BRIEF REPORT: Identification and Management of Overweight and Obesity by Internal Medicine Residents

Christopher B. Ruser, MD,[1,2] Lisa Sanders, MD,[2] Gina R. Brescia, MD,[1,2] Meredith Talbot, MD,[2] Karl Hartman, MD,[3] Kathleen Vivieros, MD,[4] Dawn M. Bravata, MD[1,2,5]

[1]Department of Medicine, Veterans Affairs Connecticut Healthcare System, West Haven, Conn, USA; [2]Department of Medicine, Yale University Medical School, New Haven, Conn, USA; [3]Department of Medicine, Waterbury Hospital, Waterbury, Conn, USA; [4]Department of Medicine, University of California, San Diego, Calif, USA; [5]Clinical Epidemiology Research Center, Veterans Affairs Connecticut Healthcare System, Conn, USA.

BACKGROUND: Obesity is a major cause of morbidity and mortality in the United States.

OBJECTIVE: To assess how frequently Internal Medicine residents identify and manage overweight and obese patients and to determine patient characteristics associated with identification and management of overweight compared with obesity.

DESIGN: A cross-sectional medical record review.

PATIENTS: Four hundred and twenty-four overweight or obese primary care patients from 2 Internal Medicine resident clinics in Connecticut.

MEASUREMENTS: Measurements included the frequency with which obese and overweight patients were identified as such by their resident physicians, patient demographics, and co-morbid illnesses, as well as use of management strategies for excess weight.

RESULTS: In this population of obese and overweight patients, obese patients were identified and treated more often compared with overweight patients (76/246%, 30.9 vs 12/178%, 7.3 for identification, $P=.001$, and 59/246%, 24.0 vs 11/178%, 6.2% for treatment, $P=.001$). Overall, only 70/424 (17%) of patients received any form of management. Only higher body mass index (BMI) (BMI $\geq 30\,\mathrm{kg/m^2}$ compared with BMI $25–29.9\,\mathrm{kg/m^2}$) was independently associated with identification of overweight or obesity (odds ratio 7.51%, 95% confidence interval [CI] 3.76 to 15.02) or with any management for excess weight (odds ratio 4.79%, 95% CI 2.44 to 9.42).

CONCLUSIONS: Our results suggest that Internal Medicine residents markedly underrecognize and undertreat overweight and obesity.

O verweight and obesity are major causes of morbidity and mortality in the United States, accounting for an estimated 400,000 deaths annually.[1–3] Beginning in 1998 with the publication of the National Institute of Health (NIH)/ National Heart, Lung, and Blood Institute (NHLBI) Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults, several professional organizations have recommended practices to improve the recognition and treatment of obesity, prompted in part because of a perception that overweight and obesity were not receiving adequate clinical attention.[4–6] For example, 1 study found that obesity was reported as either a problem or diagnosis in only 8.6% of 55,000 physician visits in 1995 to 1996, despite markedly higher prevalence estimates.[7]

The extent to which the NIH guidelines have been integrated into current clinical practice is unknown. Our goal was to assess in this postguideline environment (1) how frequently Internal Medicine residents identify and manage patients who are overweight or obese, and (2) to identify the patient characteristics that are associated with the identification or management of overweight and obesity.

METHODS

Setting

This study was designed as a cross-sectional medical record review of overweight and obese patients in the 4 resident clinics of the Yale Internal Medicine Residency Programs: (1) Chase Clinic, Waterbury Hospital, Waterbury, Conn; (2) The Family Health Center, St. Mary's Hospital, Waterbury, Conn; (3) The Primary Care Center, Yale–New Haven Hospital, New Haven, Conn; and (4) The VA Connecticut Healthcare System Primary Care Clinic, West Haven, Conn. All 4 are large, academically affiliated, group practices that care for patients from predominantly low to middle socioeconomic status.

