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Coronary heart disease risk underestimation in a minority population: The Bronx Coronary Risk Perception Study

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Patients often underestimate their risk of coronary heart disease (CHD) (Ali 2002; Ammouri and Neuberger 2008; Avis, Smith and McKinlay 1989; Barnhart et al. 2009; Homko et al. 2008). To assist healthcare providers in counseling patients with high risk of CHD, we examined CHD risk factors and risk underestimation in an inner-city population. Details regarding the main study have been published previously (Barnhart et al. 2009).

From May 2004 through September 2005, 256 adults were recruited from three outpatient clinics in the Bronx, NY. Participants were 40 years of age or older and had at least one CHD risk factor. Interviews were done in English or Spanish. CHD risk perception was measured using the Coronary Risk, Individual Perception (CRIP) scale. **The CRIP scale (16 items) addresses four dimensions of risk perception: worry (I worry that I might die of a heart attack [4 items]), perceived health status (I'm as healthy as anybody I know [4 items]), self-efficacy (I think my personal efforts will help control my risk of having a heart attack [3 items]), and perceived susceptibility/vulnerability (I'm at lower risk of a heart attack [5 items]).** Respondents indicated their level of agreement (1 = strongly disagree to 6 = strongly agree). with 16 statements about CHD risk perception. Cronbach's

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α for CRIP was 0.76 (Barnhart et al. 2009). Cardiovascular risk information was obtained from medical records. Participants were considered at high risk for CHD (N=132) if they had 3 or more risk factors: age $\geq$ 65 years, hypertension, diabetes, dyslipidemia, family history of premature CHD, current smoker, or obesity (BMI $\geq$ 30 kg/m²) (Stone, Bilek and Rosenbaum 2005; Yusuf et al. 2004). Risk perception summary scores were divided into tertiles: low (27–48), medium (49–57), and high (58–84). Risk underestimation (N=73) was defined as being at high risk of CHD and in the low or medium risk perception tertile. Concordant risk estimation (N=59) was defined as being at high risk of CHD and in the high risk perception tertile. The study was approved by the Institutional Review Board.

Among participants at high risk of CHD, most were female (71%), Hispanic (63%), middle aged [58.7 $\pm$ 10.8], hypertensive (75%), obese (64%), and underestimated their risk (55%). From multiple logistic regression, factors associated with risk underestimation (yes/no) were non-diabetic subjects without a family history of premature CHD (OR=15.0, 95% CI [2.2 – 104.4] and subjects who completed the interview in Spanish (OR=2.5, 95% CI [1.0–6.1]).

A family history of premature CHD is a well established risk factor and has been previously associated with disease-specific perceived risk (DiLorenzo et al. 2006). Individuals without a family history may believe that their chances of developing CHD are reduced and may disregard other risk factors (Tversky and Kahneman 1973). In this study, the effect of family history was mitigated by the presence of diabetes. Frequent medical care for managing diabetes may provide increased opportunities for risk communication which may impact risk perception. Additional research is needed to explore this interaction.

Hispanic participants who completed the interview in Spanish were also more likely to underestimate their risk. Healthcare providers may be unable to adequately address risk reduction during a medical encounter if language discordance exists (Schryve 2007). Nevertheless, we cannot determine if this finding was due to communication barriers because the language spoken by the medical provider and access to translation services were not assessed. Also, choosing to complete the interview in Spanish only implies a preference for Spanish and not necessarily an inability to communicate in English. Thus, risk underestimation found among Spanish speaking persons might be a reflection of cultural differences and/or level of acculturation.

Through awareness that risk underestimation may be more pronounced among non-diabetics without a family history of premature CHD and among Spanish-speakers, healthcare providers can target such patients to promote more accurate levels of CHD risk perception and better self-management of modifiable risk factors.

