

Treatment of Obesity in Three Rural Primary Care Practices

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The experience of three rural primary care practices in treating obesity is described. Treatment alternatives utilized include behavior modification with a balanced deficit diet, use of the protein-sparing modified fast in a group setting, and use of this technique in conjunction with behavior modification on an individual basis. The results of these three case studies are evaluated by an index approach as well as the traditional mean pounds lost. Although treatment of obesity is often avoided because of reported low success rates, this study demonstrates that a family physician has more success than previously reported, with one of the sites showing maintenance of weight loss in 84 percent of a selected group of its patients.

Obesity is one of the most common problems seen in primary care practice. Estimates of its prevalence vary from 8 to 25 percent of Americans being 20 percent over their ideal body weight,¹⁻³ depending on the definition of obesity. The Framingham Study, for example, defined obesity as a relative weight of 20 percent or more above the median weight for a given height and sex.² More exact definitions are based on actuarial tables and categorize obesity as mild, moderate, or massive.^{4,5} The cause of obesity is obscure: a variety of theoretical explanations have been based on anatomical, behavioral, endocrinological, neurological, psychological, and social factors.⁶ Comorbidity is common, but these conditions are seldom the cause of the obesity.⁷ At best, obesity should be considered a complicated matrix of an addiction disorder with multiple causes.

At face value the treatment of obesity is obvious: take in fewer calories. The difficulty of sus-

taining such a practice for a long period of time, however, is well recognized. A vast industry of diet foods, low-calorie diets, and anorectic medications exists to combat the problem of obesity. Treatment of obesity, on either an inpatient or an outpatient basis, is seldom successful, especially if maintenance of weight loss is included as a criterion of success.⁶ Most studies cite a 95 percent failure rate.⁵ Because of this low treatment success, many family physicians avoid dealing systematically with their obese patients. This paper presents results of three case studies in rural practices where the physicians have aggressively and systematically treated their obese patients.

Treatment Alternatives and Outcomes

With the exception of treatment of obesity by medications, the major method of handling obese patients in ambulatory care practice involves either behavior modification linked with some type of balanced deficit diet or the use of an unbalanced deficit diet, usually in the form of a supervised fast. By far the more controversial of these is the supervised fast.

The rationale for using fasting techniques is to bring about the rapid loss of a substantial amount

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of weight, thus providing enough positive reinforcement to ensure the continuation of the dieting behavior. According to the proponents of fasting, behavior modification should be used as an adjunct approach for maintenance of weight loss. However, proponents of the use of behavior modification by itself note that the rationale behind this method is to establish a new pattern of eating behaviors and to view small weight losses as a positive reinforcement. Treatment usually involves keeping food diaries, being attentive to food cues, and so on.⁶

Almost all of the studies involving a fasting regimen indicate successful initial weight loss in a high proportion of patients, but maintenance of that loss is less successful.^{8,9} Most of the work has been performed by three investigators, all of whom demonstrate weight loss.¹⁰⁻¹⁵ Only one study, however, investigated the use of the protein-sparing modified fast (PSMF) in an office-based practice, and this study presents no data on which to base conclusive findings.¹¹

Many studies have been reported utilizing the behavior modification approach, and the results are all remarkably similar: approximately 25 percent of the patients were able to lose 20 pounds or more, and only 15 percent were able to lose 40 pounds or more.¹⁶⁻²⁰ Typical of those few studies with a follow-up is a study by Currey and colleagues,²⁰ in which 70 percent reverted to their pretreatment weight or greater, 10 percent maintained the weight achieved through treatment, and 20 percent continued to lose weight during the year.

One of the problems with comparing outcomes is the measure that is used to gauge success or failure. By far the most common measurement is that of percentage of patients who lost a specific number of pounds initially. A second level is to graph this weight loss over the few follow-up visits that are available. A more rigorous measurement is to attempt to define an index on a reference point, such as percent overweight and percent excess lost, both of which include utilization of a standard such as a height and weight chart. Excess weight is usually determined to be the difference between actual body weight and the midpoint of the Metropolitan Life Insurance Tables for medium frame.²¹ In 1960 Feinstein²² suggested using the reduction index, but few studies have taken advantage of this method.

