



## Focus



### Barriers to Health: Factoring Obesity in Cervical Screening

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There are over 4,000 deaths annually in the United States from cervical cancer—despite both the success of cervical cancer screening programs with Papanicolaou smears, and the widespread availability and public awareness of screening. A significant majority of cervical carcinomas result from some barrier to accessing medical care, and socioeconomic barriers to screening are well documented.<sup>1,2</sup> Now, a growing body of evidence suggests another barrier to routine cervical screening: a

patient's weight.

Obesity is an independent risk factor for being diagnosed with gynecological cancers.<sup>3</sup> Obesity is also associated with the risk of dying from these cancers. No clear biological explanation exists for increased incidence and mortality from cervical cancers with obesity. In endometrial and breast cancers, the elevated risks associated with obesity may be related to the increased levels of estrogens associated with adiposity. Several studies now demonstrate that the differences in rates of screening may account for some of the increased risk of cervical cancer.

Wee and colleagues were one of the first authors to report that obesity may be an under-recognized barrier to cervical cancer screening.<sup>4</sup> Published in 2000, they reported data from the 1994 National Health Interview Survey for over 8,000 women. Among women aged 18 to 75, rates of Pap smears within the previous three years were significantly lower among overweight and obese women compared to those of normal weight. Adjusting for socio-demographic variables, insurance and access to care, medical complications, and provider specialty, differences in cervical cytology were still evident. After adjusting for the confounding variables, overweight women had rates of Pap screening -3.5% (CI, -5.9 to -1.1%) and obese women -5.3% (CI, -8.0 to -2.6%) compared to normal-weight women. The same study also found decreased rates of mammogram screening in the same overweight and obese population.

Fontaine et al. in 2001 published similar results.<sup>5</sup> They reported that after adjusting for age, race, and economic status, overweight (BMI 25 to 30) and obese (BMI > 30) women had lower rates of Pap screening within two years compared to normal-weight women (BMI 18.5 to 25). The differences seen were similar to those reported by Wee, with OR of 1.13 (95% CI, 1.07 to 1.18) for the overweight and OR of 1.38 (95% CI, 1.22 to 1.69) for the obese women. Interestingly, underweight women had decreased rates of Pap screening that mirror those of the obese subjects (OR = 1.32, 95% CI, 1.13 to 1.54). These authors also reported that the subset of white subjects in the study had a stronger association between obesity and lower rates of Pap smears.

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In a large survey, Østbye and colleagues reported the results from women over 50 years of age.<sup>6</sup> They used data from both the Health and Retirement Study (HRS) and the Asset and Health Dynamics Among the Oldest Old (AHEAD) Study. These authors analyzed BMI as a continuous variable rather than in arbitrary categories. There was a strong inverse linear association between increasing BMI and receipt of Pap screening. This trend was only observed among the white subjects.

In a follow-up study, Wee and colleagues reported Pap screening data for 12,170 women from the 2000 National Health Interview Study.<sup>7</sup> They designed a logistic regression model, adjusting for confounding factors. Subjects who were Hispanic and African American did not demonstrate an association between obesity and frequency of screening. White women with severe obesity (BMI > 40) were found to have a significantly lower rate of routine Pap screening compared to normal-weight women (RR 0.92; 95% CI, 0.83 to 0.99). This subset of subjects reported fears of embarrassment and discomfort as the primary reasons for avoiding cervical cancer screening. No differences were reported in the incidence of physician recommendations for Pap screening.

While there appears to be a consistent trend toward decreased Pap screening in obese white women, the evidence is conflicting regarding African American women. In contrast to the previous studies, Datta and colleagues reported that obesity was an independent risk factor for less frequent cervical screening among African Americans. Data from the Black Women's Health Study was used for the report, with over 59,000 participants.<sup>8</sup> In this study, 8.3 % of the subjects had not received cervical cytology within a two-year period. Independent risk factors for not receiving a Pap smear included obesity, poverty, low education level, and older age.

Ferrante et al. reported similar findings in another publication.<sup>9</sup> In a retrospective cohort study of urban New Jersey women, the authors performed a regression analysis adjusting for comorbid variables. Among African American women, being obese was associated with a significant reduction in the odds of being current with cervical cytology (OR = 0.75, 95% CI, 0.58 to 0.99,  $p = 0.041$ ). They found no significant differences in the odds of being current with mammography comparing obese to normal-weight women. Additionally, Hispanic women were significantly more likely than white women to be up-to-date in getting recent Pap smears (1.94, 95% CI, 1.24 to 3.03).

Additional studies are needed to help answer the questions about minority women, Pap screening, and obesity. Given that minority women are already at increased risk for cancer mortality, differences in screening rates may be one avenue of risk. Wee suggested that minority women may be less embarrassed or fearful about their obesity than white women. This is not strongly evidenced-based at this point, and studies regarding specific reasons why minority women do or do not get screened are needed.

