

# Anorexia Nervosa in Female Adolescents: A Look at the Big Picture

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# Nature of Review

- Retrospective (case control) chart review
- Review limited to LMR resources
- 25 adolescent females with anorexia nervosa
- Subset of adolescent medicine patients with anorexia

# Limitations

- Patients referred to a tertiary level practice
- Primarily my own patients
- Patients did not necessarily have every test
- Patients did not necessarily give accurate history
- Follow up varied from six months to 6.5 years

# Description of Patients

- Anorexia began between ages 12-20 years
- Mean age for start of Anorexia 15.44 years
- Average length of time between onset of illness and being seen in clinic = 1.84 years
- Range from a few months to four years

# Physical Characteristics

- Average height 65.0 inches
- Range of % ideal weight on first consultation: 71%-98.4%
- Mean % ideal weight on first consultation:  
78.76%

# Demographics

- Age range first consulted: 13-21 years
- Mean age first consulted: 17.2 years
- 100% Caucasian
- 2 International patients

# Are There any Predictors of Patient Complications/Outcomes

- Medical Complications
- Psychiatric Co-Morbidities
- Levels of Care
- Laboratory Data
- Weight Restoration
- Current Status

# Medical Complications

- Hypokalemia x 4 patients
- Primary amenorrhea x 2 patients
- Bone Loss (osteopenia/osteoporosis) 9/23
- Nerve palsy
- Stress fracture x 2

# Psychiatric Co-Morbidities

- Bulimia x 3 patients
- Depression x 7
- Binge and Purge x 6
- PTSD x 2
- Substance Abuse x 3
- Dissociative Disorder NOS
- OCD x 3

# Psychiatric Co-Morbidities

- Stealing
- Promiscuity
- Trichotillomania
- Borderline personality
- Self-mutilation x 2
- Anxiety Disorder x 3
- ADD

# Highest Levels of Care

- Residential 18/25
- Medical Admission 3/25
- Partial 1/25
- IOP 1/25
- Outpatient only 2/25

In addition 2/25 spent an academic year at Germaine Lawrence Residential School program for girls with eating disorders

# Laboratory Data

- CBC
- Sedimentation Rate
- TSH
- Transaminases
- HCG
- Celiac Screen
- DEXA

# CBC

- 11/25 Normal red count
- 14/25 <20% reduction in Hct/Hgb ~ 50% resolved
- 23/25 Normal white count
- 2/25 Leukopenia: 50% resolved
- 22/25 Normal platelets
- 3/25 Thrombocytopenia: all resolved

# Sedimentation Rate

- 18 patients had sedimentation rates performed
- 2/18 minimal elevation
- 1/18 significant elevation case #21
- 15/18 normal

# TSH

- 24/25 normal
- Case #21 suppressed with normal T4; normalized in 4 months

# Transaminases

- 12/25 normal transaminases
- 9/25 <50% elevation in AST, ALT or both which resolved
- 2/25 50-100% elevation in AST, ALT or both which resolved
- 1/25 100% elevation in AST and ALT which resolved
- 1/25 250% elevation in AST, 350% elevation in ALT which resolved (hx of Crohn's and + ANA)

# HCG

- 25 patients had HCG testing
- 25/25 negative

# Celiac Screen

- 14/14 negative

# DEXA

- 23/25 had at least one DEXA
- 13/23 had a normal DEXA
- 7/23 had osteopenia of at least one area
- 3/23 had osteoporosis of at least one area

# Osteoporosis

- Patient #5: osteoporosis of spine; amenorrhea x 28 months; lost to follow up
- Patient # 21: osteoporosis of spine and hip; primary amenorrhea; age 20
- Patient #22: osteoporosis of spine; amenorrhea > 48 months; AN evolved into female athlete triad

# DEXA Results and Length of Amenorrhea

	<12 months	12-24 months	24-36 months	>36 months
Normal	5 1/5 on OCP	2	2	4 1/4 primary amenorrhea
Osteopenia	1	3	1	2
Osteoporosis	0	0	1	2 1/2 primary amenorrhea