In addition to the measurement used, the litera-

ture on obesity is full of methodological problems, including small sample sizes, high dropout rates, and low follow-up rates. Those that do report follow-up studies almost always report a re-gain of weight.⁵

This article presents the experiences of three rural primary care practices, each of which systematically treats obese patients by use of a fasting technique, behavior modification, or a combination of these two. Although this study is not able to overcome all of the selection biases inherent in studying the problem of obesity, by utilizing a reference point for weight loss, and by following up patients, the results indicate that family physicians should not automatically assume that treatment of obesity will be a failure within their practices.

Methods

Data were collected in three practices, all of which are participants in the Primary Care Cooperative Information Project (COOP), a collection of primary care practices linked through Dartmouth Medical School whose major objective is to devise methods to retain physicians in rural New England. At present there are 50 sites served by 96 physicians, most of whom are family physicians and internists. The practices are linked by a medical information network: all practices collect a common set of information including patient age, sex, diagnosis, and cost data. This minimum data set enables cross-practice studies to be undertaken with little disruption to the practices.^{23,24}

This study was initiated by two practices in the COOP Project that independently requested evaluations of the diets they were currently offering patients. One practice (A) was utilizing the PSMF described by Lindner and Blackburn¹²; the second (B) was utilizing behavior modification techniques with a balanced deficit diet under the direction of the physician in the practice and a nutritionist. In the process of contacting all other practices to determine additional interest in participating in the study, physicians in a third practice (C) indicated utilization of the PSMF and wanted to have their patients evaluated.

Description of the Practices

Practice A is a private, fee-for-service solo practice with approximately 1,000 active patients in an upper-middle-class rural tourist area. This

physician closely follows the regimen described by Blackburn and Lindner,¹² seeing his obese patients weekly at first, then bimonthly, and later monthly in his office in a one-on-one setting. Patients refer themselves to this physician as a result of hearing of his work with obesity. After extensively interviewing the physician and observing him interact with patients, it was clear that he had divided treatment of obesity into two phases: for the initial weight-loss phase he utilized the PSMF, and for the weight-maintenance phase he utilized behavior modification techniques, especially concentrating on habit changes necessary for the future when the diet was terminated.

Practice B is also a private, fee-for-service solo practice in a middle-class suburban area. A relatively new practice, it has about 800 active patients. The physician in this practice works with a nutritionist, who gives balanced deficit diets on an individual basis to obese patients. The nutritionist meets weekly with each patient to do behavior modification techniques. In this practice, the physician commonly refers patients to the nutritionist.

Practice C is a National Health Service Corps site. It has 900 active patients with two physicians. The physicians organized a weekly group meeting for the most obese patients in the practice. The group meetings consisted of a ketone test, weigh-ins, and group discussions about the diet led by a registered nurse. Blood tests and medical supervision were provided by one of the two physicians in the practice.

Sample Selection

All active charts were reviewed in each practice. To be included in this study, there had to be either a note on the chart by the physician indicating a diagnosis of obesity, or a determination of obesity made by the reviewer, who used the large frame weight for the appropriate height from insurance tables. In both cases the number of overweight persons in each practice was underestimated. Table 1 shows that there were 75 charts in practice A, 50 in practice B, and 21 in practice C. From this group, charts were audited only if a patient was actually on a diet or had been on a diet supervised by the physician and the chart had a complete data set, bringing the sample sizes for the comparative analysis to 37 patients in practice A, 31 patients in practice B, and 17 patients in practice C.

Data Collection

Data were gathered by means of a chart audit using a protocol that included age, sex, comorbidity, type of diet, length of time on the diet, weight loss in pounds, laboratory work (including blood samples, electrocardiogram, and urinalysis), family history, educational level, and occupation. Charts were reviewed by a nonphysician who was trained and supervised by a physician. Patient confidentiality was preserved through the use of codes for each patient name. In addition to these chart audits, the reviewer also observed the interaction between patient and physician to provide more qualitative information.

