− .376**	− .179
Depression	− .363**	− .091	− .409**	− .114
Anxiety	− .273*	− .108	− .323*	− .107
KSSFC — Spouse/Friend				
AIAI	NA		− .661***	.064
Depression	NA		− .288*	− .005
Anxiety	NA		− .509***	− .070
Beck Depression Inventory	− .073	− .031	− .210	.010
Crown–Crisp Phobic				
Anxiety Scale	.033	− .040	.140	− .104
t Test				
Type D	− 1.91*	− .85	− 1.74*	− .93

Comparisons of differences between correlations:
Male vs. Female. Total Sample–Depression: $P = .033$. Spouse/Friend
 KSSFC Subgroup–Depression: $P = .039$.
Patient vs. Spouse/Friend (male KSSFC Subgroup only)–AIAI: $P = .049$.
 * $P \leq .05$.
 ** $P \leq .01$.
 *** $P \leq .001$.

observed in males compared with females. For example, 55% of males displayed denial of AIAI (a scale discrepancy of one point or more with the spouse/friend reporting higher levels) while 31% of females did so. Males displayed denial on at least one of the three scales 71% of the time, while females did so 44% of the time. These results are contained in Table 2 and Fig. 1.

For males only, all three scales of the KSSFC were negatively associated with Age at Initial Diagnosis in both the total sample and the Spouse/Friend KSSFC subgroup. Spouse/friend-reported AIAI yielded a significantly stronger relationship with Age at Initial Diagnosis than self-report, but for males only. The Type D Scale also achieved significance in both samples for males. For females, no significant relationships were observed between the psychometric measures and Age at Initial Diagnosis. In both the total sample and the spouse/friend subgroup, Depression was more strongly associated with Age at Initial Diagnosis in males than in females. These results are contained in Table 3.

Males who were above the sample mean on the KSSFC AIAI scale had an Age at Initial Diagnosis 14.2 years younger than those who were below the sample mean (47.6 vs. 61.8 years of age).

Discussion

Present results must be interpreted in light of any processes determining entry to the sample. Thus, patients whose first symptom of ICHD is death, or who are asymptomatic, are unavoidably excluded. Likewise only those patients who were recognized as "stressed" by their internist/cardiologist and who accepted referral are included. For the females, the low current marriage rate and low return rate for the Spouse/Friend KSSFCs suggests a possible skewing of the sample. While multiple theoretical effects on our results could be hypothesized for these selection factors, to the best of our knowledge there is no empirically validated, a priori reason to assume that these selection biases would change our results in one direction or another. None the less, future work should attempt to minimize or eliminate these possible biases, probably by recruiting a clinically unreferred sample.

As seen in Table 3, it is striking that males, and not females, display a strong propensity for both self and spouse/friend ratings on the KSSFC to correlate with Age at Initial Diagnosis, a finding consistent with recently reported results from the Precursors Study [25]. This effect occurs despite clear evidence of under-reporting of distress relative to spouse/friend ratings for males, and over-reporting relative to a spouse/friend for females. While females show a trend for self-reported distress, particularly AIAI, to correlate with Age at Initial Diagnosis, the present limited sample size does not permit us to prove a significant effect. One possible interpretation of this finding is that emotional distress is a weaker correlate of early Age at Initial Diagnosis in females than males. This would be consistent with the well-documented 8–10 year delay in onset for ICHD in females relative to males, generally thought to be a byproduct of premenopausal hormonal status [26]. Thus, a distressed vs. nondistressed comparison of postmenopausal females might be a better test of the role of stress in ICHD for females.

It is also striking that spouse/friend ratings for males (at least for AIAI) seem to be more potent correlates of Age at Initial Diagnosis than self-ratings, while self-ratings are equipotent or perhaps marginally superior for females. This suggests that screening/evaluation of males may require inquiry of a significant other to be maximally accurate. The same may not be true for females [27]. "Denial" (or "minimization" or "alexithymia") may be a fatal mistake for males in a very concrete meaning of the term!

Our results cannot identify the psychological mechanism (prevarication about, mislabeling or nonexperience of these emotions) that accounts for the discrepancy between self- and spouse/friend-reported distress in males. We suspect that more than one of these processes may be occurring. For pragmatic clinical purposes, and regardless of the mechanism involved, maximally accurate detection of distress in males with early ischemic coronary heart disease may require inquiry of a significant other. Given that such emotional distress is a strong predictor of clinical outcomes [24], and that its treatment is an effective and cost-efficient way of decreasing morbidity and mortality [16–20], the necessity of using significant others to gauge the male patient's distress may be unavoidable.

Present results would be most strongly confirmed by a prospective study of a clinically unselected sample (e.g., catheterization positives). The manpower and time commitment necessary for such a study will require financial support appropriate to its clinical importance.

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