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Bone Loss in Anorexia Nervosa: Mechanisms and Treatment Options

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Anorexia nervosa and related eating disorders affect up to 1% of college-age women in the United States.^{1,2} Bone loss is significant among women with anorexia nervosa: more than half of these patients have bone densities greater than two standard deviations below age- and gender-matched normal means.^{3, 4, 5} Each standard deviation below the mean approximately doubles the risk of fractures.

The young age at onset and the rapidity of bone loss in patients with anorexia nervosa are particularly striking. Bone loss can be detected after only 6 months of illness, and symptomatic compression fractures and kyphosis (spinal deformity) are not uncommon in this young population.⁶ The long-term consequences of bone loss associated with anorexia nervosa are not known, but a residual deficit can remain after weight recovery.⁶

Mechanisms of anorexia-related bone loss

The etiology of the bone loss associated with anorexia nervosa is not known; however, substantial progress has been made toward a more complete understanding of the mechanisms of anorexia-related bone loss. A number of different factors may contribute to bone loss in anorexia nervosa, including estrogen deficiency and malnutrition. Bone density correlates with

the duration of amenorrhea in women with anorexia nervosa,^{4,6} and estrogen deficiency accompanies other states associated with decreased bone density, such as menopause and hyperprolactinemia.^{7, 8} The degree of bone loss seen in anorexia nervosa, however, is unique in its severity compared to these other low-estrogen states.^{9, 10} In a recent study that compared age-matched patients with hypothalamic amenorrhea and anorexia nervosa, the severity of bone loss was significantly greater in the patients with anorexia nervosa, even though both groups had similar degrees and duration of estrogen deficiency.¹¹

Estrogen therapy: Still a major question

Whether or not estrogen replacement therapy is an effective therapeutic option for the bone loss associated with anorexia nervosa remains a major question. In a randomized prospective study of 48 women followed for a mean of 1.5 years, estrogen/progestin replacement and calcium supplementation did not prevent or

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Update

Looking at Temperament in Anorexia Nervosa

Some have hypothesized that temperament can be used as a potential predictor of binge eating and purging in persons with anorexia nervosa (AN). Kelly L. Klump, PhD, and colleagues at Western Psychiatric Institute and Clinic evaluated temperamental differences of 117 women with purging-type AN, 60 women with binge-purging type AN, and 827 women from the general community (control group) using Temperament and Character Inventory scores. As reported at the Academy for Eating Disorders annual meeting in New York in May, women with AN scored significantly higher on harm avoidance and significantly lower on cooperativeness than controls did. When the AN subtypes were examined, women with restricting-type AN and purging-type AN reported the lowest degree of novelty-seeking behavior, and purging-type anorexics had the highest degree of harm avoidance. The subgroup with restricting-type AN scored the highest on persistence and self-directedness. Body mass index had only a nominal effect on differences among groups, suggesting that subtle temperamental differences occur independently of body weight.

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reverse bone loss in women with anorexia nervosa.¹² In a subanalysis among patients with severe weight loss (those who weighed less than 70% of ideal body weight, or IBW) estrogen/progestin prevented bone loss but did not increase bone density. Nonetheless, primary care providers often prescribe estrogen replacement for young amenorrheic low-weight women. The overall inadequacy of estrogen therapy in anorexia nervosa stands in marked contrast to its efficacy in preventing bone loss in postmenopausal women. The data suggest other factors contribute to the bone loss associated with anorexia nervosa.

Elevated cortisol levels, excess physical activity, and decreased calcium intake may also contribute to bone loss in anorexia nervosa.¹³ Although patients with anorexia nervosa demonstrate elevated plasma cortisol levels, results of a recent study showed only mild elevations of urine-free cortisol in 22% of women with severe osteopenia.¹⁴ This suggests that although hypercortisolemia may contribute to abnormal bone density in a few patients, it does not account for the significant degree of bone loss in patients with anorexia nervosa. In addition, excess physical activity may contribute to the bone loss that accompanies anorexia nervosa. However, in several studies, physical activity has not been shown to correlate with bone density.^{3, 15} In addition, reduced calcium and vitamin D intake is not associated with low bone density in anorexia nervosa.^{12, 16}

Poor nutrition

Malnutrition itself may be a critical element in anorexia-related bone loss. In women with anorexia nervosa, bone density correlates directly with nutritional indices

such as BMI, caloric intake, fat mass, and leptin levels.^{3, 12} Weight gain correlates with increased bone density in women with anorexia nervosa prior to resumption of normal menstrual function.⁶ Furthermore, short-term fasting, such

as over 4 days, results in a marked decrease of 50% in bone formation markers in healthy normal volunteers.¹⁸

The overall inadequacy of estrogen therapy in anorexia nervosa stands in marked contrast to its efficacy in preventing bone loss in postmenopausal women.

