Invited Commentary

Invited Commentary: The Contribution of the BACH Survey to the Epidemiology of Urinary Incontinence

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Despite a substantial number of epidemiologic studies of urinary incontinence over the past two decades, relatively little is known about urinary incontinence in non-White women or in men. By enrolling White, Black, and Hispanic men and women, the Boston Area Community Health (BACH) Survey has added to our limited knowledge of incontinence in these groups. In general, the results from BACH, reported in the current issue of the American Journal of Epidemiology (Tennstedt et al., Am J Epidemiol 2008;167:390–399), confirm prior findings in women while extending our knowledge of the prevalence of and risk factors for incontinence in men. Interpretation of the BACH Survey results must be tempered by the low enrollment rate (less than 25% of eligible community members). The associations between cardiovascular disease and incontinence reported for some gender/race-ethnicity subgroups should be considered exploratory.

prevalence; urinary incontinence

Abbreviation: BACH, Boston Area Community Health.

In the past two decades, the study of urinary incontinence has moved from urodynamically defined incontinence among small numbers of patients referred to urologists to population-based epidemiologic studies relying on self-reported leakage of urine to identify the presence, frequency, and type of incontinence. The Boston Area Community Health (BACH) Survey, results of which are reported by Tennstedt et al. (1) in this issue, adds to the limited epidemiologic literature on urinary incontinence in Black and Hispanic women and men.

The primary limitations of the BACH Survey, as in previous large epidemiologic studies, are related to the use of self-reports and the cross-sectional study design. The questions used in BACH to assess incontinence were similar to those previously used and validated in women (2–10). Relatively little is known about the validity of these questions in men, particularly with respect to ascertaining type of incontinence. In addition, because most women and many men have experienced urinary incontinence at some time, a frequency threshold is often used to define incontinence for the purpose of examining risk factors. While the choice of this threshold is largely arbitrary, the threshold of weekly incontinence used in BACH has been used in previous studies. Since urinary incontinence is both a chronic and a dynamic condition, with progression and remission being common (11–14), the cross-sectional measure of prevalence used in most studies, including BACH, provides a necessarily limited picture.

With a few exceptions (15, 16), prior population-based studies of urinary incontinence have been limited to White women, and to my knowledge no population-based study prior to the BACH Survey has enrolled a large number of White, Black, and Hispanic women and men. To achieve this, Tennstedt et al. (1) used a two-stage, weighted, neighborhood-based sampling design to enroll proportionally larger numbers of lower-socioeconomic-status...
and minority adults. Despite a sustained effort to maximize enrollment, the overall response rate was low, as is typical for this type of study. As previously reported (17), the household response rate was 36 percent of the 32,937 targeted households; of the 10,009 individuals identified from the completed household interviews, the response rate was 57 percent. Thus, fewer than 25 percent of eligible community members were enrolled in the study. Despite this limitation, BACH has provided new and useful data on a variety of urinary symptoms (18, 19).

Results of the BACH Survey confirm prior findings in women, extend our knowledge of risk factors for incontinence in men, and suggest possible new associations. Women in BACH were found to have approximately twice the prevalence of incontinence as men, which is consistent with previous studies (20). The substantially higher prevalence of urinary incontinence among White women as compared with Black women in BACH has also been a remarkably consistent finding in previous studies (15, 16, 21–23). In contrast, there is no evidence for differences in prevalence by race/ethnicity among men in the BACH Survey—an important finding given the previously very limited study of prevalence by race/ethnicity in men (24). While it is not possible to rule out cultural differences in responses to questions about something as personal as incontinence, this would seem an unlikely explanation for the lower prevalence of incontinence among Black women as compared with White women, given the consistency and magnitude of the difference in multivariate analyses across several well-designed studies and the lack of difference between Black men and White men reported from BACH. There are many potential unmeasured differences in exposures related to race, including cultural practices surrounding toilet training, pregnancy and parturition, and coping behaviors related to incontinence. A few investigators have reported physiologic differences between Black women and White women that are consistent with a higher prevalence of incontinence in White women (25, 26). Such a difference, if confirmed, could be due to a difference in environmental influences on development or in frequencies of genetic variants. This intriguing difference deserves further study from a variety of approaches, as it offers the possibility of new insights into the cause of urinary incontinence.

