The Dangers and Discomforts of Eating Disorder Treatment:

Refeeding Syndrome, Pseudo Bartter Syndrome, and More

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Educational Objectives

At the conclusion of this activity, learners will be able to:

1. Describe the basic causes and symptoms of refeeding syndrome and pseudo Bartter syndrome.

2. Describe the basic treatments and prevention strategies for refeeding syndrome and pseudo Bartter syndrome.

3. Identify pain symptoms related to weight restoration.

4. Identify risk factors and findings that necessitate a higher level of care.

DANGERS and DISCOMFORTS

- Weight restoration risks
  - Refeeding syndrome
  - Pseudo Bartter syndrome
  - Pain (many types)
- How it relates to your practice
  - Therapist
  - Dietitian
  - PCP
  - Other Healthcare Providers

Case Study 1: Angela

- 38 year old female, 20 yr history anorexia nervosa
- Multiple inpt stays, none x 5 yrs
- Worsening pattern of restriction x 6 months
- Running 2 hrs/day x 3 months, stopped 2 weeks ago (dizziness and fatigue).
- Family members are encouraging treatment.
- Now seeing outpatient therapist, somewhat motivated to change.
- Presents to dietitian (who she's been avoiding) for weight restoration.

Case Study 1: Angela

Subjective Information

- Body aches
- Headaches
- Fatigue
- Dizziness
- Passed out at work 2x in last week
- Abdominal pain after small meals.

Objective Information

- Baseline 5'7", weight 135 lbs (BMI 21.1)
- Now weight 93 lbs (42 lb weight loss in last 6 months, 20 lbs in last 3 months)
- BMI 14.6, lowest since high school

Case Study 1: Angela

- Patient adamantly refuses inpatient treatment.
- RD and Therapist both working to get patient admitted to inpatient care anyway.
- Dietitian has contacted PCP, soonest appointment 2 weeks away.
- Despite cautions from dietitian, Angela intends to start high calorie, low volume meal plan (history severe gastroparesis).

Angela's labs (at urgent care)

- Metabolic panel within normal, including:
  - Sodium, Potassium
  - Kidney function (BUN, creatinine)
  - Liver function (ALT, AST)
- Complete Blood Count
  - Mild anemia
  - WBC count a little low
- Urine showed ketones
- Normal Magnesium and Phosphorus

4 days later, Angela returns with family member to see dietitian and reports…

- 7 lb weight gain
- Worsening dizziness
- Burning in feet
- Worsening headache
- Some mental fogginess
- Worse abdominal pain

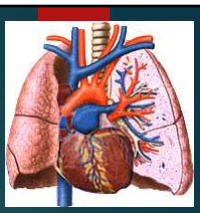
Angela Back to Urgent Care

- Potassium low end normal
- Low Phosphorus
- Low Magnesium
- Pitting edema
- Relative tachycardia (HR in 90s compared to usual high 50s)
- At UC, worsening respiratory distress

Refeeding Syndrome

- Potentially fatal shift of electrolytes and fluid
- Glucose increase → insulin increase → low phosphorus/potassium/glucose
- Low magnesium (not as well understood)
- Low potassium/mag →cardiac arrhythmias

Refeeding Syndrome



- Low phosphorus → weak diaphragm (respiratory failure)
- Low phosphorus → low ATP → impaired cardiac contractility → congestive heart failure.
- Increased insulin → sodium/water retention (edema)
- Cardiac atrophy, decreased cardiac output, now with increased blood volume

Refeeding Syndrome

- For Patient:
  - Tachycardia (mild), dizziness, low BPs, edema, arrhythmias, cardiac failure
  - Shortness of breath, respiratory failure
  - Numbness, tremors, weakness, delirium
  - Fatigue, muscle cramps, hypothermia,
  - Bloating, constipation, other GI sx
  - DEATH

Remember:
- Low Phos
- Low Mag
- Low K+

NICE Categories for Refeeding Syndrome Risk (Adapted for CFC)

- Pt has one or more of the following:
  - BMI < 16
  - Wt loss > 15% in last 3–6 months
  - No food x 7-10 days
  - Low potassium, phosphate, or magnesium
- Or pt with two or more of the following:
  - BMI < 18.5
  - Wt loss > 10% within last 3–6 months
  - little or no nutritional intake > 5 days
  - Hx regular alcohol or meds such as insulin, chemotherapy, antacids, or diuretics.