Bone formation and resorption

Recent studies measuring specific markers of bone formation and resorption have provided new information on the mechanisms of bone loss in anorexia nervosa. Bone is in a continuous state of turnover, with new bone formed by osteoblasts (bone-forming cells) and old bone resorbed by osteoclasts (cells that absorb and remove bone tissue).

In women with anorexia nervosa, serum levels of osteocalcin, a marker of bone formation, are significantly decreased in comparison with the levels in age-matched healthy controls. Also notable is the increased urinary excretion of dextrophenylpyridinoline and N-telopeptide among women with anorexia nervosa, indicative of increased bone resorption.¹⁴ There is a reduction of bone formation in anorexia nervosa as well as increased bone resorption, whereas other estrogen-deficient conditions only feature increased bone resorption. This pattern of bone turnover, with reduced bone formation and increased bone resorption, is in contrast to that seen in other estrogen deficiency states. Reduced osteocalcin levels correlate with weight, suggesting an important role of nutrition in the pathogenesis of anorexia-nervosa-related bone loss.

Insulin-like growth factor deficiency

Deficiency of insulin-like growth factor I (IGF-I) may contribute to

the decreased rate of bone formation and osteopenia seen in anorexia nervosa. IGF-I is a nutritionally dependent hormone that both stimulates and reduces deoxyribonucleic acid (DNA) and collagen synthesis.^{19, 20}

Patients with anorexia nervosa are markedly IGF-I deficient. Serum levels of IGF-I decrease with weight loss, increase with weight recovery and, importantly, can be used to predict bone loss.^{12, 14, 21, 22}

Short-term studies have shown that administration of recombinant human insulin-like growth factor (rhIGF-I) increases the markers of bone formation and at low doses does not stimulate bone resorption. IGF-I may therefore be a useful therapy to address the unbalanced rate of bone turnover that accompanies anorexia nervosa.¹³

Recommendations

At the current time, primary care providers should recommend that their female patients with anorexia nervosa take calcium supplements, 1000 to 1500 mg per day, and a daily multivitamin containing 400 international units of vitamin D. The decision as to whether to supplement estrogen should be made on an individual basis.

Despite the lack of effective therapies, bone density measurement is an important assessment for these patients. With the results, clinicians can identify and advise patients whose bone densities are below the fracture threshold. This assessment also provides a valuable opportunity to counsel the patient on the long-term consequences of low weight and the benefits of weight gain.

Currently, there are few treatment options. Antiresorptive therapies used to reduce bone loss in postmenopausal women, such as with the bisphosphonates, may not be effective for patients with anorexia nervosa. These medications do not stimulate bone formation and their role in anorexia nervosa is still unclear.²³ In contrast, weight gain is associated with increased bone turnover and improved bone density. Thus,

nutritional counseling for at-risk patients is an important therapeutic strategy to minimize bone loss in this population.

Significant progress has been made in the understanding and treatment of anorexia-related bone loss. In addition to weight gain, novel strategies to stimulate bone formation may be appropriate for affected patients. Research on the use of these factors, including IGF-I, is ongoing.

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Motivational Interviewing

An Interview with Eileen Stellefson, MPH, RD, FADA

Motivational Interviewing (MI) is a counseling technique that can be used to help clients recognize problems and then make informed decisions about whether or not they want to work on change.¹

The goal of MI is to help the client identify reasons to work toward change. To meet this goal, care providers are encouraged to adopt a curious and empathic stance, at the same time highlighting options for the client and emphasizing that the client is ultimately responsible for change.

MI stems from Prochaska and DiClemente's theory about how people change, namely the Transtheoretical Model of Change.² According to this model, individuals progress through five "stages of change" and use different cognitive and behavioral "processes of change" when attempting to alter problem behaviors. The five stages of change are: 1) *pre-contemplation* (being unaware of a problem, or being aware of it but not wanting to change); 2) *contemplation* (seriously thinking about change); 3) *preparation* (inconsistently taking action); 4) *action* (consistently working on change); and 5) *maintenance* (working on relapse prevention). The idea that motivation fluctuates as a function of an exchange between two (or more) individuals led to the development of MI.¹

MI and stages of change have been applied to many different populations, particularly patients with addictive behaviors. Recently, Eileen Stellefson emphasized the use of this counseling style with eating disorders in her manual, *Winning the War Within: Nutrition Therapy for Clients with Anorexia and Bulimia Nervosa*.