Results

Table 1 shows the number of obese patients in each practice as well as the number of patients ultimately included in the study. In practice C only those patients actually put on a diet, the heaviest of the obese patients, were admitted to the group fasting treatment. Of the three sites, practice A has the greatest proportion of obese people in the practice and actually on a diet as a result of the number of people who refer themselves to this physician for treatment of their obesity. As expected, the majority of patients were women, most of whom had dieted many times before.

The comparative analysis presented here is done only on the patients for whom there is a complete data set, including information on all variables noted in the protocol. This is a substantially smaller number than those determined to be obese because of absence of information on the medical records (Table 1). Table 1 shows analysis of the results by mean weight loss, percent overweight, percent excess lost, and the reduction index.

The mean weight loss is highest in practice C (44.5 pounds). Both fasting sites (A and C) seem to have had a better weight loss than had the behavior modification site, with the group site (C) having had a better weight loss than the patients seen by the solo physician (A).

More weight is lost with the passage of time and an increased number of visits. However, because of attrition, this statement is not so straightforward as one would expect: the combined weight loss with the passage of time is actually due to those very few individuals who go on to achieve the largest weight reduction. The only practice

Table 1. Practice Description and Weight Lost in Each Practice

	Practice A	Practice B	Practice C
Total active practice population	1,000	800	917
Obese patients on diet			
Male	8	15	0
Female	67	35	21
Patients with complete data set			
Male	0	0	0
Female	37	31	17
Age (yr)			
18 to 25	5	5	3
26 to 35	6	10	7
36 to 45	9	8	5
45 and up	17	4	2
Previous diet history*			
None	0	1	NA
One	17	19	NA
Many	20	11	NA
Mean initial weight (lb)	189.5	189.1	258.0
Mean weight loss (lb)	30.0	18.2	44.5
Percent overweight	49.4	49.5	97.7
Percent excess loss**	54.9	30.7	34.4
Reduction index (based on last visit)†	79.6	44.7	67.7
*Based on chart audit			
**P > .001			
†P > .0001			
NA = Not available			

that had enough long-term experience with treatment of obesity was practice A. Of the 37 patients included in this comparative analysis, follow-up data were available for 18. Eighty-four percent of those followed for 3 to 24 months maintained some weight loss, with only three patients re-gaining back to or above their initial weight. Long-term conclusions are not warranted since only four patients had any data after 24 months, although three of these were still below their initial weight.

The patients in practice C were heavier than the dieters from the other two practices (Table 1), making the outcome measure of pounds lost less relevant. All three index measures (percent overweight, percent excess lost, and the reduction index) are more meaningful measures of success. Percent overweight, a comparison of height to weight using the life insurance tables, provides a good measure of how much heavier the dieters are in practice C (97.7 compared with 49.4 and 49.5

percent). Percent excess lost is a proportion of the final weight and the ideal for a given height. The reduction index calculates weight already lost, ideal weight, and weight loss that is still remaining. Table 1 shows a significant difference between the two fasting sites for excess weight lost as well as for the reduction index. In both cases, practice A's patients were more successful.

Additional Results From Practice A

Additional data were available from practice A since this physician had been treating obese patients in the context of his family practice for a significantly longer time. As noted, he not only followed Lindner and Blackburn's use of the PSMF but also included a good deal of behavior modification technique in the weight maintenance phase.

Practice A actually has had 119 patients on this diet, but only 37 active patients were considered in

the comparative analysis, since the other two practices utilized only active patients. This larger group of patients was middle-aged (mean age 41 years) and predominantly female (9:1). The patients had an average of 61 pounds of excess weight. Of this group of 119 patients, 26 (21 percent) are classified as nonresponders, since they kept three or fewer appointments. The mean age of these dropouts was ten years younger than those who completed more than three appointments. The dropouts also had a lower initial weight than those who completed more appointments. They lost an average of 6 pounds during the first week, but dropped out sometime during the second or third week.

