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Causes and Management of Edema in Patients with Eating Disorders

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Edema is defined as the swelling of soft tissues as a result of excess fluid accumulation. It is a common finding in patients with both anorexia nervosa-restricting subtype (AN-R) and the AN binge-purge subtype (AN-BP) during the refeeding period. Although edema is seen in both AN subtypes, a recent study identified significantly higher rates of edema formation in patients with AN-BP compared to those with AN-R (41.7% vs. 28%, respectively; Rylander et al., 2017). Edema is highly prevalent, complex, and frustrating for ED patients, who already have much body dysmorphia and high degrees of body image distress.

Etiology and Pathogenesis

Edema can be observed in both AN-R and AN-BP, although the mechanisms differ. Edema in patients with AN-R is caused by an abnormal pattern of exuberant insulin secretion early in refeeding, and it involves insulin's known proclivity towards causing salt reabsorption in the kidney. Alternatively, excessive sodium and water retention may be related to abnormalities in sodium-potassium pumps, which occur in severe malnutrition (Rigaud et al., 2010). This type of edema is generally mild, develops early in refeeding, and is only associated with a few pounds of additional weight gain from the edema. Intermittent leg elevation for 20 to 30 minutes a few times per day is generally enough to treat this mild edema during the first week of refeeding.

A more dramatic presentation of edema formation is noted in patients with AN-BP and bulimia nervosa, who have a history of chronic excessive laxative and diuretic abuse and self-induced vomiting behaviors. This form of edema occurs upon abrupt cessation of those purging behaviors. The mechanism of edema in these patients is very distinct from that mentioned for patients with AN-R, and it is similar to that seen in patients with Bartter's syndrome. Bartter's syndrome, first described by Frederic Bartter in 1962, is a constellation of findings characterized by hypokalemia (low potassium), hypochloremia (low chloride), metabolic alkalosis (an alteration of pH in the blood), high blood pressure, and increased urinary excretion of sodium, chloride, and potassium (Bahia et al., 2012). These electrolyte disturbances are accompanied by a state of chronic dehydration, which activates the renin-angiotensin-aldosterone system. This then leads to increased secretion of aldosterone from the adrenal glands to prevent fainting from low blood pressure. Elevated aldosterone levels in turn lead to increased sodium reabsorption in the kidney to maintain blood pressure. The end result is hypokalemia, metabolic alkalosis, and edema formation due to the new salt-retaining state.

Similar metabolic and electrolyte disturbances have been observed in eating disorder patients in a state of chronic hypovolemia (dehydration) due to all purging behaviors (Brown and Mehler, 2012). This

phenomenon is termed "pseudo-Bartter," given symptoms and clinical abnormalities secondary to volume loss rather than to an inherent kidney dysfunction (renal tubular defect). Similar to Bartter's syndrome, elevated aldosterone levels are present, which results in the development of metabolic alkalosis and severe edema formation. The elevated serum aldosterone levels take approximately 1 to 3 weeks to return to normal once chronic dehydration from purging has been removed. Thus, when patients enter treatment and stop their purging behaviors, their persistently abnormally elevated aldosterone levels lead to rapid edema formation, fluid retention, and excessive weight gain, which can reach 10 to 20 lb of edema weight gain over just a few days. This can understandably be quite distressing to patients with eating disorders. If no pharmacologic intervention is undertaken, edema and weight gain have been observed to peak between 4 to 10 days after purging ends, and can last up to 2 to 4 weeks.

Evaluation and Treatment

It is important to keep in mind the need to minimize edema formation in patients with eating disorders as much as possible, as it causes significant mental distress and discomfort. When left untreated, the tendency for edema to develop upon abrupt cessation of chronic excessive purging can interfere with successful treatment (Brown, 2012).