This past summer I had the opportunity to interview Ms. Stellefson. I was very interested in learning more about her experience with MI and her understanding of

the stages of change construct as it is applied to nutrition counseling of clients with eating disorders.

Why Use MI as a Counseling Technique?

LW: Why do you recommend that nutrition professionals use MI as a counseling technique in their clinical practice with eating disordered clients?

ES: Motivational interviewing is essential when working with clients with eating disorders because the nature of the disease keeps them in conflict between getting better and maintaining their eating disorder.

When I see a client with a cholesterol problem who says, "I just don't care. I don't want to get help," I tell him

to come back when he is ready to change. You can't do that with the client with an eating disorder. Conflict is to be expected.

Determining Readiness to Change

LW: How do you assess a client's motivation or readiness to change her present relationship with food and her eating disorder? How do you determine the stage of change the client is experiencing?

ES: I use open-ended questions and reflective listening skills to assess the client's current motivation and readiness to change, beginning at the initial nutritional assessment. This continues throughout the counseling process. If there is any conflict at all, the client is at least in the contemplation stage. Clients in the *Pre-contemplation* stage of their eating disorder most likely don't believe they have a problem. Although they may express frustration about their preoccupation with food and weight or shame about their eating behaviors, clients are not even thinking about changing. Attempts to persuade the client to eat will usually backfire.

In the *Contemplation* stage, the

client is more willing to consider the problems her eating disorder creates and the possibility of changing some eating behaviors. At this stage, clients often have an equal balance of reasons for and against changing their behavior. In the *Preparation* stage, the client has made the decision to change and is in the process of taking steps to get ready to change her eating behavior. Although the client has made a commitment to change eating behavior in the Action stage, it does not mean change will automatically occur. In the *Maintenance/Relapse* stage the client has been making

successful changes to her eating behavior.

LW: What nutrition counseling strategies do you believe are appropriate

for eating disordered clients at each stage of change?

ES: The most appropriate nutrition counseling strategies in the *Pre-contemplation* stage include: establishing rapport with the client and creating a supportive environment; and assessing the client's motivation, nutrition knowledge, beliefs, thoughts, fears, and physical and nutritional status. The most important activity to do with clients at this stage is to explore the costs and benefits of changing their eating disorder behaviors.

In the *Contemplation* stage, the nutrition professional can help the client by prioritizing and discussing eating behaviors to change; identifying barriers and exploring coping strategies; discussing food records; identifying the client's support system; and reviewing what the client should expect physically and psychologically as she changes her eating behavior. Supporting the client to discontinue or reduce the frequency of purging, or viewing herself in mirrors, or weighing herself are essential nutrition counseling strategies in the *Preparation* stage. This stage is a good time to begin using cognitive-behavioral exercises with clients.

Motivational interviewing helps patients overcome the conflict between getting better and maintaining their eating disorder.

In the *Action* stage, the nutrition professional can reinforce the client's self-confidence and encourage more movement toward healthy eating. Teaching the client behavioral strategies and helping her to increase her sense of self-efficacy is very important at this stage. Although the number of nutrition counseling sessions may decrease during the *Maintenance/Relapse* stage, the nutrition professional should reinforce continued use of the client's coping strategies for ongoing success.

Discussing "what if..." scenarios with clients allows the dietitian to assess problem-solving skills. Care providers need to be concerned about the possibility of relapse at this stage. If the client does experience relapse, the dietitian can help by: exploring her thoughts, fears, and beliefs; providing her with the nutrition information/education; giving her feedback; and responding with empathy.

Reverting to an Earlier Stage of Change

LW: In your experience, have you seen clients revert back to an earlier stage of change (i.e., Is the actual manner of change a simple linear progression through the stages?)? If so, why do you think this occurs?

ES: Clients almost always revert to an earlier stage of change. When this happens, I wonder what else is going on in the client's life (e.g., a stressor or a memory, etc.). In my nutrition counseling session, I might say, "For the last two months you were eating what you knew was the right amount and now you're back to eating less than 1000 Calories a day. It makes me wonder if something else is going on that is causing you to "need" your eating disorder to cope." I also ask the client to explore this with her therapist. In addition, I go back to my notes (it is always good to have the client write down the reasons she wants to eat healthier, and to keep a copy). I remind the client of what she/he told me were her/his reasons for changing and challenge the client on what's different now.

Working with Medically Unstable Clients

LW: How can the nutrition professional use the stages of change model for the client who is medically unstable, requires immediate renourishment, and is in denial of the severity of her illness?

ES: When a client is medically unstable, I use very hard and fast statements and do not focus on long-term counseling strategies. For example, a common statement is "FOOD IS MEDICINE." Period. Usually, when clients are unstable they are not thinking rationally, and it is more frustrating than productive to spend too much time assisting the client in processing information.