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REFERENCES

- Ali NS. Prediction of coronary heart disease preventive behaviors in women: a test of the health belief model. *Women Health*. 2002; 35:83–96. [PubMed: 11942471]
- Ammouri AA, Neuberger G. The Perception of Risk of Heart Disease Scale: development and psychometric analysis. *J Nurs Meas*. 2008; 16:83–97. [PubMed: 18939714]
- Avis NE, Smith KW, McKinlay JB. Accuracy of perceptions of heart attack risk: what influences perceptions and can they be changed? *Am J Public Health*. 1989; 79:1608–1612. [PubMed: 2817187]
- Barnhart J, Wright N, Freeman K, Walker E. Risk Perception and Its Association with Cardiac Risk and Health Behaviors Among Urban, Minority Adults: The Bronx Coronary Risk Perception Study. *Am J Prev Med*. 2009 In Press.
- DiLorenzo TA, Schnur J, Montgomery GH, Erlich J, Winkel G, Bovbjerg DH. A model of disease-specific worry in heritable disease: the influence of family history, perceived risk and worry about other illnesses. *J Behav Med*. 2006; 29:37–49. [PubMed: 16470344]
- Homko CJ, Santamore WP, Zamora L, Shirk G, Gaughan J, Cross R, Kashem A, Petersen S, Bove AA. Cardiovascular disease knowledge and risk perception among underserved individuals at increased risk of cardiovascular disease. *J Cardiovasc Nurs*. 2008; 23:332–337. [PubMed: 18596496]
- Schryve PM. Language Differences as a Barrier to Quality and Safety in Health Care: The Joint Commission Perspective. *J Gen Intern Med*. 2007; 22:360–361. [PubMed: 17957426]
- Stone NJ, Bilek S, Rosenbaum S. Recent National Cholesterol Education Program Adult Treatment Panel III update: adjustments and options. *Am J Cardiol*. 2005; 96:53E–59E.
- Tversky A, Kahneman D. Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*. 1973; 5:207–232.
- Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, McQueen M, Budaj A, Pais P, Varigos J, Lisheng L. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. *Lancet*. 2004; 364:937–952. [PubMed: 15364185]

TABLE 1

Risk Perception among Individuals at High Risk for Coronary Heart Disease^a

	High Risk Participants N=132 n(%)	Risk Underestimation N=73 n(%)	Risk Concordance N=59 n(%)	p-value ^b
Female	96 (72.7)	52 (71.2)	44 (74.6)	0.67
Race				0.95
Hispanic	82 (62.1)	46 (63.0)	36 (61.0)	
Black	32 (24.2)	17 (23.3)	15 (25.4)	
White	18 (13.6)	10 (13.7)	8 (13.6)	
Married/marriage-like relationship	59 (44.7)	34 (46.6)	25 (42.4)	0.63
Some College	31 (23.5)	17 (23.3)	14 (23.7)	0.95
Employed	51 (41.7)	24 (32.9)	27 (45.8)	0.13
Age >65	41 (31.1)	28 (38.4)	13 (22.0)	0.04
Hypertension	99 (75.0)	55 (76.4)	44 (75.9)	0.94
Diabetes	60 (45.5)	27 (39.7)	33 (64.7)	0.01
Dyslipidemia				
Total Cholesterol	69 (52.3)	42 (57.5)	27 (45.8)	0.18
Triglycerides	72 (54.5)	39 (53.4)	33 (55.9)	0.77
Obesity	85 (64.4)	47 (64.4)	38 (64.4)	0.99
Current Smoker	26 (19.7)	14 (20.3)	12 (21.8)	0.84
Family History ^c	28 (21.2)	11 (15.3)	17 (29.3)	0.053
Spanish preferred	46 (34.8)	31 (42.5)	15 (11.5)	0.048

Study conducted from May 2004 through September 2005 at outpatient medical clinics in the Bronx, New York.

^aRisk underestimation is defined as having high risk for CHD (i.e. 3 or more cardiovascular risk factors based on medical record abstraction) and having low or medium perceived risk (determined by Coronary Risk, Individual Perception scale summary score tertiles: low =27–48, med= 49–57, high=58–84).

^b**Chi Square** comparison between participants with Risk Underestimation and Risk Concordance

^cFamily history of premature CHD