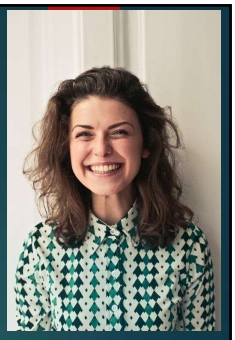
Prevention & Assessment

- Monitor labs!
  - Usually no signs and symptoms x 3-5 days
  - CMP, magnesium, phosphorus
  - Higher risk = more frequent lab checks
- Monitor edema, vital signs, weight changes
- Frequent checks with providers
- Dietary interventions
  - Avoid high carbohydrate meals
  - "Start low, go slow"

Angela

- Sent to ER and then admitted to medical hospital.
- Diagnosed with refeeding syndrome.
- Respiratory support
- Phos and mag supplements
- 10 days later, transferred to eating disorder treatment center

Case Study 2: Kayla



- 25 year old female, history of reflux.
- Presents for treatment of eczema (worse x 1 month)
- GERD worse x 2 weeks
- Not taking her antacids "I forget"
- Normal exam, BMI 22 (18.5-24.9)
- Started on a Proton Pump Inhibitor and topical steroid

Case Study 2: Kayla

- Follow up
  - GERD a little better
  - No improvement eczema
  - Now some throat pain, strep exposure
- Exam: perimolysis, chapped lips

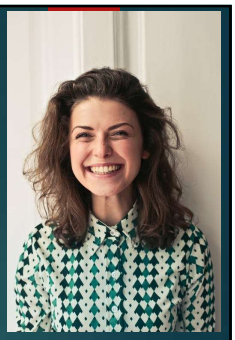
Delgado, A. J. & Olafsson, V. G. (2019). Erosive Tooth Wear: Etiology, diagnosis, risk factors, and management. *The Journal of Multidisciplinary Care Decisions in Dentistry, 5.(7), 40-46.* https://decisionsindentistry.com/digital-edition/2019/july-august.html

SCOFF QUESTIONS

- Do you make yourself **Sick** because you feel uncomfortably full?
- Do you worry that you have lost **Control** over how much you eat?
- Have you recently lost **Over** 14 lb in a 3-month period?
- Do you believe yourself to be **Fat** when others say you are too thin?
- Would you say that **Food** dominates your life?

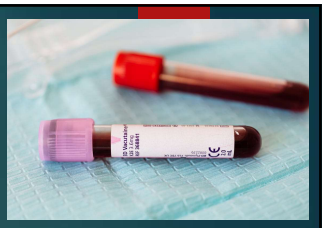
Morgan J. F., Reid F., & Lacey H. (2000). The SCOFF questionnaire: a new screening tool for eating disorders. *West J Med,* 172(3): 164-165.

Case Study 2: Kayla



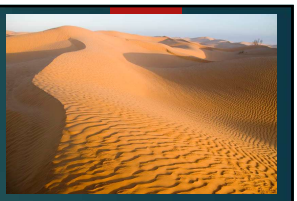
- Denies all behaviors
- PCP refers to therapy and dietary
- No show
- A few days later to E.R.: palpitations, malaise, dehydrated.
- Given rapid IV fluids, electrolytes stabilized, then discharged.
- Presents next day: edema, heartburn

Kayla's ER Report



- Low potassium
- High BUN and Creatinine (kidney function markers)
- High CO2 (Bicarbonate), alkalosis
- Low BP, high HR: corrected
- Labs also suggest dehydration

Pseudo Bartter Syndrome



- Dehydration from vomiting (also diuretic abuse)
- Body compensates with hyperaldosteronism → retain salt/water/bicarb
- Potassium loss in urine (diuretics will further worsen)
- Body trying to keep BP up, avoid fainting
- Acid lost with vomiting
- Salt lost with purging → hyperaldosteronism to retain salt
- Metabolic alkalosis

Pseudo Bartter Syndrome

- Stop behaviors (or rapid fluids given), hyperaldosteronism continues (~ 3 wks)
- Edema/Volume Overload
- Worse body image, worse behaviors
- Increased cardiac workload
- Respiratory concerns
- Uncorrected hypokalemia can lead to fatal cardiac arrhythmias.

Other Considerations With Purging

- Bicarb lost with diarrhea (so possible acidosis if purging via laxatives, still usually alkalosis)
- Potassium also lost with diarrhea
- Possible magnesium decrease along potassium decrease
- Possibly normal labs (timing)
- Check EKG! Changes with low potassium

Case Study 2: Kayla

- Eventually reports:
  - 10yr hx purging
  - Worse x 3 months (purging all meals).
  - If eats with others, waits until home, then uses stimulant laxatives.
- Laxatives and diuretics last night, extensive purging (with blood)