LW: I have noticed that a client's readiness to change can vary depending on the eating disorder behavior. I have observed that a client may be in the "action" phase for wanting to change her binge-eating behavior but be in the "precontemplation" phase for motivation to address her restrictive eating pattern. Do you have any insight into this observation?

ES: You are absolutely correct. Often, the client wants to stop bingeing but still wants to be thin and restrictive. She/he may even say, "I want to be healthy but weigh 90 pounds." I often talk to clients about how "incompatible" it is to be thin and healthy. I also talk about how difficult it is to stop binge eating if they are being restrictive. I use the deprivation/binge cycle example to help them see that restricting leads to binge eating. I often present this concept by asking questions, not just stating the concept (e.g., "How do you think your body would react to so few Calories?" They may say, "I might get hungry, but that's okay." Then I would ask, "From what we have talked about, what are the usual consequences when the body gets too hungry?"

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—Linda M. Watts, MA, RD

(Note: Eileen Stelfelson, MPH, RD, FADA, has been working in the field of obesity and eating disorders since 1981. Currently Eileen is a nutrition consultant and counsels clients with eating disorders in a small private practice. Ms. Stelfelson's manual is published by Helm Publishing and is available from Gürze Books: 800/756-7533 or www.bulimia.com.)

Linda Watts, MA, RD, is our new "Nutrition Notes" columnist. Linda is currently a full-time Clinical Dietitian with the Eating Disorders Program, St. Paul's Hospital, Vancouver, BC.

Long-term Prognosis in Anorexia Nervosa

Low body mass index (BMI) at admission for treatment may predict a poor outcome for patients with anorexia nervosa (AN). Professor Wolfgang Herzog reported the results of his 21-year follow-up of 84 consecutively treated female AN patients (*Lancet* 2000;355:721).

A polarization of patients. At the 21-year mark, 50.6% of patients had fully recovered, 10.4% still met full diagnostic criteria for AN, and 15.6% had died from the effects of AN. AN patients had a 10-fold higher mortality rate than age-matched controls. A common denominator among those who died was a low BMI. All patients who died had had a BMI of 13 or less when first referred. Other factors that predicted outcome were severity of psychosocial symptoms when treatment began and weight gain during the first inpatient treatment. Duration of illness before first treatment was the best predictor.

Osteoporosis, renal failure. Low bone mineral density and chronic renal disorders were common at the 12-year follow-up mark. The incidence of osteoporosis among the entire group was 17%. Among those with a poor outcome, bone density was more than 2 standard deviations below normal. Five percent of patients had chronic renal insufficiency that required hemodialysis.

**Contending with
Slimmist Propaganda**

Deadly Persuasion: Why Women and Girls Must Fight the Addictive Power of Advertising

(By Jean Kilbourne. New York: The Free Press, 1999. 366 pp., \$26.00)

Body Wars: Making Peace with Women's Bodies

(By Margo Maine. Carlsbad, CA: Gürze Books, 2000. 307 pp., \$14.95)

Taken as a pair, these two books lay bare the incredibly pervasive, negative influence of advertising indoctrination and try to provide an action plan for those interested in fighting back. We're all drenched by streams of virtually inescapable propaganda that shape our attitudes about our shapes. They contaminate our opinions regarding what really matters in life and affect overvaluations of our physical appearances and specific body parts.

The advertising barrages reduce the weaker, less self-confident, and more anxious among us to victims. These victims then devote much of their waking and even dreaming thoughts, emotions, time, energy, and resources to futile attempts to fulfill the advertisers' insatiable demands. They undertake impossible quests to reach higher and higher, ultimately unattainable and unsustainable, peaks of beauty and perfection. This is all in hopes of being loved, admired, supported and accepted.

Jean Kilbourne's *Deadly Persuasion* is the product of an astute student of media, a sometimes member of the Stone Center circle at Wellesley College, and an award-winning film-maker and public speaker who has previously written about the influence of alcohol and tobacco advertising. Her work has focused on how women are demeaned in advertising and often portrayed as stupid beings whose major purpose in life is to entice men. Using hundreds of magazine and newspaper advertisements to illustrate her points, she brilliantly elucidates the mind-numbing, hypnotic effects of advertising, so subtle

and ubiquitous that we're hardly aware of the multiple liminal and subliminal messages to which we're subjected. And, the advertising is targeted at us in increasingly scientifically tested ways designed to appeal to each of our private egos. Her chapter titles tell the story. Examples: "Buy this 24 Year Old and Get All His Friends Absolutely Free: We are the product"; "In Your Face All over the Place: Advertising is our environment";

"Bath Tissue Is like Marriage: The corruption of relationship," and so on. In "Please, Please, You're Driving Me Wild: Falling in love with food," Kilbourne focuses on the female counterpart of advertising's attempts to foster sexual relations between men and their cars. This is hard-core Haagen-Das. From this point on, her focus is on the steady pounding designed to slim and degrade, to push alcohol, push cigarettes, push addictions as pseudo-solutions to problems of loneliness, isolation, or feeling disconnected: "The More You Subtract the More You Add: Cutting girls down to size." Subtle acts of "clique" violence toward women and even soft-core child porn have increasingly found their ways into contemporary advertising.

