Effects of Disordered Eating on Health

Outline

Think organ systems

Metabolic changes

Refeeding syndrome

Compensatory strategies

Starvation or Semi-starvation

Loss of lean mass

Decrease in metabolic rate

Loss of bone mineral density

High risk for nutrient deficiencies:

iron, zinc, vitamin E & D

Glycogen depletion

Dehydration

Cardiovascular Changes

Functional & structural abnormalities even for illnesses of short duration

Appear to be reversible w/ early ID and treatment

Bradycardia

Orthostatic hypotension aka: postural orthostatic tachycardia syndrome (POTS)

Systolic 70-90 mm Hg common

Orthostatic heart rate

Decreased heart size, chamber size & wall thickness

Results in reduced cardiac output

Low voltage

Mitral valve prolapse

Congestive heart failure

Electrolytes

Hypokalemia = < 3.5 mmol/kg

Bradycardia

Cardiac arrhythmia

Cardiac arrest

Chronic hypokalemia -> renal failure

Hyponatremia = <135 mmol/kg

Cramping, spasms, dizziness, light-headed, seizures, coma

Linear Growth

Impaired linear growth

More bone growth retardation if pre-menarcheal

Complete vs. incomplete catch-up growth

D/t:

Low thyroxine (T4)

Low triiodothyronine (T3)

High cortisol

Low sex hormones

Changes in GH-IGF axis which impacts longitudinal bone growth

Metabolic Rate

BMR typically 60-70% total E expenditure

E restriction causes decreased BMR

Decline BMR mainly due to loss in lean tissue and down regulation of non-essential systems

Decrease in TEF

Alterations in thyroid activity

Endocrine Abnormalities

Thyroid-pituitary axis responds to starvation by decreasing production of thyroid hormone (mimics hypothyroid Dz)

Slowed metabolism

Fatigue

Cold intolerance

Dry skin

Bradycardia

Constipation

Lethargy

Depression

MDs must be careful not to mis-Dx hypothyroidism and prescribe thyroid hormone

Food & Mood

Dietary protein & fat trigger release of CCK

Provides feeling of fullness/satiety

Dietary protein impacts dopamine

Neurotransmitter causing feeling of alertness

Fat influences production of endorphins

Body’s natural pain killer

CHO, esp. simple sugars, stimulates serotonin

Neurotransmitter inducing calmness & sleepiness

Reproductive Dysfunction

Variety of dysfunctions

Amenorrhea

Primary or secondary

Luteal phase elongation

Due to progesterone deficiency

Anovulation

Abnormal menstrual cycles

Oligomenorrhea (> 35 d)

Very short cycles (< 21 d)

Also due to progesterone deficiency

Sperm & semen

GI Complications

Gastric motility is slowed

Abdominal bloating and fullness

Abdominal pain and constipation

Intestinal mucosa thins out & decreases enzyme production

Tears and inflammation of GI tract

Thinning of mucosa ↑ risk of ulcers

Exacerbated with:

Anti-inflammatories

excessive gum chewing

excessive coffee

Refeeding Syndrome

Severe shifts in fluid and electrolyte levels from extracellular to intracellular spaces

More recent definition: electrolyte and fluid abnormalities, altered glucose metabolism, vitamin and mineral deficiencies, and associated complications involving the cardiovascular, pulmonary, neuromuscular, and hematologic systems that can occur when a patient who has lost weight is refed orally, enterally, or parenterally

Phosphorous

Potassium

Magnesium

Refeeding Syndrome, cont.

Causes:

During starvation kidneys keep serum lytes stable

Refeeding stops the compensation

Glucose halts gluconeogenesis & increases insulin

P04, K+ & Mg follow glucose

May cause low thiamin

Na+ & water retention

Usually occurs in those @ < 70% IBW

More severe = higher risk of RS

Refeeding Syndrome, cont.

May result in:

Cardiac, neuromuscular, hematological & respiratory dysfx.

Congestive heart failure

Arrhythmias

Delirium, seizures, coma

Muscle weakness

Immune dysfunction

Death

Prevention requires slow initial refeeding

Start at REE (or below) plus 200-250 kcals q 2-3 d

Goal: 2-3 lbs/wk

Oral P04

Closely monitor lytes and P04

Christina

28 y.o. white female, 66”, 60 lbs

h/o significant wt loss prior to college graduation.

Now preparing to graduate from nursing school. Extreme emaciation.

Refeeding syndrome

Very slow to gain weight despite building up to 4000 kcals/d in 6 weeks

Stacey

42 y.o. white female, 82 lbs, 64“

h/o AN for 20 years. Husband’s daughter just had a baby girl. They now live with patient and husband.

Registered dietitian

C/o extreme dizziness & POTS upon standing

Lab values: low Glu, Mg, Ca, P04, Cl-

Normal: Na+, K+, Cr, Alb

Vomiting

Largely ineffective for body fat loss

Dehydration & electrolyte imbalance

Esophagitis and esophagus tears

Esophageal & stomach ulcers

Erosion of tooth enamel/risk of caries

Finger calluses and abrasions

Metabolic alkalosis

Ipecac Syrup

Myocarditis

Cardiomyopathy

Diuretics

Dehydration

Weight re-gained when stopped

Electrolyte imbalance (K+, Na-)

Cardiac arrhythmia

Hard to thermo-regulate

Laxatives

Wt loss primarily water & food residue

Dehydration & electrolyte imbalance

Cardiac arrhythmia

Damage to lining of intestines

Dependence

Metabolic acidosis

Excessive Exercise

Risk of:

Staleness, chronic fatigue

Illnesses: depressed immune system

Overuse injuries

Menstrual dysfunction

Diet Pills

Rapid heart rate, arrhythmia

Anxiety, nervousness

Insomnia or disrupted sleep

Dehydration

Appetite suppression only temporary- wt re-gain is likely

Addictive

Saunas

Dehydration; wt quickly regained

Electrolyte imbalances

Impaired thermo-regulation

Risk of cardiac arrhythmia

Jillian

24 y.o. white female, 65”, 120 lbs

Bulimic, h/o ETOH addiction 6 mos prior

Works 3 jobs: lab tech, dog walker & night vet ER supervisor. Aerobic exercise 60 min daily

Expensive lifestyle: new car, large apartment in Marin

“No time to eat during the day”.

Stop at 6 different fast food restaurants after work, 11 pm. Binge/purge until 3 am. Up at 7am.

Wants to “normalize eating”