Inclusion Criteria

The study included a 5% random sample of patients with ≥ 1 "primary care" visit between September 1, 2001 and July 31, 2002. "Primary care" visits were defined as routine visits with the provider assigned as that patient's primary clinician, specifically for health maintenance or chronic illness follow-ups, and not for urgent care.

Patients were included if they were classified as overweight if their body mass index (BMI; weight in kilograms divided by height in square meters) was $\geq 25\,\mathrm{kg/m^2}$, or obese if their BMI was $\geq 30\,\mathrm{kg/m^2}$. This determination was based on heights and weights recorded in the medical records. Two clinic sites (Chase Clinic and The Primary Care Center) were excluded from the study because of failure to consistently document height or weight during the study period.

Exclusion Criteria

Patients were excluded if they were born before 1938, were neither overweight nor obese (BMI $<25\,\mathrm{kg/m^2}$), had a life ex-

pectancy <6 months, or if no "primary care" visit occurred during the study period.

Methods of Medical Record Review

The medical record data were collected using a data collection tool designed and pilot tested specifically for the current study. Data collection was conducted unblinded to the study questions. A random sample of 5% of the medical records was double abstracted; the inter-rater reliability was >99% for all of the collected data elements.

Patient Characteristics. Patient characteristic data included demographics (i.e., age, race, gender), height, weight, co-morbidities (i.e., hypertension, hyperlipidemia, depression, diabetes, osteoarthritis, coronary artery disease, obstructive sleep apnea [OSA], hypothyroidism, prostate cancer, breast cancer, colon cancer, polycystic ovary syndrome), and habits (i.e., smoking, alcohol use >2 drinks/day for men or >1 drink/day for women).

Identification of Overweight or Obesity. Medical records were reviewed for the frequency with which overweight or obese patients were identified as such by Internal Medicine residents. Specifically, the past medical history, problem list, or assessment and plan were reviewed for documentation of "BMI," "overweight," "obese," or "weight."

Management of Overweight or Obesity. Primary care visit notes were examined for any documentation of a diagnostic evaluation for overweight or obesity (e.g., thyroid function tests, fasting lipid profiles, fasting glucose measurements) and any therapeutic interventions (e.g., dietary/nutritional counseling; exercise counseling; referral to a nutritionist, pharmacotherapy, or surgeon).

Statistical Methods

Descriptive statistics (means with standard deviations, ranges, and proportions) were used to characterize the patients' baseline characteristics. Chi-square tests and Student's t tests were used to assess differences in baseline characteristics between the obese and overweight patients, and to examine differences in the rate of identification and management of overweight and obesity. Multiple logistic regression analysis was used to identify the patient characteristics that were independently associated with identification and management of excess weight. The characteristics that were included in the multiple logistic regression model were those that were associated with identification or management in the bivariate analysis ($P<.05$) and were included on the basis of a priori clinical judgment (i.e., BMI). All calculations were performed using PC-SAS 8.0 (SAS Institute, Cary, NC) or Microsoft Excel (Microsoft, Seattle, Wash). Statistical significance was accepted at a P value <.05.

RESULTS

Patient Characteristics

A total of 424 patients were included from 2 sites (The Family Health Center, $N=224$, and The VA Connecticut Healthcare System Primary Care Clinic, $N=200$). The mean age was 51 years and the mean BMI was 32.2 kg/m^2 (Table 1, available

Table 2. Identification and Management of Overweight and Obesity

	BMI		
	Overweight or Obese >25.0 N=424 n (%)	Overweight 25.0–29.9 N=178 n (%)	Obese ≥30 N=246 n (%)
Overweight/obesity identified[†]	86 (20.3)	10 (5.6)	76 (30.9)
BMI[‡] documented	9 (2.1)	5 (2.8)	4 (1.6)
Any identification of BMI, overweight, or obesity[§]	89 (21)	13 (7.3)	76 (30.9)
Any management of overweight or obesity	70 (16.5)	11 (6.2)	59 (24.0)
(a) Dietary advice	22 (5.2)	3 (1.7)	19 (7.7)
(b) Nutrition referral	47 (11.1)	8 (4.5)	39 (15.6)
(c) Exercise advice	53 (12.5)	11 (6.2)	42 (17.1)
(d) Bariatric surgery	1 (0.2)	0 (0.0)	1 (0.4)
(e) Behavior modification	6 (1.4)	0 (0.0)	6 (2.4)