Kilbourne finally offers a few perspectives on how public health programs might make use of advertising media as part of a "systems approach" to reverse some of the more perverse trends, as in anti-smoking campaigns. Such "counter-advertising" campaigns might also be successfully aimed at teenage drinking, unrealistic dieting, violence against women and other major social problems. Kilbourne has no illusions. Her counter-advertisements are not simple solutions to complex problems, but they may help change zeitgeists and social climates. Unfortunately, the discussion concerning what might be done to counteract the effects of industrial advertising is the thinnest part of the book. We all know that political action and advocacy are needed. Let's face it: we're fighting billion-dollar industries with huge advertising budgets.

Here's where Margo Maine's book comes in, oriented toward the lay reader, and going a step further by suggesting

action plans for those who "don't want to take it any more." In a very chatty style, she covers many of the problems touched on by Kilbourne that result in negative self-images and self-destructive behaviors by women.

Maine's book basically provides us with concise, pointed, and telling exercises that deconstruct advertising propaganda. She exposes the propaganda memes (self-replicating quasi-infectious cultural ideas analogous to viruses or genes in biology) in which we all marinate and takes them on by means of liberally sprinkled, well-placed propaganda-combating facts and quotes. Her suggested solutions and detailed lists of resources are presented chapter by chapter, offered as tools that individuals fighting with their own demons in the trenches can employ in daily battles. Dislike your body? See the list of "25 Ways to Love Your Body" — affirmations, or positive cognitive implants. Uncertain about your attitudes toward fat and fat people? Take the "Size Acceptance Questionnaire." The "Obesity Quiz: Fact or Fiction," and a self-assessment test on "What Really Happens When We Diet" challenge ignorance and misconceptions. "Ten Ideas to Fight Fashionism" (cute) helps cope with fashion addiction. "How does Violence Affect You?" invites honest self-appraisal about partner and family violence. "Aging Beautifully" guides successful coping over the long haul. Many other themes are covered as well. I particularly liked the sections on schools, sports and ballet. The schools chapter contains a "Weight and Shape Attitude Test for Teachers" and Eating Disorders Awareness Program (EDAP) related program suggestions. The one on sports offers a "Mom and Pop Sports Attitude Quiz" and "Questions about Coaches and Teams." The chapter on ballet includes "Ten Shoulds for Dance Teachers." There's even a chapter for men, including "Questions for Men Wanting to Make Peace with their Bodies" and "How Men can Help Women." All in all, this is an extremely sensible, wise and practical book.

—J. Y.

Both are available from Gürze Books: 800/756-7533 or www.bulimia.com.

Bulimia Nervosa: When Psychotherapy Fails, Fluoxetine Is Worth a Try

When bulimic patients do not respond to psychological treatment or relapse afterward, a course of fluoxetine (Prozac) may be a useful intervention.

Dr. B. Timothy Walsh and associates at Columbia University tested the use of fluoxetine in 22 patients with bulimia nervosa who had not responded to, or who had relapses following, a course of cognitive behavioral therapy (CBT) or interpersonal psychotherapy (*Am J Psychiatry* 2000;8:1332). The patients were randomly assigned to receive a placebo (n=9) or fluoxetine (n=13), 60 mg/day, for 8 weeks.

Fluoxetine had a positive effect on binge eating and purging. The median frequency of binge eating within the previous 28 days declined from 22 to 4 episodes among the fluoxetine treatment group, but increased from 15 to 18 episodes among the group that received a placebo. In addition, purging in the previous 28 days declined from 30 to 6 episodes in the fluoxetine group but increased from 15 to 38 episodes in the placebo group.

In the future, longer-term studies will be helpful, due to the marked relapsing and remitting nature of bulimia nervosa. Also, it is useful to note that the 2 groups of patients were different before treatment was given.

Watch for Hypophosphatemia in Severely Malnourished Anorectic Patients

Severely malnourished patients with eating disorders may be at risk of developing hypophosphatemia following oral refeeding. Hypophosphatemia, defined as serum phosphorus concentrations <2.5 mg/dl, usually appears as a result of refeeding with total parenteral

nutrition, and is much rarer with nasogastric or oral refeeding.