As mentioned earlier, patients with AN-R who have edema do not typically have high aldosterone levels. As a result, the aldosterone antagonist spironolactone is generally not indicated for this population. In contrast, patients entering eating disorder treatment who have been engaging in excessive purging behaviors that are abruptly stopped often quickly develop the constellation of symptoms known as pseudo-Bartter's. During this process sodium and water continue to be avidly reabsorbed without the previously present egress of fluids due to the purging behaviors. A component of this is treating the volume depletion and low blood pressure, which drive the compensatory elevation in serum aldosterone levels. In an inpatient medical setting this can be accomplished with slow intravenous administration of saline, to turn off the stimulus for serum aldosterone. Unfortunately, this leads to an undesired further state of increased retention of salt and water. Thus, the treatment of these disturbances involves aggressively addressing the electrolyte and acid-base disturbances as well as preventing and treating the resultant edema. It is important to keep in mind the need to minimize edema formation in patients with eating disorders as much as possible, as it causes significant mental distress and discomfort. When left untreated, the tendency for edema to develop upon abrupt cessation of chronic excessive purging can interfere with successful eating disorder treatment (Brown and Mehler, 2012).

In addition to discontinuing the purging behaviors, treatment of edema in AN-BP patients who purge or use laxatives involves addressing the core hyperaldosterone response and correcting electrolyte disturbances. Similar to AN-R, a component of this is treating the volume depletion and low blood pressure that drive the compensatory elevation in serum aldosterone levels and this can be done with slow intravenous administration of saline, to turn off the stimulus for aldosterone secretion from the adrenal glands. One must take into account the avid response to saline due to elevated aldosterone levels, which can lead to an undesired further state of increased retention of salt and water. Thus, judicious administration of said fluids can help prevent a state of volume overload. A suggested approach is to administer 1 to 2 L of intravenous saline slowly over a period of 24 to 48 hr, at a rate of 25 to 50 mL/hr, with monitoring for resolution of alkalosis or for normalization of the serum bicarbonate level to <30 mEq/L (McBride et al., 2016). Once volume is corrected, the metabolic alkalosis will resolve.

In addition to considering administration of gentle intravenous fluids, use of the potassium-sparing diuretic, spironolactone, is strongly recommended. Spironolactone antagonizes the effects of aldosterone in the distal renal tubule. Thus, it can minimize edema formation secondary to excessive aldosterone levels. Further, its mild diuretic effect can help treat edema that may still occur. Effective daily dosing ranges from 25 mg to 200 mg; lower doses may be utilized initially and up-titrated as needed for increased effect if edema formation and weight gain are ongoing. Some guidelines recommend starting

with 100 mg and up-titrating to a maximum effective dose of 400 mg, with up-titration every 3 to 4 days (Runyon, 2004). In our practice, we generally do not administer doses higher than 200 mg. Alternative classes of more potent diuretics, such as thiazides and loop diuretics, should generally be avoided because they can exacerbate activation of the renin-angiotensin-aldosterone axis and worsen the metabolic alkalosis. Rarely, they are judiciously required for severe edema formation with excessive edema formation despite spironolactone. However, in this complex situation, triple therapy must be initiated by those with specialized medical expertise.

In addition to medical therapies, given the distressing nature of edema in eating-disordered patients, forewarning and reassurance regarding the transient nature of edema and therapeutic support are other important components of treatment (Ehrlich et al., 2006). Failure to recognize the importance of behavioral interventions or the distress caused by edema, as well as a lack of understanding of the physiologic changes associated with edema formation, may lead patients to avoid seeking care, given previous negative experiences with edema formation and weight gain in treatment settings.

Conclusions

Development of edema in patients with eating disorders is a complex phenomenon. When recognized early and treated appropriately, edema can be managed quite effectively, minimizing patient distress. Doing so requires an understanding of the distinct mechanisms that allow clinicians to judiciously manage therapeutic interventions. These include administration of intravenous fluids (if the person is in an inpatient medical setting) and use of the potassium-sparing diuretic spironolactone, or simply recommending leg elevation. These interventions can mitigate the significant volume overload that can occur in patients with edema secondary to volume loss in the setting of purging, or diuretic or laxative use. In addition, providing appropriate education and therapeutic support with leg elevation for those who develop edema from early treatment of AN-R can serve to further support patients in whom edema is a significant source of distress during treatment.