# DEXA Results and 603 Estrogen Treatment of Two Patients

- #5 amenorrhea >36 months: osteoporosis
- #20 amenorrhea>36 months: osteopenia

Spine z score:

baseline: -0.8 6 m -1.1 12 m -1.035 18 m -1

Post study: -1.80, -2.10 April 2011

Hip z score

Baseline: 0.12, 6 m 0.13, 12 m -0.04, 18 m -0.26

Post study: -1.50 April 2011

# % ideal weight on last weigh-in for each patient

<80%	0
80-90%	11
91-100%	9
101-110%	1
>110%	4

# % Ideal Weight at Last Visit in LMR

- <85%                      4/25                      16%
- 85-95%                    10/25                    40%
- 95-105%                  6/25                    24%
- 105-120%                5/25                    20%

# 80-90% Ideal Weight-11 Patients

- Two have primary amenorrhea and two have prolonged secondary amenorrhea
- Six have a psychiatric co-morbidity or have transitioned to binge and purge
- One has no known co-morbidities but is in the first 1 ½ years of restriction (and slowly improving)

# >110% Ideal Body Weight

- Patient #3: depression, osteopenia; pre-anorexia weight = 36%; now 70%
- Patient #17: OCD, depression, self-harm, receiving electroconvulsive Rx; pre-anorexia weight = 29%; now 84%
- Patient #18: Substance abuse, bulimia, self-harm; pre-anorexia weight = 80%; now 95%
- Patient #19: pre-anorexia weight = 90%; now 75%

# Evolution of Illness

- 11/25 continue to restrict to some degree
- 3/25 evolved into bulimia
- 3/25 struggle with major depression
- 2/25 evolved into female athlete triad
- 6/25 have no apparent continuing issues
- Some of the patients have developed comorbidities e.g. substance abuse and OCD as well as shoplifting, promiscuous behaviors; 1/25 has a criminal issue

# Characteristics of 6 Patients without Continuing Issues-“cures”

- 5/6 no psychiatric co-morbidities
- 2/2 international patients
- 5/6 intense parental involvement in care
- 6/6 sought MGH services <1 year after commencement of illness
- Last % ideal weight range 93.4% - 114% with mean of 101.0%
- 5/6 seen in one of the bone studies

# Current Status (if known)

- High School student 5
- College student 9
- Medical school 1
- Residential care 2
- Between jobs 2
- Unknown 6

# Concluding Remarks

- Caucasian adolescent females were seen a mean of 1  $\frac{3}{4}$  years after start of Anorexia
- Average height close to US mean
- The most common persisting medical complication is bone mineralization loss
- Psychiatric co-morbidities are common and complicate and/or prolong treatment course

# Concluding Remarks

- Most laboratory abnormalities are transient specifically transaminase elevations and low grade anemia.
- Certain screening tests e.g. TSH, HCG and celiac screens are not revealing of secondary issues

# Concluding Remarks

- Almost all girls require residential and/or inpatient medical care at some time during the illness
- A significant minority of the girls' Anorexia evolves into a different illness including bulimia, binge/purge, mood disorder, stealing, substance abuse, promiscuity or a combination of these issues

# Concluding Remarks

- 4 of the girls had prolonged amenorrhea >36 months but normal BMD.
- Most girls respond (using weight gain as the measure) to an intensive team therapy which may need to be in place for 5 or more years

# Concluding Remarks

- Of the 25 girls, 6 (24%) at the last weigh-in were in the 95-105% ideal weight range
- 11/25 girls (44%) weighted 95% or higher of their ideal weight
- Reaching ideal weight range did not ensure the patient was symptom free
- Where the current status is known, 15/19 of the girls (79%) were continuing their education

# Concluding Remarks

- Anorexia is a chronic disease requiring significant amounts of time and resources from the patients, families and their clinicians with observation/treatment over an extended period of time
- Early recognition of the illness coupled with aggressive treatment appear to be helpful in bringing on a “cure”
- Intense parental involvement in the treatment, at least for adolescent girls, appears to be helpful

# References from the MGHfC

Division of Adolescent and Young Adult Medicine