A group at the North Shore University Hospital, Manhasset, NY, advise those who treat severely malnourished patients, either as inpatients or outpatients, to be alert for the development of the refeeding syndrome. It can occur even in patients receiving oral refeeding alone.

The authors reported 3 cases in which hypophosphatemia developed after oral refeeding for anorexia nervosa (*Int J Eat Disord* 2000;28 (2):181). All 3 patients developed significant hypophosphatemia—a low of 0.9 mg/dl in 2 patients and 1.7 mg/dl in the third. The first patient received up to 3000 kcal/day, along with intravenous fluids in the hospital. The other patients ate large amounts of food at home for several days. The authors treated these patients by overall caloric restriction and added dietary phosphorus, which rapidly brought phosphorus levels back to normal.

Predicting Outcome in Bulimia Nervosa

A clinical marker may help clinicians determine which patients with bulimia nervosa being treated with cognitive behavioral therapy (CBT) will have a better prognosis than others. Recently researchers found that patients whose purging had been reduced by 70% one-third of the way through treatment with CBT had a much better outcome than patients who did not significantly change their pattern of purging.

W. Stewart Agras, MD, and colleagues at 3 treatment centers evaluated the pretreatment, course of treatment, and outcome data for 194 women who met the DSM-III-R criteria for bulimia nervosa (*Am J Psychiatry* 2000; 157:1302). The women were treated with 18 sessions of manual-based CBT. The differences between the dropouts and non-dropouts and between recovered and non-recovered bulimics were first examined descriptively, and then

signal detection analyses were used to determine clinically significant cutoff points predicting attrition and abstinence from purging.

Characteristics of dropouts

Dr. Agras and his co-workers found that women who dropped out of therapy had more severe bulimic cognitions and greater impulsivity. In addition, those who were treatment failures had poor social adjustment and a lower body mass index, which may have been a sign of dietary restriction. Early progress in therapy was the best predictor of outcome. Those with a poor treatment outcome did not decrease purging by at least 70% by the sixth treatment session. The early marker enables clinicians to try alternative therapies for bulimics who do not respond to CBT.

Calendar

Eating Disorders Awareness and Prevention (EDAP)
Sixth Annual Coordinators Training Conference

September 14-16, 2000
Scottsdale, AZ
(206) 382-3587

Mass. Eating Disorders Assoc. (MEDA)
September 15, 2000
(617) 558-1881

The Elisa Project
2nd Annual Professional Symposium for the Treatment of Eating Disorders
Friday, October 13, 2000
Southern Methodist University
Dallas, TX
(214)987-1221 • loubob55@hotmail.com

Ophelia Project
October 19-20th, 2000
Gannon University with
St. Vincent's Hospital
Erie, PA
mbaird@velocity.net

Healing In Eating Disorders: Biological, Psychological, Humanistic and Spiritual Dimensions
October 27 & 28, 2000
State Univ. of New York at Stony Brook
Long Island, NY
(631) 444-2094

The Renfrew Center Foundation
Feminist Perspectives in Women's Mental Health
November 9 - 12, 2000
Philadelphia, PA
(877) 367-3383

Questions & Answers

Topiramate: Can It Be Used for Binge Eating and Obesity?

Q: One of my patients recently read something about a new anticonvulsant drug being used for treating eating disorders. Can you provide any information on this? (*J.S., Seattle*)

A: Your patient may be referring to topiramate (Topamax), a medication originally studied for epilepsy that has since been tested for efficacy with several psychiatric disorders. Since medications such as valproate (Depakote and others), carbamazepine (Tegretol), gabapentin (Neurontin) and Lamotrigine (Lamictal), have been found effective in various phases of bipolar disorder, topiramate was tried in patients with bipolar disorders and mood instability.

Early trials showed the medication to be somewhat effective for these mood problems, and some of the patients lost weight. As a result, open trials were conducted on patients with binge eating disorder and obesity, many of whom had some degree of mood instability. In one such trial, nine of 13 patients had moderate to good responses for binge eating symptoms and obesity, and this response was maintained for 3 to 30 months. Seven patients lost more than 5 kg. The dose used was 100-1400 mg/day (average: 492 mg). The higher the dose, the better the patient's response. Three patients had

to stop taking the drug due to side effects (*J Clin Psychiatry* 2000; 61:368).

According to the *Physician's Desk Reference*, the usual recommended daily dose for epilepsy is 400 mg/day; higher doses are often prescribed but are associated with higher rates of side effects. Although side effects are reported to be infrequent, sedation occurs in about 30% of patients, and fatigue is not uncommon at higher doses. Since 70% of the drug is excreted through the kidneys, patients with kidney disease should get lower doses and bear close monitoring.