The finding of lower rates of incontinence in Hispanic women as compared with non-Hispanic White women in BACH is consistent with a previous study which also enrolled Hispanic women of primarily Caribbean origin (15). In contrast, a similar study which enrolled Hispanic women primarily of Mexican origin found equal prevalences of incontinence in Hispanic and White women (16). This difference in prevalence by area of origin, if confirmed, would be notable. Distinguishing between these two Hispanic groups in future studies of female incontinence would help in testing this finding.

Several of the risk factors for incontinence in women identified in the BACH Survey, including parity, obesity, and use of hormone replacement therapy, have been well documented in previous studies (20–23, 27–29). The finding that waist circumference is more strongly associated with urinary incontinence than body mass is also consistent with previous studies (12, 22, 30), although the interpretation of this finding is not clear. The suggestion by Tennstedt et al. (1) that waist circumference, as a measure of central obesity, is associated with increased intraabdominal pressure resulting in urinary incontinence remains to be demonstrated. Other potential mechanisms are possible. For example, adipocytokines, circulating proinflammatory compounds found in higher levels in adults with central obesity, may cause neuropathy and small vessel disease (31, 32), which could contribute to the development of urinary incontinence.

The reported associations between urinary incontinence and depression, arthritis, and hormone replacement therapy in women are consistent with other studies (22, 23, 33). An association between asthma and incontinence reported from BACH is also consistent with previous studies which have found, variously, chronic lung disease, chronic cough, and smoking to all be risk factors for incontinence, although not necessarily independent of each other (15, 22, 23, 33, 34). The association between lung disease and incontinence is presumably mediated via the increased intraabdominal pressure from coughing, though this has not been empirically demonstrated. The lack of a significant association of incontinence with diabetes among women and men in BACH is somewhat surprising, as diabetes has been reported as a risk factor in many, though not all, population-based studies (12, 15, 22, 23, 27, 33, 35–37). Relying on self-reports to define diabetes in the BACH Survey, instead of medical records or laboratory testing, could have reduced the magnitude of association through misclassification. The association with diabetes may also depend on the definition of incontinence being used, with some previous studies finding a stronger relation with more severe incontinence (12, 38, 39).

The remaining associations noted by Tennstedt et al. were present in one or two of the six gender-race/ethnicity subgroups but not others (1). Given the large number of subgroup analyses, the absence of a priori hypotheses, and the absence of a discernable pattern in the associations noted, these findings must be considered exploratory or hypothesis-generating. The association between incontinence and coronary heart disease, which was significant for White men and Black women, deserves comment. There was no significant association between coronary heart disease and incontinence in all women, and there was a borderline-significant association in all men (odds ratio = 2.0, 95 percent confidence interval: 1.0, 4.2) (1). In previous studies, incontinence has been associated with conditions associated with heart disease, including obesity, diabetes, stroke, and, perhaps most importantly, poor health or frailty (22, 23, 27, 28); only some of these conditions were included in the BACH multivariate analysis. Coronary heart disease has not been reported as a risk factor for urinary incontinence in the incontinence epidemiology literature. In a study of older White women, prevalences of coronary heart disease were essentially identical in continent women and women with at least weekly incontinence (16 percent vs. 15 percent) (23). However, in a recently published nested case control-study of Swedish women with coronary heart disease who were matched to controls on several cardiovascular disease risk factors, Shakir et al. (40) found a significant association...
with urinary incontinence in bivariate analysis. Taken together, the evidence for an independent association between cardiovascular disease and urinary incontinence appears tenuous but should, and undoubtedly will, be investigated in data sets from other studies.

Lastly, Tennstedt et al. did not report on risk factors for urinary incontinence by type of incontinence (stress, urge, or mixed) in men. Differences in risk factors by incontinence type have been suggested (15, 23) but not established. Our ability to classify incontinence by type in men is limited; in the BACH data, only 41 percent of men could be classified as having stress, urge, or mixed incontinence, as compared with 94 percent of women (1). More work is needed to develop and validate classification of incontinence type using self-reports in men and to conduct studies with sufficient statistical power to allow investigation of risk factors by incontinence type in both men and women.

Tennstedt et al. (1) should be commended for completing this ambitious community-based study of urinary symptoms in a diverse sample of men and women. I look forward to seeing the results derived from their prospective data, including predictors of incident incontinence, in future publications.

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REFERENCES