

## Body Size is a Risk Factor for Percutaneous Coronary Intervention Mortality

Peterson ED, Lansky AJ, Kramer J, et al. Effect of gender on the outcome of contemporary percutaneous coronary intervention. *Am J Cardiol* 2001;88:359-64.

### Study Overview

**Objective.** To determine whether female sex is an independent risk factor for percutaneous coronary intervention (PCI) mortality and/or complications in contemporary practice.

**Design.** Observational, cohort study.

**Setting and participants.** The data used were from the National Cardiovascular Network (NCN) database of 109,708 PCI cases from 22 hospitals between January 1994 and January 1998 [1]. The NCN database contains voluntary, confidential, and blinded data from hospitals and physicians with the purpose of internal benchmarking and quality improvement. Female participants (33%) had a mean age 66.3 years and a mean body surface area of 1.77 m<sup>2</sup>; 91.8% of women were white. Male participants (67%) had a mean age of 61.5 years and a mean body surface area of 2.04 m<sup>2</sup>; 93.8% of men were white. Women had more comorbid illnesses than did men, but also less extensive coronary disease.

**Main outcome measures.** Inhospital mortality was defined as death during or after the index procedure but before hospital discharge. Other outcome measures were stroke (persistent neurologic deficit or coma) and vascular complications (peripheral vessel occlusion, large hematoma prolonging hospital stay, pseudo-aneurysm, bleeding requiring transfusion, requirement for surgical repair, aortic dissection, iliac or femoral dissection, and acute limb ischemia). Association of sex with unadjusted and risk-adjusted procedural outcomes was evaluated using a regression model.

**Main results.** Women had higher unadjusted inhospital mortality rates (1.8% versus 1.0%;  $P < 0.001$ ), more strokes (0.4% versus 0.2%;  $P < 0.001$ ), and higher vascular complication rates (5.4% versus 2.7%;  $P < 0.001$ ). However, after adjusting for baseline clinical risk factors and body surface area, women and men had similar PCI mortality risk (adjusted odds ratio, 1.07 [95% confidence interval, 0.92 to 1.24]). Sex was not an independent risk factor for mortality among subgroups receiving coronary stent or atherectomy devices after risk adjustment.

However, women undergoing PCI remained at higher risk for stroke, vascular complications, and repeat in-hospital revascularization than men, even after risk adjustment.

**Conclusion.** In contemporary practice, a patient's body size, rather than sex, conveys independent risk for mortality after PCI.

### Commentary

This study presents an interesting evaluation of significant clinical characteristics as predictors of mortality after the use of PCI, including new techniques such as rotational and directional atherectomy, coronary laser, and transluminal extraction atherectomy. Although the study had a limited focus (variation of care and outcome based on sex), its finding of body surface area, rather than sex, as an independent predictor of mortality provides reliable data applicable to both men and women. Women still seem to be at higher risk for other important complications after PCI [2], including stroke and vascular problems; perhaps future research may be able to better define co-variables involved in these associations.

This study is probably 1 of the initial evaluations of the association of clinical characteristics with some of the newer techniques of PCI. The accuracy of these findings most likely would be tested using other databases and study designs. Perhaps we should expect the pooling of data from randomized clinical trials, because these studies do not have enough power individually to evaluate whether body surface area and female sex are independent predictors of increased mortality after PCI.

### Application for Clinical Practice

With an estimated 400,000 PCIs done annually in United States, this procedure represents a common and very beneficial management option for patients with coronary artery disease. Data that can be used to establish better risk stratification is most welcome. When considering selection criteria, body surface area, as well as sex, should be taken into account.

– Review by Pedro J. Caraballo, MD

**References**

1. National Cardiovascular Network. Available at <http://www.nhn.com>. Accessed 25 Aug 2001.
2. Maynard C, Chapko MK, Every NR, et al. Coronary angioplasty outcomes in the healthcare cost and utilization project, 1993-1994. *Am J Cardiol* 1998;81:848-52.

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