If this medication proves to be effective in controlled trials, it will be a very welcome addition to the physician's toolkit, since the two medications most commonly used to treat mood instability (lithium and valproic acid) are both associated with weight gain.

— J.Y.

FDA Issues Warning on Thioridazine

The Food and Drug Administration has issued new warnings that contraindicate use of thioridazine (Mellaril) in combination with some serotonin reuptake inhibitors (SSRIs), including the antidepressants fluoxetine (Prozac) and paroxetine (Paxil). It is also contraindicated for use in combination with drugs that prolong the QTc interval, such as propranolol, pindolol (Visken), and fluvoxamine (Luvox).

Thioridazine was first introduced in 1959 as an antipsychotic and anti-anxiety/antidepressive. The drug inhibits the action of dopamine in some brain centers, correcting an imbalance of nerve impulse transmissions thought to be responsible for certain mental disorders.

In the Next Issue

Assessing Readiness and Motivation for Change

By Josie Geller, PhD, St. Paul's Hospital • University of British Columbia

Many individuals with eating disorders typically express, either directly or indirectly, intense ambivalence about change. Recognizing and articulating this ambivalence can avert a number of treatment problems.

PLUS

- **Weight-related Behaviors Among Teens**
- **Maternal Effect on Self-esteem Among Hispanic and Anglo Girls**
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Nibbles, by Hunter

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Osteoporosis and Eating Disorders

If you have an eating disorder, you may be at increased risk of developing bone loss. Although it is very easy to think of osteoporosis as a disease that only affects older persons, about half of young female patients with anorexia nervosa have osteoporosis. Further, about 85% of partially recovered anorexia nervosa patients have bone mineral deficiencies, even if they have regained their periods and are within 10% of ideal body weight.

Patients with bulimia nervosa or eating disorders not otherwise specified (EDNOS) are also at risk of osteoporosis, especially if they have had anorexia nervosa in the past or have had episodes of amenorrhea or significant weight loss. Female athletes who restrict their eating or who have amenorrhea may also be at increased risk of developing bone loss. Also, not only women develop osteoporosis, men with anorexia nervosa are also at risk.

The damage caused by osteoporosis is often silent. Hip fractures are painful and easily detected, but fractures of the lumbar spine may initially be painless. Osteoporosis is, for the most part, a silent, ongoing disorder, discovered only after fractures occur.

What is Osteoporosis?

In osteoporosis, the bones are weakened by loss of bone tissue (a condition called osteopenia, pronounced oste-o-peen-ia), making a person much more susceptible to fractures. Osteoporosis is defined by the World Health Organization as bone mineral deficiency that is 2.5 standard deviations (SD) below the mean peak value in young adults (T score). Osteopenia is a T score between 1 and 2.5 SD below the mean peak value.

Although we think of bone as solid and stable, in reality our bones are constantly being remodeled as bone is reabsorbed and new bone is laid down. In fact, about 10% of the bone in our bodies is replaced each year. Bone mineral mass increases during childhood and adolescence, and near peak bone mass is reached by about age 15. A smaller amount is produced until about age 30; after this, we lose about 1% of our bone mass per year. Bone loss can accelerate at any age, and can do so with excessive weight loss (as in anorexia nervosa) and excessive exercise. Throughout our lives, there is a dynamic balance between bone formation and bone resorption. This balance can be upset by many factors, including lack of adequate nutrition and hormonal influences.

Exercise can also influence bone mineral density. Moderate weight-bearing aerobic exercises, such as walking, can slow bone loss, but very strenuous exercise can speed bone loss.

Diagnosing Osteoporosis

Several diagnostic aids are now available to diagnose osteoporosis. Certain chemicals act as markers of bone formation and bone resorption and can be measured with blood tests. Markers that indicate lower-than-normal levels of bone formation include calcitonin, a hormone secreted by the thyroid gland, and type-1 procollagen carboxy terminal propeptide. Markers of bone resorption that have been found to be increased in women with anorexia nervosa include serum type-1 collagen carboxy terminal telopeptide.

Another helpful blood test measures serum estradiol levels; estradiol is the strongest of the naturally occurring estrogens.

In women at risk, an x-ray test can clearly show bone loss. Dual energy x-ray absorptiometry, or DEXA, is used to examine two areas at greatest risk, the hip and lumbar spine (low back). DEXA is a little more expensive than regular x-rays, and less expensive than CAT scans, but is more precise and you are exposed to much lower levels of radiation. The test is quick, easy, and painless, and involves a scan of the hip and lower spine.