Side effects of the diet caused only four of these patients to drop out, all of whom did so during the first week. About one half of those who stayed on the diet experienced some type of side effects, with the vast majority of these being transient and lasting only one or two days. These side effects were attributable to the induction phase of the diet, to dehydration, or to inadequate salt intake. The most frequent complaint was dizziness or lightheadedness, followed by nausea and leg cramps, all of which are attributable to dehydration or salt depletion. Hair loss occurred only twice.

Those who stayed on the diet for more than three visits lost an average of 23 pounds, which nearly equals the mean weight loss achieved by Lindner and Blackburn.¹²

Discussion

Analyzing the effectiveness of treatment of obesity is an extremely difficult task, and this article has several limitations common to those found in other literature in this area.

The major focus of this article has been those patients who have been on a diet within the last year. By setting standards for number of appointments in practice A (at least five) and by looking only at those patients actually on diets in practices B and C, those who are least successful are automatically excluded. In practice A, for example, 39 patients had fewer than five visits, with a mean weight loss of 13 pounds, none of whom were included in the comparative analysis of this paper. Also, those patients in practice A who were not in ketosis for at least two visits were excluded, which excluded 10 patients, who lost an average of 10 pounds. The average weight loss for those in-

cluded from practice A was 30 pounds, which although it addresses the efficacy of the diet, does not address the determinants of success. Many patients on a diet were excluded from the study because their charts did not have a complete data set (Table 1). In retrospect, this failing is one of design as well as completeness of the medical record, since the original protocol contained measurements on far too many variables, most of which were intended to help resolve issues of theoretical interest in the literature. This loss of patients in practice A serves to underestimate the success of this physician in treating obesity, and it is likely that the success of practice B is also underestimated.

As with most other studies, only women were included in this analysis because of a lack of male patients. There were no men at practice C and only 14 and 12 at practices A and B, respectively. The mean weight loss for the men at practice A was 18.9 pounds and for practice B, 18.2 pounds.

This study does not provide data that can be generalized to all primary care practices. According to the data system of the COOP project, it was determined that the three practices studied are not typical of the regional network of practices. A shortened version of the protocol was utilized in three additional practices similar in number of patients and in the frequency with which obesity appears on their common encounter form. Practice A attracted more obese patients, and all three practices that participated in the study were more likely than any of the other three "control" practices to put their obese patients on a diet. For example, out of 58 identified obese patients in the comparison practices, only 2 were on a diet. Also, these additional three practices were more likely to have data needed to do a chart review of obese patients missing from their records. In discussions with the three additional physicians, each noted mentioning the idea of weight loss to heavy patients, but there was no such documentation in their records. In fact, since in many of the charts no height was listed, it would be impossible ever to analyze the results using any index figure. Physicians at these additional sites tended to prescribe a diet only in the presence of specific comorbidity or if a patient requested it. Obviously the three practices that contributed to this study have a special interest in treating obesity; indeed, the physician in practice A routinely receives referrals from his colleagues. These results, therefore, do not apply

to all primary care practices, but they do reveal what a primary care provider could accomplish if he or she wished to treat obesity systematically.

Conclusions

In spite of the limitations of this study, which are common to the problem being investigated, this study demonstrates that a family physician who decides to deal systematically with obese patients in his or her practice can expect a higher rate of success than indicated in the literature. The results for the physician in practice A (mean weight loss of 30 pounds with 84 percent maintaining a weight loss) are comparable to what Linder and Blackburn achieved at their weight-loss clinic with a group of selected, highly motivated patients.¹³ Because of the limitations of the sample selection, it is highly likely that the success rate is underestimated in each practice.

The results of this study also demonstrate that the appropriate measure of success is not mean pounds lost, since this gives rise to misleading results. Some index measure, either percent excess lost or, preferably, the reduction index, is necessary. The practical implication of this decision is the necessity of including more information on the medical record. If the protocol includes only the minimum variables of height, current weight, and ideal weight, this data requirement is not burdensome. Certainly, a protocol as detailed as the one used in this study is not necessary.