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About the Authors

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Update: Hospitalizations for EDs Rise Among Children in Great Britain

Recent reports from the United Kingdom show that nearly 20,000 persons a year with eating disorders are being admitted to National Health Service hospitals. Some blame the effects of social media, which continue to promote physical ideals. A sharp rise has been reported among children younger than 9 years of age and among preteens. Great Britain's Health Secretary Matt Hancock said he was "appalled" by the easy access children had to websites and forums promoting lethal lifestyles, as he pledged to take action to protect those growing up in a digital world. The new National Health Service statistics for England show a 37% rise in hospital admissions for eating disorders in just two years.

There were 19,040 admissions for eating disorders among all age groups in 2018-2019, up from 13,885 in 2016/17, according to the National Health Service. The majority of such admissions were for anorexia nervosa; of note, this included 16 cases in boys and girls aged nine and under—up from 6 cases the year before. There were 186 admissions for anorexia nervosa in girls aged 10 to 12 in 2018/19, and 27 for boys aged 10 to 12. According to *Epidemiology of Eating Disorders*, eating disorders are more prevalent in children in Great Britain than type 2 diabetes. Echoing these reports from the UK, the U.S. Agency for Healthcare Research and Quality reports hospitalization of children under 12 with eating disorders increased 119% from 1999-2000 to 2005-2006.

From Across the Desk

In this issue, frequent contributor **Dr. Philip Mehler** and co-authors **Drs. Leah M. Swanson** and **Melanie L. Hebert** of the Eating Recovery Center in Denver bring us a comprehensive article on a common and complex subject, edema in patients with eating disorders. They write that edema in patients with eating disorders is a complex phenomenon. When recognized early and treated appropriately, it can be managed quite effectively, minimizing patient distress.

Increasingly, researchers are finding that using the Internet to reach and keep contact with patients has been very worthwhile. We see this in many articles that use a social platform, such as Facebook, to reach study participants.

New Advisory Board Member

We also welcome a new member to our Editorial Advisory Board, **Judith Banker, MA, LLP, FAED**. Judith is founder and Director of the Center for Eating Disorders, Ann Arbor, MI. She is also a past President and a Fellow of the Academy for Eating Disorders. Judith currently serves as Clinical Consultant to Huron Oaks Adolescent Eating Disorder Recovery Program, a partial hospitalization program at St. Joseph Mercy Hospital, also in Ann Arbor.

Telehealth steps in

Increasingly, researchers are finding that using the Internet to reach and keep contact with patients has been very worthwhile. We see this in many articles that use a social platform, such as Facebook, to reach study participants. Our Medical Editor Dr. Scott Crow offers several sources for information using telehealth sites (see "COVID-19, Eating Disorders, and Telehealth," elsewhere in this issue).

The COVID-19 virus interrupted our publisher's annual symposium, planned for March 26-29 in Orlando, FL. The annual meeting of the International Association of Eating Disorders Professionals, always a highlight of the year, was rescheduled for next year. Kudos to Director Bonnie Harken and staffer Marie

Grover and all the other staff members for all their hard work in handling the challenges of cancelling this large meeting, keeping members and visitors safe from the virus. The staff and Board members are exploring alternative ways to bring members and other eating disorders professionals an online version of the March Symposium. The program, now in a virtual environment, "IAEDP Symposium 2020. A Vision of Hope," is coming soon. For more information, see [here](#).

—MKS

COVID-19, Eating Disorders, and Telehealth

A rapid migration to telehealth is underway.

At the moment, the COVID-19 pandemic continues to accelerate and efforts to contain it, or to "flatten the curve" to diminish infection rates and relieve overburdened medical resources, are greatly affecting the provision of ED treatment. At least two potential strategies present themselves.