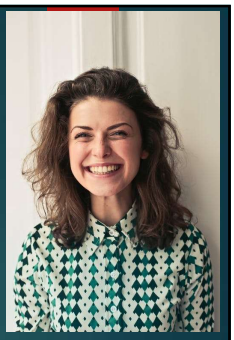
Pseudo Bartter Treatment

- Slower fluid resuscitation
- Saline if IV fluids (need the salt)
- Correct potassium levels (usually oral supplement)
- Possibly low dose spironolactone (potassium sparing diuretic) for edema and hypokalemia
- Lung and edema checks
- Correct sodium if needed

Pseudo Bartter Syndrome

- Key Takeaways
  - Hyperaldosteronism to compensate for dehydration
  - Edema
  - Hypokalemia
  - Metabolic alkalosis (high CO2)
  - Many possible unpleasant effects including death

Case Study 2: Kayla



- Admitted to inpatient E.D. treatment facility, eventually stepped down to residential care (and later partial day programming)
- High CO2, edema (pseudo Bartter's)
  - Spironolactone daily x 2 weeks
  - Dietary interventions
- Monitored CMP, mag, phos (watching for refeeding syndrome)
- Aggressive therapeutic interventions
- GI follow up: esophageal varices, watched long term
- Reflux improved, eventually stop PPI

Other Discomforts

- General (chills, night sweats, sleep disturbances)
- Headaches
- Chest Pain
- Abdominal Pain
- Muscle Pain (muscle soreness, jaw pain, etc.)
- Nerve Pain
- Emotional and Spiritual Pain
- Sometimes increased awareness of body: now noticing pain

Headaches

Pre-Treatment Causes

- Dehydration (restricting, laxatives, diuretics, vomiting)
- Migraine
- TMJ
- Anxiety (chronic neck pain and headaches)
- Low Glucose
- Concussions
- (Shrinkage of the brain)

Causes During Treatment

- Caffeine withdrawal
- Metabolic changes
- Tension headaches
- Medication changes
- TMJ (possibly worse)
- Concussions (before CV stability)
- Migraine (eventually improve)
- Refeeding Syndrome
- Anxiety

Chest Pain

Causes During Treatment

Pre-treatment Causes

- Atrophy of heart muscle
- Heart failure
- Mitral Valve Prolapse
- Arrhythmias
- Costochondritis
- Pericardial Effusions (wasting of left ventricle; possible inflammation; possible hypothyroid)
- Anxiety
- Heartburn
- Esophagitis, Esophageal Ulcers, Esophageal verices and Mallory-Weiss tears

- Weight Restoration
- Heart failure
- Mitral Valve Prolapse
- Arrhythmias
- Costochondritis
- Pericardial Effusions
- Anxiety
- Heartburn (possibly worse before better)
- Esophagitis, Esophageal Ulcers, Esophageal verices and Mallory-Weiss tears

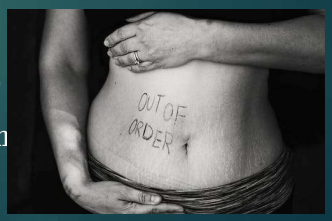
Abdominal Pain

Pre-treatment Causes

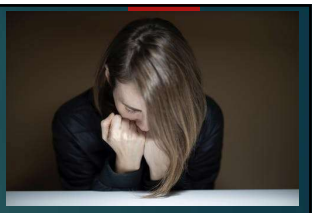
- Gastroparesis
- Constipation
- Pancreatitis
- Choleycystitis
- IBS
- Gastritis
- Chronic diarrhea (laxatives)
- Food Intolerances
- SMA (superior mesenteric artery syndrome)
- UTIs
- Ischemic bowel (stimulant laxative abuse)

Causes During Treatment

- Gastroparesis (worse)
- Constipation (worse)
- Pancreatitis (worse)
- IBS (worse)
- Gastritis
- Food Intolerances
- SMA (life threaten
- Gas Pain



Prevent Dangerous Complications of E.D. Treatment



- Team members aware and watching for complications
- Communication between interdisciplinary treatment team members (!!!)
- Appropriate labs and assessments
- Patient and family education
- Involve specialists when appropriate: GI, Cardiology, GYN, Neurology, Endocrinology, Nephrology, etc.

Indications for a Higher Level of Care

- Cardiac Complications
  - Bradycardia
  - QTc>450
  - Other concerning EKG factors
  - Arrhythmias
  - Hypotension
- Labs
  - Low Potassium
  - Low Sodium
  - Low Phosphorus or Magnesium
  - Metabolic acidosis/alkalosis
  - Hypoglycemia

Indications for a Higher Level of Care

- Failure to weight restore at current level of care
- Rapid weight loss
- Risk for refeeding syndrome
- Worsening behaviors
- Low BMI
- Medical complications

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