Why exactly do obese women get fewer Pap smears? While there is a growing amount of literature concerning obesity and cervical cytology, there may not be enough evidence to fully answer this question. Authors have suggested embarrassment, discomfort, negative attitudes or feedback from health providers, and lack of appropriate-sized gowns, speculums, tables, and other supporting equipment. Schoenberg reported that fear of medical scrutiny regarding obesity was one of the major barriers to Pap screening in Appalachian women.<sup>10</sup> Amy et al. reported that among white and African American women, fear of disrespectful treatment, embarrassment at being weighed, negative attitudes of providers, unsolicited advice to lose weight, and medical equipment that was too small were top reasons cited for avoiding screening.<sup>11</sup>

A preponderance of evidence is available to suggest that obesity is a barrier to annual Pap smear cervical cancer screening. Given the steady increase in obesity already observed, and continued to be expected in the United States, this has important public health ramifications. There were 24 states with obesity rates over 25% in 2006, and only two states less than 20%.<sup>12</sup> The greatest increase in obesity ever observed came from 1994 to 2006. In the studies reviewed, there was a consistent 15 to 25% decrease in the rate of obese white women receiving recent Pap smears, compared to normal-weight women. The scope of this problem for eventual cervical cancer may just be starting. Minority women may be at risk as well, but additional information is needed.

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How then are we to improve this situation? There are few, if any, interventional studies with evidence-based suggestions to improve compliance with Pap screening in the obese population. Having appropriate-sized speculums, gowns, and tables is something suggested by surveys to improve patient compliance. Careful counseling and nonjudgmental discussions about obesity and weight by providers and their staffs is another approach. Whether or not pelvic exams and cervical cancer screening are actually more painful for obese patients is unknown, but evidence suggests this may be the case. This and many other questions are prime targets for additional research. Until we have more information and proven interventions, all providers who are involved in the care of women may improve the quality of care through awareness of the problem and active identification of ways to move beyond the obesity barrier to proper cervical cancer screening.

- <sup>1</sup> Adams EK, Florence CS, Thorpe KE, Becker ER, Joski PJ. Preventive care: female cancer screening, 1996-2000. *Am J Prev Med.* November 2003;25(4):301-307.
- <sup>2</sup> Katz SJ, Hofer TP. Socioeconomic disparities in preventive care persist despite universal coverage. Breast and cervical cancer screening in Ontario and the United States. *JAMA.* August 17, 1994;272(7):530-534.
- <sup>3</sup> Modesitt SC, van Nagell JR Jr. The impact of obesity on the incidence and treatment of gynecologic cancers: a review. *Obstet Gynecol Surv.* October 2005;60(10):683-692.
- <sup>4</sup> Wee CC, McCarthy EP, Davis RB, Phillips RS. Screening for cervical and breast cancer: is obesity an unrecognized barrier to preventive care? *Ann Intern Med.* May 2, 2000;132(9):732-734.
- <sup>5</sup> Fontaine, KR, Heo M, Allison DB. Body weight and cancer screening among women. *J Womens Health Gend Based Med.* June 2001;10(5):463-470.
- <sup>6</sup> Østbye T, Taylor DH Jr, Yancy WS Jr, Krause KM. Associations between obesity and receipt of screening mammography, Papanicolaou tests, and influenza vaccination: results from the Health and Retirement Study (HRS) and the Asset and Health Dynamics Among the Oldest Old (AHEAD) Study. *Am J Public Health.* September 2005;95(9):1623-1630. Epub July 28, 2005.
- <sup>7</sup> Wee CC, Phillips RS, McCarthy EP. BMI and cervical cancer screening among white, African-American, and Hispanic women in the United States. *Obes Res.* July 2005;13(7):1275-1280.
- <sup>8</sup> Datta GD, Colditz GA, Kawachi I, Subramanian SV, Palmer JR, Rosenberg L. Individual-, neighborhood-, and state-level socioeconomic predictors of cervical carcinoma screening among U.S. black women: a multilevel analysis. *Cancer.* February 1, 2006;106(3):664-669.
- <sup>9</sup> Ferrante JM, Chen PH, Jacobs A. Breast and cervical cancer screening in obese minority women. *J Womens Health (Larchmt).* June 2006;15(5):531-541.
- <sup>10</sup> Schoenberg NE, Hopenhayn C, Christian A, Knight EA, Rubio A. An in-depth and updated perspective on determinants of cervical cancer screening among central Appalachian women. *Women Health.* 2005;42(2):89-105.
- <sup>11</sup> Amy NK, Aalborg A, Lyons P, Keranen L. Barriers to routine gynecological cancer screening for White and African-American obese women. *Int J Obes (Lond).* January 2006;30(1):147-155.
- <sup>12</sup> BRFSS, Behavioral Risk Factor Surveillance System, [www.cdc.gov/brfss](http://www.cdc.gov/brfss).

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