First, there is now a substantial body of evidence supporting online or m-health approaches to treatment of eating disorders, particularly for patients with BN (for example, see Zerwas et al.: *Psychother Psychosom.* 2017;86(1):47-53) or BED (for example, see: Wagner et al.: *Behav Ther.* 2016 Jul;47(4):500-14). However, much of this development may still be at the research implementation stage; it is unclear how many such programs are already in current clinical usage.

Across much of mental health care, an extremely rapid migration to telehealth delivery of treatment is underway. And there is actually a small literature in this regard, with case reports for CBT-E (Abrahamsson et al.: *J Behav Ther Exp Psychiatry.* 2018 Dec; 61:104-112) and FBT (Anderson et al.: *Int J Eat Disord.* 2017 Oct; 50(10):1235-1238), and a brief review of factors to consider (Sproch and Anderson: *Psychiatr Clin North Am.* 2019 Jun; 42(2):243-252). At the same time, government payers and regulators are rapidly relaxing restrictions of tele-provision of care. Those with eating disorders continue to be in need of treatment, and telehealth seems an ideal option for many at this moment.

—SC

EDR Welcomes a New Board Member

EDR is pleased to welcome Judith Banker, MA, LLP, FAED, to our Editorial Advisory Board. Judith is founder and Executive Director of the Center for Eating Disorders, Ann Arbor, MI. She is also a past President and a Fellow of the Academy for Eating Disorders. Judith currently serves as Lead Clinical Consultant to Huron Oaks Adolescent Eating Disorder Recovery Partial Hospitalization Program, a partial hospitalization program at St. Joseph Mercy Hospital, also in Ann Arbor (website: www.stjoeshealth.org/eating-disorders). She received the 2011 AED Clinical Leadership Award. Her research and publications address a range of topics, including research-practice integration, effective eating disorder treatment, and early identification and screening for eating disorders. She is co-author (with Aimee Liu) of *Restoring Our Bodies, Reclaiming Our Lives: Guidance and Reflections on Recovery from Eating Disorders* (2011).

Distinct Differences Separate ARFID and AN Patients

ARFID patients don't fear weight gain or changes in body shape.

Though they seem to share some characteristic symptoms, patients with avoidant/restrictive food intake disorder, or ARFID, and those with AN are distinctly different. As defined in the *DSM -5*, ARFID can occur at any age and does not include fear of gaining weight or body image disturbance. Instead, ARFID patients have other motives for avoiding food, such as the characteristics of the food, fear of eating (vomiting, choking, swallowing), or a lack of interest in food. In addition, unlike its earlier definition as a Feeding disorder of Infancy or Early Childhood in the *DSM-IV*, which restricted the diagnosis of ARFID to children younger than 6 years, ARFID no longer has any age restrictions.

Dr. Isaku Kurotori and colleagues at Jichi Medical University, Tochigi, Japan, designed a chart review study to compare two groups: children and adolescent inpatients diagnosed with ARFID (n=13; 2 boys, 11 girls) or children and adolescent inpatients with restricting-type AN (AN-R, n=79; 1 boy, 78 girls). The researchers followed both groups during hospitalization and after discharge. All the subjects were 16 years of age or younger.

The researchers used *DSM-5* guidelines to help build a characteristic profile of the young ARFID patients. Most (92%) had presented with concerns about the consequences of eating, while 1 (8%) presented with sensory concerns as the most prominent clinical feature. None showed a lack of interest in eating, but all had medical conditions or life events, such as gastroenteritis, choking, or the smell of a school lunch, that might have led to them developing ARFID. The ARFID group was significantly younger than the anorexic group (10.7 yr vs. 12.7 yr, respectively). The rate of recovery was also significantly higher among the ARFID group than the AN group: (77% vs. 43%, respectively). In another study, Nakai et al. reported a recovery rate of 51.9% for ARFID patients vs. 35% for patients with AN (*Eat Behav.* 2017; 24:49).

