A View of Asthma in Oregon

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"Overweight and obesity may soon cause as much preventable disease and death as cigarette smoking . . . People tend to think of overweight and obesity as strictly a personal matter, but there is much that communities can and should do to address these problems."

David Satcher, MD,
The Surgeon General's
Call to Action to Prevent and
Decrease Overweight and Obesity,
2001

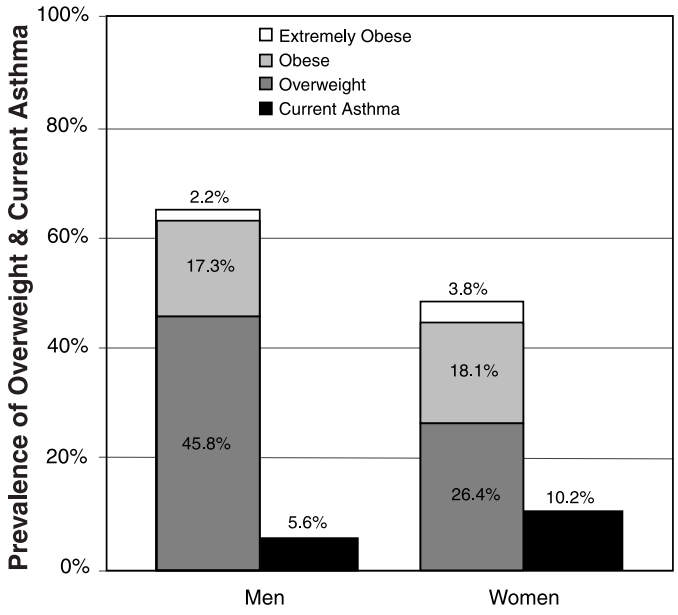
Asthma and Obesity: Bizarre Bedfellows or Causal Co-morbidities?

The Twin Peaks of Asthma and Obesity

Asthma and obesity[1] have become increasingly common in Oregon and elsewhere in the U.S., and each has become commonly recognized as a public health concern. In 2001, 7.9% of Oregon adults 18 to 55 reported having current asthma. During the same time, 36.3% of Oregonians aged 18 to 55 were overweight, 17.7% were obese, and 3.0% were extremely obese. There were substantial differences in the prevalence of these conditions between men and women (Figure 1).

Nationwide, the prevalence of obesity has increased significantly since the 1970s, and the prevalence of asthma has followed a similar path since the 1980s.[2] Many experts consider each condition an epidemic. This raises a question: could these trends be related to one another? In this publication, we review the evidence for such a relationship.

Figure 1. Prevalence of Adult Overweight and Current Asthma by Gender, Oregon, 2001



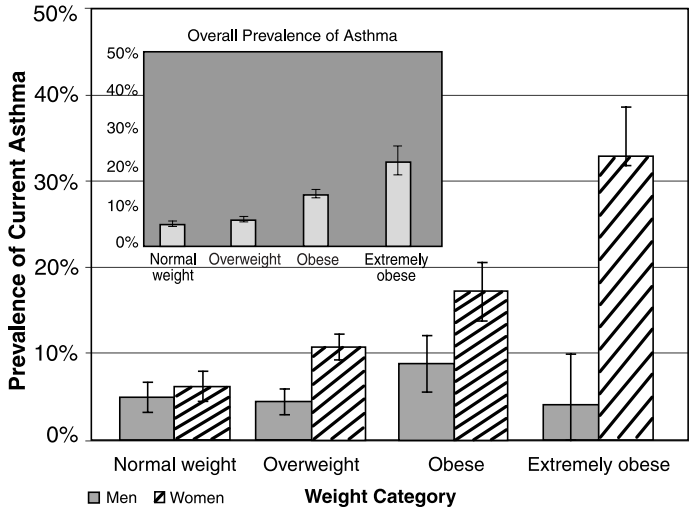
1. A person is obese if his or her BMI (body mass index) is ≥ 30 (kg/m2). By these criteria, a 5'4" person who weighed 174 or more pounds would be obese. Extreme obesity, defined as BMI ≥ 40, corresponds to a 5'4" person weighing over 232 pounds. Conversely, a 5'4" person who weighed 108 to 145 pounds would be considered normal.