It is premature to try to address the relative merits of treatment alternatives for obesity. This study, by presenting essentially three case studies, cannot hope to define the best treatment for obesity. However, the results of this study do suggest that primary care physicians are uniquely suited to treat obesity, since they are more likely to be able to maintain contact with their patients. This continuity may account for the success of the physician in practice A. Rather than ignoring this major health problem, the family physician has a valuable role to play in increasing the successful treatment for the morbidly obese patient.

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References

1. Bray GA: The Obese Patient. Philadelphia, WB Saunders, 1976
2. Abraham S, Johnson CL: Prevalence of severe obesity in adults in the United States. *Am J Clin Nutr* 33:364, 1980
3. Swanson DE, Dinelto FA: Severe obesity as a habituation syndrome. *Arch Gen Psychiatry* 22:120, 1970
4. Danowski T: The management of obesity. *Hosp Pract* 11(4):39, 1976
5. Stunkard A, McLaren-Hume M: The results of treatment of obesity. *Arch Intern Med* 103:79, 1959
6. Brightwell D, Clancy J: Self-training of new eating behavior for weight reduction. *Dis Nerv System* 37(2):85, 1976
7. Solomon N: The study and treatment of the obese patient. *Hosp Pract* 35:90, 1969
8. Johnson D, Drenick E: Therapeutic fasting in morbid obesity. *Arch Intern Med* 137:1381, 1977
9. Vertes V: Supplemented fasting: A perspective. *Drug Ther* 8(9):73, 1978
10. Bistrian B: Clinical use of a protein-sparing modified fast. *JAMA* 240:2299, 1978
11. Willard MD, Griffith HW, Harrison GG, Roberts WL: The protein-sparing modified fast: Its place in office practice. *J Fam Pract* 6:659, 1978
12. Lindner PG, Blackburn GL: Multidisciplinary approach to obesity utilizing fasting modified by protein-sparing therapy. *Obes Bariatric Med* 5(6):198, 1976
13. Bistrian BR, Blackburn GL, Stanburg JB: Metabolic aspects of a protein-sparing modified fast in the dietary management of Prader-Willi obesity. *N Engl J Med* 296:774, 1977
14. Bistrian BR, Blackburn GL, Glatt JP: Nitrogen metabolism and insulin requirements of obese diabetic adults on a protein-sparing modified fast. *Diabetes* 25:224, 1976
15. Bistrian BR, Winterer J, Blackburn GL: Effects of a protein-sparing diet and brief fast on nitrogen metabolism in mildly obese subjects. *J Lab Clin Med* 89:62, 1977
16. Penick S, Tilion R, Fox S, Stunkard A: Behavior modification in the treatment of obesity. *Psychol Med* 33:49, 1971
17. Roberts C: Psychological treatment of obesity with phentermine resin as an adjunct. *Am J Psychol* 135:936, 1978
18. Miller DC: Treatment of obesity in family practice. *J Fam Pract* 6:761, 1978
19. Dahms W, Molitch ME, Bray GA, Greenway FL: Treatment of obesity: Cost-benefit assessment of behavioral therapy placebo and two anorectic drugs. *Am J Clin Nutr* 31:774, 1978
20. Currey H, Malcolm R, Riddle E, Schachte M: Behavioral treatment of obesity: Limitations and results with the chronically obese. *JAMA* 237:2829, 1977
21. Atkinson RL, Greenway FL, Bray GA, et al: Treatment of obesity: Comparison of physician and non-physician therapists using placebo and anorectic drugs in a double-blind trial. *Int J Obes* 1:113, 1977
22. Feinstein AR: The treatment of obesity: An analysis of methods, results and factors which influence success. *J Chronic Dis* 2:349, 1960
23. Nelson EC, Kirk JW, Bise BW, et al: The Cooperative Information Project: Part 1: A sentinel practice network for service and research in primary care. *J Fam Pract* 13:641, 1981
24. Nelson EC, Kirk JW, Bise BW, et al: The Cooperative Information Project: Part 2: Some initial clinical, quality assurance and practice management studies. *J Fam Pract* 13:867, 1981