The authors' findings suggest there were no differences in the body weights of the two groups but that the ARFID patients had better outcomes than did the AN-R patients. Dr. Kurotori and colleagues proposed that early recognition and early intervention and enough intensive care might have contributed to better outcomes for the young ARFID participants.

Problematic Physical Exercise in Anorexia Nervosa

Researchers offer a model to better define this excess exercise.

Although "abnormally high levels of physical activity" are common among those with eating disorders, especially those with anorexia nervosa, no clear definition or treatment approach has yet been established. A group of French researchers has proposed a new classification of problematic use of physical activity (PPA), in addition to a proposed model of the development of this behavior in persons with AN (*Nutrients.* 2020; 12:183).

After a thorough review of 47 articles retrieved from *Medline* and *Web Science*, the authors identified voluntary and involuntary PPA in patients with AN. (The authors noted that bulimia nervosa was not included in the review due to the lack of sufficient reports of BN and excessive activity.) Voluntary increases in activity in AN were viewed as a conscious strategy to maximize weight loss, while involuntary PPA increased proportionately with weight loss, indicating, the authors write, that "exercise might be

under the control of a subconscious biological drive and involuntary cognition." They proposed a somewhat modified model for the development of problematic physical activity that involves 5 "periods" or phases of illness that evolve into 3 distinct stages.

A model of the development of PPA in AN

The model takes into account both the history of the patient and his or her interaction with the environment and the pathological consequences of AN. The model is divided into 5 periods: Period 0, factors preceding AN; Period 1: onset of AN; Period 2, evolution of AN, Period 3, the acute phase of AN; and Period 4, long-term outcome.

Period 0. In Period 0, the main points that the authors feel should be evaluated are a patient's childhood activity profile, having a more physically active father, and participation in esthetic or weight-oriented sports. An increase in PPA is usually observed one year before AN's onset. PPA is seen as a conscious strategy for AN patients to optimize weight loss, and is also found in the general population.

Period 1. In Period 1 and Clinical phase 1, patients design a physical activity determined in defined moments of the day. The physical activity then progressively increases in volume, intensity, and/or frequency.

Period 2. In Period 2, PPA becomes a coping strategy to compensate for, to suppress, or to alleviate both negative affective states and eating disorder symptoms, including preoccupation with weight, drive for thinness, body dissatisfaction, and development of a restrictive profile.

In clinical phase 2, as the eating disorder progresses, physical activity can become increasingly autonomous, and involuntary PPA appears with automation of the behavior. Thus, patients run instead of walking, and stand when they would normally be seated. This behavior is teamed with diffuse restlessness and instability, where the patient has trouble standing still ("static PPA"). Some patients will unconsciously maintain muscular tension, such as contracting their gluteal or abdominal muscles.

Period 3. In Period 3, the problematic activity becomes compulsive and is not under voluntary cognitive control by the patient. Some patients also have voluntary PPA due to body dissatisfaction and preoccupation with weight.

In clinical phase 3, PPA is described by patients as being more intense, driven, disorganized, and aimless than before. The authors noted that in this phase they saw three overall profiles of patients: hypo- or normally active patients, patients who are able to control important PPA, and patients who can't control their extremely and increasingly solitary PPA. Animal studies have shown that a small subgroup can be hyperactive until death despite having a very low weight.

Period 4. Period 4 involves the long-term outcome. The authors note that the long-term outcome for patients with AN and problematic physical activity is still not well known. Long-term weight-recovered patients have been found to have a frequency of PPA similar to that of healthy controls. The problematic activity does seem to be associated with higher rates of dropout from treatment, and could be a negative factor for extremely active patients, according to the authors.

The authors feel that the evaluation of the intensity, frequency, duration, and type of physical activity, with the motives for exercise, compulsiveness, and dependence on exercise, could lead to more individualized and efficient therapies for these patients.

Impulsivity Is Associated with Eating Disorders Risk

A large study in France shows a pathway for risk among the general population.