[†]*Includes "overweight" or "obesity" being documented in the past medical history, problem list, or assessment and plan.*
[‡]*BMI refers to body mass index (weight [kilograms]/height [meters^2]).*
[§]*Includes documentation of "body mass index (BMI)," "overweight," or "obesity" in the past medical history, problem list, or assessment and plan.*

online). The patients were mostly male (69.4%) and of white or Hispanics race/ethnicity (32.5% and 24%, respectively).

Identification of Obesity and Overweight

Internal Medicine residents identified 13 of 178 (7.3%) of their overweight patients as overweight or obese compared with 76 of 246 (30.9%) of their obese patients ($P=.0001$) (Table 2). BMI was rarely documented in overweight (5/178%, 2.8%) or obese patients (4/246%, 1.6%, $P=.417$). In multivariable analysis, only higher BMI (BMI ≥30 kg/m^2 vs BMI 25–29.9 kg/m^2) was independently associated with identification of overweight or obesity (odds ratio [OR] 7.51%, 95% confidence interval [CI] 3.76–15.02).

Management of Obesity and Overweight

Overall, 70 of 424 (16.5%) received any form of management for excess weight; obese patients received management more often than overweight patients (59/246%, 24.0% vs 11/178%, 6.2%, $P=.001$) (Table 2). Among obesity-related co-morbidities, only OSA was positively associated with management (OSA: 8/23%, 34.8% vs no-OSA: 62/401%, 15.5%, $P=.037$). In contrast, overweight or obese smokers were less likely to have their weight issues addressed than nonsmokers (smokers: 15/136%, 11.0% vs nonsmokers: 55/288%, 19.1%, $P=.037$). Patients who were identified as being overweight or obese were more likely to receive management (identified: 60/86%, 69.8% vs not-identified: 10/338%, 3.0%, $P<.0001$). In multivariable analysis, higher BMI (BMI ≥30 kg/m^2 vs BMI 25–29.9 kg/m^2) was independently associated with any management (OR 4.79%, 95% CI 2.44–9.42).

DISCUSSION

Current guidelines encourage physicians to embrace obesity as an "epidemic" and a chronic illness.[8,4] Evidence suggests that patients who are recognized as obese and counseled may

be more likely to attempt change,[9,10] and as is the case with our study, prior research has demonstrated that physician "diagnosis" most often leads to treatment.[11] Although successful weight loss reduces the risks of diabetes[12] and hypertension[13] and reduces overall mortality,[14] our results indicate that overweight and obesity continue to be underrecognized and undertreated by Internal Medicine residents. Indeed, 2 clinic sites originally included in this study were excluded because of failure to regularly record height and weight. Less than one-third of obese patients and less than one-10th of overweight patients were identified as such in this study. Only patients with the very highest BMIs were likely to have their weight-related issues recognized or treated.

Our results differ from those of McArtor et al.[11] who studied Family Medicine residents in pre-guideline 1992 and found that they identified 52% of their obese patients. In contrast, Stafford et al.[7] observed diagnostic rates 3 times lower than ours. These differences in diagnostic rates may be attributable to differences in methodology, patient populations, or practice setting, specifically, family medicine residents may approach primary care differently than Internal Medicine residents. Nonetheless, publication of practice guidelines and heightened public awareness does not appear to have led to high diagnostic rates, nor have practice guidelines led to the routine use of BMI as a "vital sign."