2. It should be noted that these trends may have begun even earlier – these dates only indicate when they first began to be measured on a population-wide, consistent basis.

Asthma and Obesity: A Tangled Twosome

To figure out whether asthma is associated with obesity in Oregon, we looked at asthma status by body mass index (BMI) among Oregonians.[3] Increased BMI was associated with increased prevalence of asthma in the general population. However, the results become even more striking when we consider men and women separately. In women, the asthma prevalence was 1.8 times higher in overweight women, 3.2 times higher in obese women, and 7.5 times higher in extremely obese women compared to normal weight (Figure 2). All results were statistically significant ($p<.05$). Among men, those in the obese group had 1.9 times higher asthma prevalence ($p<.05$) compared to the normal weight group, but prevalences for the overweight and extremely obese groups were not significantly different.

Figure 2. Prevalence of Adult Asthma by Obesity Status, Oregon, 2001



Many studies have found that asthma and obesity are associated; most found the association in women only. The majority of studies have looked at people at one point in time, so it is not possible to tell whether the asthma or the obesity came first. However, two recent studies that followed large groups of adults for a number of years clarify this issue. They looked at groups of obese and normal weight individuals who did not have asthma at the start, and monitored for development of asthma. One study was among women only, and the other included men too. The study that included men did not find an increased risk of asthma in obese men. Conversely, the risk of developing asthma was two to four times higher in obese compared to normal weight women. In fact, one study showed that women who had gained 22 pounds or more since age 18 had 1.4 to 2.5 times the risk of developing asthma during the study period (p for trend <.001). Because these women did not have asthma at the start of the study, having asthma could not have caused their obesity.

These studies reveal that, for women, as BMI increases so does the likelihood of developing asthma. These data alone are not sufficient to prove that obesity causes asthma, but suggest the possibility of a causal relationship in women.

Is Losing Weight A Strategy for Asthma Control?

Whether or not obesity causes asthma, at least one small study demonstrated that weight loss in obese asthmatics can result in significant improvements in lung function. This study is important because objective criteria were used to diagnose asthma at the start of the study, rather than relying on participant self-report. Researchers saw improvements in pulmonary function tests in the weight loss group compared to a control group. These results were immediate and sustained. There was no non-asthma obese comparison group in the study, however, so the results may represent more general improvements in breathing that any obese person – whether they have asthma or not – might experience upon weight loss. Nevertheless, the results are interesting and the topic warrants further study.

3. We conducted simple logistic regression to estimate the odds ratio (OR) of having asthma based on BMI category, using normal weight as the reference category.

Weight-Related Behaviors Among Oregonians

Although the link between obesity and asthma has not yet been completely illuminated, enough evidence exists to suggest that weight maintenance and weight loss are important strategies for reducing the burden of asthma, just as they are for diabetes, cardiovascular heart disease, arthritis, hypertension, and other increasingly common chronic diseases. With that in mind, we investigated how people who have and who do not have asthma are doing when it comes to the weight-related behaviors of eating healthfully and getting sufficient physical activity.

Among individuals with current asthma and at least normal body weight, more reported the intention to maintain or lose weight than engaged in the activities to do so. Seventy-four percent of women reported trying to lose weight, and of the remaining women, 67% were trying to maintain their weight. However, only 19% of women with asthma reported consuming at least five servings of fruits, vegetables, or fruit juice per day, and 34% reported getting recommended[4] levels of physical activity. Men reported less weight-attentive behavior: 45% were trying to lose weight, and of the remaining, 44% were trying to maintain weight. Men with asthma aligned their healthy behaviors somewhat better with their intentions: 18% consumed at least five servings of fruits, vegetables, or fruit juice per day, and 50% achieved recommended levels of physical activity.