Impulsivity is a personality trait defined as a predisposition toward rapid unplanned reactions to internal or external stimuli without regard to the negative consequences of these reactions. There is thought to be a link between impulsivity and ED (both research and clinical experience bear this out). Despite this, few studies have examined the relationship between impulsivity, dietary intake, and eating disorders among a general population.

Impulsivity and risk

In a large study of members of the general public in France, researchers explored the ways in which impulsivity is associated with dietary intake, snacking, and the risk of eating disorders (*Am J Clin Nutr.* 2019; 109:117). The study was conducted as part of the NutriNet-Santé Study, a large ongoing Internet-based prospective cohort study launched in France in May 2009, which included 51,368 adult participants. Impulsivity was measured using the Barratt Impulsivity Scale, or BIS, and ED risk was assessed using the EXPALI algorithm described earlier ("Improving Detection of Eating Disorders with a New Algorithm," elsewhere in this issue).

The researchers reported that impulsivity was associated with lower diet quality, higher alcohol intake, and with risk of developing an eating disorder.

Correction

Erin Knopf, MD, co-author of "Managing Low Bone Mineral Density in Adolescents with Eating Disorders: A Review of Pathophysiology, Diagnostic Modalities and Treatment," in the July-August 2019 issue, is a board-certified pediatrician and psychiatrist at the Eating Recovery Center, Denver, CO. She is a member of iaedp, AED, AACAP, APA, and AAP.

Orthorexia Nervosa: A Condition in Search of a Diagnosis?

One study shows distinct similarities and differences between ON and symptoms of an eating disorder.

On the surface, orthorexia nervosa, or ON, might seem like an admirable attempt to eat only "healthy foods." Eating healthily fits right into our national trend to favor natural foods. Steven Bratman, MD, MPH, a California physician, coined the term orthorexia nervosa ("fixation on righteous eating") in 1996. Diagnostic criteria have been proposed, but the relationship of ON to (other) eating disorders is still not clear.

Some experts think there are similarities between the constant worry about food seen in orthorexia as in eating disorders such as BN and AN because all share common efforts around food and control. There is still controversy about this pattern of eating, and some suggest ON shares characteristics with obsessive-compulsive disorders, somatoform disorders, and even autism spectrum disorders. However, ON does not neatly fit into any diagnostic criteria.

Segura-Garcia et al. showed that 28% of patients with AN and BN showed a tendency to ON using

Bratman's measure, the ORTO-15 (*Eat Weight Disord.* 2015; 20:161). This increased to 53% of patients by the end of the study. That study's findings suggest that ON symptoms may recede, develop, or even coexist with an eating disorder.

Some overlapping symptoms

Marta Plichta and Marzena Jezewska-Zychowicz of Warsaw University of Life Sciences, Warsaw, Poland, designed a study to better define ON, and to compare it with symptoms of eating disorders in a sample from the general population (*Nutrients.* 2020; 12:218). The final sample included 1120 male and female students 18 to 35 years of age recruited from 7 universities. The researchers gathered information about eating habits and eating disorder symptoms, as well as sociodemographic characteristics, using the Polish version of the *Eating Disorder Screen for Primary Care Professionals*. Orthorexia symptoms were assessed using the ORTO-15. The final study group included 70% females and 30% males. More than 70% of participants were under 23 years of age, more than two-fifths lived in large cities, and about 73% were of normal weight.

A tendency toward ON was found in 28% of the study sample, while low-level eating disorder symptoms were found in nearly 51%. More than a third of the students had only eating disorder symptoms, while 15% showed only a tendency to have ON. Nearly two-thirds reported that they ate 4 or more meals a day, while more than half (59%) did not eat meals regularly. Eating habits were not related to gender. Nearly 70% of the participants ate meals every 3 to 4 hr; more females ate every 3 to 4 hr, compared to males, who took a 4-hr break between meals. Most (87%) students did not skip breakfast, dinner (92.3%), or supper (87.9%). Thirteen percent of the students were on special diets.