Medical training, the current model of primary care, and insurance in the United States may better prepare physicians to deal with the results of obesity (e.g., diabetes, hypertension) rather than the weight itself. Excess weight may be viewed as a social, environmental, or behavioral phenomenon, rather than a medical issue. Given limited time, resources, or knowledge, physicians may feel that brief, targeted counseling will do little to address the complexity of an individual patient's weight.

Limitations

Our research findings should be examined within the context of several limitations. First, this study was a medical record review and, therefore, we could not examine actual clinician practice, only documented care. Second, lack of insurance coverage for pharmacotherapy or Surgery, or lack of availability of certain services at specific facilities, may account for some of the underutilization of these therapeutic modalities. Third, these data are drawn from 2 clinics where patients are cared for by medical residents under the guidance of academic Internal Medicine attendings; therefore, these results may not be generalizable to other practice settings.

Conclusions

Our results indicated that Internal Medicine residents markedly underrecognize and undertreat overweight and obesity.

Research must be directed at practical strategies to increase physician recognition of obesity, and diminish both policy- and practice-based barriers to treatment of excess weight.

REFERENCES

1. **Mokdad AHFES, Bowman BA, Dietz WH, Vinicor F, Bales VS, Marks JS.** Prevalence of obesity, diabetes and obesity-related health risk factors. JAMA. 2001;289:76–9.
2. National Diabetes Fact Sheet: General Information and National Estimates on Diabetes in the United States, 2000. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention; 2002.
3. **Mokdad AHMJ, Stroup DF, Geberding JL.** Actual causes of death in the United States. JAMA. 2004;291:1238–45.
4. Executive summary of the clinical guidelines on the identification, evaluation and treatment of overweight and obesity in adults. Arch Intern Med. 1998;158:1855–67.
5. **McTigue KMHR, Hemphill B, Lux L, Sutton S, Bunton AJ, Lohr KN.** Screening and Interventions for Obesity in Adults: summary of the Evidence for the U.S. Preventive Services Task Force.. Ann Intern Med. 2003;139:933–49.
6. **Klein S, Sheard NFAmerican Diabetes A, North American Association for the Study of O, American Society for Clinical N, et al.** Weight management through lifestyle modification for the prevention and management of type 2 diabetes: rationale and strategies. A statement of the American Diabetes Association, the North American Association for the Study of Obesity, and the American Society for Clinical Nutrition. Am J Clin Nutr. 2004;80:257–63.
7. **Stafford RSFJ, Mistra M, Schoenfeld DA.** National patterns of physician activities related to obesity management. Arch Fam Med. 2000; 9:631–83.
8. **Mokdad AH, Serdula MK, Dietz WH, Bowman BA, Marks JS, Koplan JP.** The spread of the obesity epidemic in the United States, 1991–1998. JAMA. 1999;282:1519–22.
9. **Huang J, Yu H, Marin E, Brock S, Carden D, Davis T.** Physicians' weight loss counseling in two public hospital primary care clinics. Acad Med. 2004;79:156–61.
10. **Galuska DA, Will JC, Serdula MK, Ford ES.** Are health care professionals advising obese patients to lose weight? JAMA. 1999;282:1576–8.
11. **McArtor RE, Iverson DC, Benken D, Dennis LK.** Family practice resident's identification and management of obesity. Int J Obes Relat Metab Disord. 1992;16:335–40.
12. **Group DPPR.** Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med. 2002;346:393–403.
13. **Groups ToHPCR.** Effect of weight loss and sodium retention intervention on blood pressure and hypertension incidence in overweight people with high normal blood pressure. Arch Intern Med. 1997;157:657–67.
14. **Gregg EWGR, Thompson TK, Williamson DF.** Intentional weight loss and death in overweight and obese U. S. adults 35 years of age and older. Ann Intern Med. 2003;138:383–9.

Supplementary Material

The following supplementary material is available for this article online:

Table 1. Patient Characteristics.