A recent study looked at weight-loss practices and receipt of weight-loss advice among obese people with asthma. In order to lose or maintain weight, 75% of people with asthma tried to reduce their caloric or fat intake, and 58% tried to increase physical activity. Thirty percent reported using the recommended combination of caloric or fat intake reduction and physical activity of ≥ 150 minutes/week. Sixteen percent of overweight participants and 45% of obese participants with asthma reported receiving advice to lose weight at some point during the 12 months prior to the interview. This advice seemed to pay off: obese people who received advice reported attempting to lose weight more often than those who did not receive advice.

Oregonians who do not have asthma fare no better than their counterparts with asthma when it comes to weight-related behaviors. Forty-four percent of women and 39% of men reported attaining recommended levels of physical activity. Twenty-two percent reported consuming at least five servings of fruits, vegetables, or fruit juice per day. Clearly, most adult Oregonians could be doing more to maintain or lose weight.

Conclusion

Data from the 2001 BRFSS indicate a strong association between being overweight or obese and asthma prevalence among women in Oregon. These findings are consistent with other studies, which have found asthma prevalence to be two to five times higher in obese subjects. While our results were similar for overweight and obese women, the magnitude of the association was much higher for the extremely obese group. However, only one of the prior studies separately evaluated women in the extremely obese category. Thus it is possible that others would have found a higher magnitude of association if they had specifically evaluated this group.

Some researchers think that obese women are more likely to get diagnosed with asthma than non-obese women, even when they do not have it. This could result when possible symptoms of asthma, such as shortness of breath, occur in non-asthmatic obese persons, and these are mistaken for asthma. It is not clear whether this is contributing to overestimation of asthma in obese women. In any case, the gender difference is remarkable. Some have suggested that the difference reflects the fact that women have smaller airways. But we also know that women have more airway hyperreactivity than men, which points to additional factors. Further evidence exists linking estrogen to asthma, and obese women have higher levels of circulating estrogen than normal weight women.

4. Moderate or vigorous physical activity for 30 minutes/day x 5 days/week.

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What You Can Do To Help

Although the relationship between obesity and asthma is not yet completely understood, we do know that obesity is a growing problem in Oregon and that it is associated with increased mortality, diabetes, cardiovascular disease, cancer, and overall healthcare costs. The prevention and treatment of obesity are top health priorities for Oregon, which may decrease the burden of asthma, as well a host of other chronic diseases.

Weight gain is a result of caloric intake exceeding expenditure. The best way to prevent or treat obesity is to reduce caloric intake and increase physical activity.[5] Individuals can reduce portion sizes, eat five to nine fruits and vegetables per day, and incorporate physical activities like walking and bicycling into their daily routines. People with asthma can and should engage in regular, vigorous exercise, although consulting with a physician first is warranted for anyone who has previously been inactive. Among people with asthma, several small studies have demonstrated that regular exercise improves cardiopulmonary fitness, and may help improve asthma symptoms. As physicians, parents, employers, community members, city planners, and policy makers, we all have a role in preventing obesity. Creating an environment in which individuals can easily make healthy choices will be essential in helping more Oregonians to achieve healthy weight.

References for this publication are available upon request.

This issue is based on work done by OHSU preventive medicine resident Selvi Williams, MD through an internship in the Oregon Asthma Program.

Methodology: Oregon data in this report are derived from the 2001 Behavioral Risk Factor Surveillance System (BRFSS), a survey of health behaviors among Oregonians ≥ 18 years old. Only respondents age ≤55 years old were included to reduce the likelihood of participants having chronic obstructive pulmonary disease (COPD). People with current asthma were identified as those who answered "yes" to both of the following questions: "Have you ever been told by a doctor, nurse, or other health professional that you had asthma?" and "Do you still have asthma?" BMI categories for normal weight, overweight, obese, and extremely obese were defined as follows: ≥ 18.5 to < 25, ≥ 25 to < 30, ≥ 30 to < 40, and ≥ 40, respectively.

5. Most people with asthma can exercise normally if their asthma is well-controlled. Please consult with your doctor if you have asthma and want to be more physically active.