Using the results of the *ORTO-15* questionnaire and a cut-off age of 35 years, ON was identified in 28% of the study sample, consistent with earlier studies. Almost half of people with a tendency to ON also showed symptoms of an eating disorder. The authors noted that although ON may precede an ED, it may also occur during remission from an eating disorder.

The authors also pointed out that a high proportion of participants—38%—showed only eating disorder symptoms. This was higher than that found in other studies among students from 9 other countries, where the incidence of eating disorder symptoms ranged from a low of 2% to a high of 29%. Some researchers have noted that starting a new educational program, such as going to college, may increase stress, social pressure, and low self-esteem and can lead to a change in eating behaviors, particularly those behaviors designed to avoid weight gain.

Some differences emerged.

Students who showed only eating disorder symptoms were characterized by unhealthy eating behaviors, such as eating fewer than the recommended number of meals daily, eating irregularly, and having a break of more than 4 hr between meals; also, they frequently skipped dinner. In contrast, people with ON ate 4 or more meals a day, at regular intervals, and had a 3- to 4-hr break between meals. They did not skip meals later in the day. They also ate less sugar-rich foods and refined products, and their diets contained less sugar and salt than in people who had disordered eating patterns.

The authors noted that although finding that the coexistence of a tendency toward ON and eating disorders symptoms showed no relationship with eating habits provides new information, more research is needed. Such studies, using more sensitive and validated tools, will help identify both a tendency to ON and eating disorder symptoms.

Prenatal Complications and Risk of a Future Eating Disorder

Two studies trace genetic and environmental factors.

Do complications during pregnancy and birth increase the risk that a child will go on to develop an eating disorder? Yes, say Danish, Swedish, and American researchers, who studied more than a million individuals born in Denmark from 1989 to 2010 to Danish-born parents (*Psychol Med.* 2020; Jan 8; published online ahead of print). The children were followed from their sixth birthday through the end of 2016. Registry data were used to gather information about EDs, anxiety, mood, or OCD diagnosis, as well as factors related to pregnancy, birth, and perinatal conditions.

Early exposure may influence a child's mental health

Janne Tidselbak Larsen of Aarhus University, Aarhus, Denmark, noted that results of this large study suggest that older maternal age may increase risk of developing an eating disorder, particularly AN, later in life. Prematurity also increases risk for ED as well as other psychiatric disorders.

A study of prenatal and perinatal risk factors

A second study, conducted by Dr. Hunnah Watson and researchers at the University of North Carolina, Chapel Hill (*Int J Eat Disord.* 2019; 52:643) investigated whether prenatal/perinatal complications are associated with lifetime disorders in women and also includes, for the first time, information on the relationship of prenatal and perinatal factors to binge-eating disorder (BED) and purging disorder (PD) risk. The "fetal programming model hypothesis" that developmental programming in utero and in early life helps to explain adult outcomes, in this case disordered eating.

Two generations, mothers and their mothers, were the focus of the study. Participants included 46,373 adult women enrolled in the well-known Norwegian Mother and Child Cohort Study (MoBa). Mothers with a history of lifetime eating disorders were compared to a referent group.

Results of this study suggest that fetal programming may be relevant to the development of AN and BED. 850 Main Campus Drive who weighed more at birth or who were born large for gestational age were more likely to develop BED in later life. Mothers who weighed less at birth were more likely to develop AN.

Genetic or environmental effects?

According to the authors, more research is needed to help untangle whether these associations are a function of genetic influences or a true environmental fetal programming effect.

Improving Detection of Eating Disorders with a New Algorithm

An instrument designed to help primary care physicians make the diagnosis earlier.

The potential seriousness of eating disorders such as bulimia nervosa and anorexia nervosa makes early detection and treatment essential, but case finding still seems poor. Fewer than 10% of cases of BN and binge-eating disorder (BED) are detected by general physicians. For example, a lack of understanding of BED as a distinct eating disorder may lead to low rates of screening and diagnosis of the most-frequent eating disorder, according to researchers in France. In addition, the authors stress that patients with eating disorders often present with emotional difficulties and often denial, which may keep them from

seeking treatment.