Treatment

The mainstays of current treatment are weight restoration, normalizing body composition (particularly fat content), and use of calcium and vitamin D supplements. Estrogen supplementation (without weight gain) does not stop further bone

(OVER)

Calcium Content of Some Common Foods

Food	Serving size	Calcium (mg)
Milk, skim	1 cup	302
Yogurt, nonfat	8 oz	300
Swiss cheese	1 oz	287
Figs, dried	10 figs	269
Tofu, raw, firm	+ cup	258
"Total" Cereal (whole grain)	+ cup	250
Orange juice with calcium	8 fluid oz	300
Nutri-Grain Cereal Bars	1 bar	200
Honey Wheat Bagels	1	200
Blackstrap molasses	1 Tbsp	172
Sardines, canned in oil	2 sardines	92
Mustard greens	+ cup	52
Broccoli, boiled	+ cup	36

Tip: Read labels! Many foods are now fortified and it is easy to find high-calcium foods in most supermarkets.

Source: Adapted from The Medical Letter, vol. 42, Issue 1075, April 3, 2000, p.30.

loss or correct low bone mineral density.

Restoring weight. For young teens, body fat content should be at least 17%; adult women should aim for a body fat composition between 22% and 25%. Gaining weight helps, but may not fully restore bone mass.

Calcium intake. The average American consumes less than 800 mg of calcium per day. The National Academy of Sciences recommends 1300 mg of calcium/day for children 9 to 18, 1000 mg per day for adults 19 to 50, including pregnant and lactating women, and 1200 mg/day for everyone over 50 years of age.

Although it hasn't been proved that calcium can help restore bone in patients with anorexia nervosa, the current recommendation is that patients eat 1,500 mg per day of calcium, preferably in calcium-rich foods such as milk (see Table 1, "Calcium Content of Some Common Foods"). Also, many non-dairy foods are now fortified with calcium. If it isn't possible to get the full requirement from food alone, oral calcium supplements may be the answer. Vitamin D, 400 international units (IU)/day, is also recommended because it helps the body absorb calcium. Calcium tablets are usually easy to take and cause few symptoms. Sometimes calcium carbonate tablets may cause constipation, bloating, and excess gas. If this is the case, individuals should switch to a different brand and increase your fluid intake. People who have a tendency to form calcium stones in the urinary tract are usually advised not to take calcium supplements.

Calcium supplements come in a variety of forms. Some come from natural products such as oyster shell or bone. Others are marketed mainly as antacids (like Tums, for example). Calcium carbonate and phosphate preparations have the highest amount of elemental calcium, about 40%. Calcium citrate contains 21% elemental calcium; calcium lactate and calcium gluconate contain 13 and 9% elemental calcium, respectively. There is little evidence that one type of calcium is more effective than another in preventing osteoporotic fractures; calcium citrate may be better absorbed, however.

Moderate exercise. Moderate exercise, such as walking or yoga may be helpful—once your weight is restored. Strength training may also be useful. It is a real challenge: exercise may lessen appetite and slow continuing weight gain in a person recovering from anorexia. Also, some patients may become compulsive about exercise.

Is there any good news about osteoporosis? The good news is that increased awareness can lead to earlier diagnosis and treatment. Media campaigns promoting getting adequate calcium in the diet and the importance of moderate exercise are helping raise awareness of this devastating disease.

(Note: Dr. Pauline Powers contributed to this patient information sheet.)

Bone Disease Websites

NIH Osteoporosis and Related Bone Diseases-National Resource Center

Try <http://www.osteoporosis.org/>, the official website of the NIH-ORBD-NRC. This website gives information about many aspects of osteoporosis and offers links to other bone-disease-related websites. It also provides a "Bibliographies" page, which offers a selection of references related to subjects such as eating disorders and bone density, sodium fluoride and osteoporosis, and men and osteoporosis.

The National Osteoporosis Foundation (NOF)

The official website of the NOF is <http://www.nof.org>. This easy-to-use website is designed more for patients than clinicians, and offers advice on a wide range of topics, including maintenance of a healthy diet, patient support groups, and ways of preventing or slowing the progress of osteoporosis. This site is specially geared to health-care professionals, and offers information on many aspects of osteoporosis, including an online version of "Osteoporosis Clinical Practice Guidelines."

American Society for Bone and Mineral Research

This website, <http://www.asbmr.org/>, is the official website for the American Society for Bone and Mineral Research, and is aimed at researchers. The website lists future conferences, grants and awards, employment opportunities as well as online access to abstracts of the latest issues and back issues of the Society's journals. (Full access requires membership in the Society.)