Dr. Marie-Pierre Tavoracci and fellow psychiatrists at Rouen University Hospital recently evaluated the performance of a clinical algorithm, Expali,TM used among patients referred for treatment of eating disorders, to the adult nutrition department at Rouen University Hospital during November and December 2015. This simple tool is an algorithm combining body mass index (BMI) and individual answers to the SCOFF test (*BMC Psychiatry*. 2019; 19:366). The authors argue that it could be very helpful for supporting a diagnosis of an eating disorder during screening in a primary care setting.

The algorithm was developed from 104 response patterns based on BMI grouping and answers to 5 SCOFF questions. Patients in the study were classified into four categories based on BMI (underweight, normal, overweight, and obese). A positive result on the SCOFF (Sick, Control, One stone [losing 1 stone, or 14 lb, in the last 3 months], Fat, Food) requires two positive answers to such questions as, "Do you worry that you have lost control over how much you eat"? The authors piloted the measure in 206 people with EDs.

In this SCOFF-positive eating disorders population, the algorithm correctly classified 3 of the 4 broad categories of eating disorders (restrictive, bulimic, hyperphagic, and other unspecified eating disorder) with good sensitivity. The sensitivity ranged from 70% to 80%, except for the final group, where the sensitivity was 16.7%. The authors feel the algorithm could help healthcare professionals and general practitioners detect EDs earlier, improving patient outcome.

QUESTIONS AND ANSWERS: Taste Perception in Eating Disorders

Q. I was reading somewhere that foods may taste differently to people with eating disorders than to those without eating disorders. Is there any truth to this?

A. There is some evidence of this. A group of researchers at the Division of Intramural Research at the National Institutes of Health, the School of Nursing, and the Center for Weight and Eating Disorders at the University of Pennsylvania, Philadelphia, recently used a systematic review to find studies that might answer this question.

The group, led by Dr. Ariana M. Chao, used a systematic literature review that initially included 2820 studies and 364 full-text articles, but only yielded 49 relevant studies in the end. Most studies included only female participants, and the mean age of participants ranged from 15 to 42 years of age. The researchers included studies of patients with AN, BN, and BED (*Biolog Res Nrs*. 2020; 22:82). And these studies ranged from self-report to direct taste measurement to neuroimaging methods.

The researchers did find some interesting characteristics among all the participants. Generally, individuals with BN had a greater preference for sweetness than those with AN. Patients diagnosed with AN had a greater aversion to fat.

When the authors evaluated the results of neuroimaging studies, they found that activation of taste-reward regions of the brain (for example, the insula, ventral, and dorsal striatum) to sweet-taste stimuli was lower in those with AN and higher in those with BN and BED.

The authors note that results were somewhat variable and this may relate to varied study designs. Some studies had no controls, and study sizes varied widely.

In the Next Issue

Meeting Highlights from the International Association of Eating Disorders Professionals Webinar series

When Covirus-19 reached the United States, most professional meetings and events were suspended, postponed, or cancelled. IAEDP's Board and staff wisely cancelled their March 26-29 meeting in Orlando, FL, but took the symposium to the Internet so that members could "attend" the sessions.

PLUS

- **Recognizing Restrictive Eating Disorders in Formerly Overweight Teens and Young Adults.**

Noting the differences in presentation between these patients and those with classic AN can help speed recognition and lead to appropriate treatment.

- **Eating Disorders During 'Emerging Adulthood.'**

During the transition to adulthood, the treatment needs of young adults may go unaddressed. Some adaptations may make treatment more successful for these patients.

- **Extreme Risk-Taking Behaviors.**

This case series explored 4 female patients who did not comply with treatment and were indifferent to their grave medical conditions. The authors also demonstrated how pregnancy can pose a high risk among some women with eating disorders.

- **A New Treatment Approach: Combining Physical Activity and Dietary Therapy.**

Norwegian clinicians suggest a program that improves treatment and reduces treatment drop-outs for patients with BN and BED.

And much more...

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