

Eating Disorders and Cardiovascular Diseases

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INTRODUCTION

Eating disorders (EDs) are serious group of syndromes characterized by unusual eating or weight-control behaviours. Negative beliefs about eating, body weight and shape contribute to the initiation and maintenance of these disorders (1). The prevalence of EDs is higher in Western societies and in women (2).

Six principle types of EDs are defined in the The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V): anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED), avoidant-restrictive food intake disorder (ARFID), rumination disorder and pica (3).

AN is a severe mental disorder characterized by serious dietary restrictions and other weight loss behaviors (e.g., vomiting, excessive physical activity) triggered by intensive weight gain anxiety and an uncomfortable body image (4). AN can lead to medical complications that can affect all body systems resulting from malnutrition and weight loss behaviors (1). In addition, the functionality is noticeably impaired (1).

Patients with BN can be present normal or overweight (1). BN is a type of eating disorder in which repetitive episodes of binge eating and compensative behaviors to avoid weight get are seen (5). The most common compensatory behavior is self-induced vomiting, which may also occur with unsuitable medication, fasting, or excessive exercise (5, 6).

BED is a disorder in which recurrent episodes of binge eating are seen with loss of control over eating (7). In BED, compensatory behaviors are not observed

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that underweight ARFID may be exposed to the adverse consequences of malnutrition earlier and longer than AN.

Studies have indicated that cardiovascular disorders including bradycardia, prolonged QTc interval and electrolyte dysregulation (primarily hypokalemia) are among the most common problems requiring inpatient management in patients with ARFID (41).

ARFID is a newly defined type of ED, and the number of studies is limited. More studies are needed to define the nature of the disease and the complications it causes.

CONCLUSIONS

EDs have a high prevalence, especially in the young population, and represent a significant cause of morbidity and mortality. Although EDs affect all organ systems, cardiovascular system complications are important because of the impact of cardiac complications on morbidity and sudden cardiac death.

The cardiac abnormalities seen in AN are mostly due to decreased food intake and are reversible with dietary regulation. While compensatory behaviors seen in BN are responsible for short-term cardiac complications, long-term complications occur due to increased eating behavior. ARFID and BED are newly defined EDs, and the number of studies is limited, further research is needed to better understand the course of the disease and the cardiac complications it may cause.

REFERENCES

- Treasure J, Duarte TA, Schmidt U. Eating disorders. The Lancet. 2020; 395, 899–911. https://doi.org/10.1016/S0140-6736(20)30059-3.
- 2. Qian J, Wu Y, Liu F, et al. An update on the prevalence of eating disorders in the general population: a systematic review and meta-analysis. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity.* 2022; 27, 415–428. https://doi.org/10.1007/s40519-021-01162-z.
- 3. Regier DA, Kuhl EA, Kupfer DJ. The DSM-5: Classification and criteria changes. *World Psychiatry*. 2013; 12, 92–98. https://doi.org/10.1002/wps.20050.
- 4. Casiero D, Frishman WH. Cardiovascular Complications of Eating Disorders. *Cardiology in Review.* 2006; 14, 227–231. https://doi.org/10.1097/01.crd.0000216745.96062.7c.
- Gorrell S, Grange DL. Update on Treatments for Adolescent Bulimia Nervosa. Child and Adolescent Psychiatric Clinics. 2019; 28, 537–547. https://doi.org/10.1016/j.chc.2019.05.002.
- Mehler PS, Rylander M. Bulimia Nervosa medical complications. *Journal of Eating Disorders*. 2015; 3, 12. https://doi.org/10.1186/s40337-015-0044-4.

- 7. Hay P. Current approach to eating disorders: a clinical update. *Internal medicine journal*. 2020; 50, 24–29. https://doi.org/10.1111/imj.14691.
- 8. Aulinas A, MarengiDA, Galbiati F, et al. Medical comorbidities and endocrine dysfunction in low-weight females with avoidant/restrictive food intake disorder compared to anorexia nervosa and healthy controls. *International Journal of Eating Disorders*. 2020; 53, 631–636. https://doi.org/10.1002/eat.23261.
- 9. Gibson D, Workman C, Mehler PS. Medical Complications of Anorexia Nervosa and Bulimia Nervosa. *Psychiatric Clinics of North America*.2019; 42, 263–274. https://doi.org/10.1016/j. psc.2019.01.009.
- 10. Castellini G, Caini S, Cassioli E, et al. Mortality and care of eating disorders. *Acta Psychiatrica Scandinavica*. 2023; 147, 122–133. https://doi.org/10.1111/acps.13487.
- 11. Hambleton A, Pepin G, Le A, et al. Psychiatric and medical comorbidities of eating disorders: findings from a rapid review of the literature. Journal of Eating Disorders. 2022; 10, 132. htt-ps://doi.org/10.1186/s40337-022-00654-2.
- 12. Smythe J, Colebourn C, Prisco L, et al. Cardiac abnormalities identified with echocardiography in anorexia nervosa: systematic review and meta-analysis. *The British Journal of Psychiatry.* 2021; 219, 477–486. https://doi.org/10.1192/bjp.2020.1.
- 13. Sharp CW, Freeman CPL. The Medical Complications of Anorexia Nervosa. *The British Journal of Psychiatry*. 1993; 162, 452–462. https://doi.org/10.1192/bjp.162.4.452.
- 14. Giovinazzo S, Sukkar SG, Rosa GM, et al. Anorexia nervosa and heart disease: a systematic review. Eating and Weight Disorders Studies on Anorexia, Bulimia and Obesity. 2019; 24, 199–207. https://doi.org/10.1007/s40519-018-0567-1.
- Yahalom M, Spitz M, Sandler L, et al. The Significance of Bradycardia in Anorexia Nervosa. *International Journal of Angiology*. 2013; 22, 083–094. https://doi.org/10.1055/s-0033-1334138.
- 16. Sachs KV, Harnke B, Mehler PS, et al. Cardiovascular complications of anorexia nervosa: A systematic review. *International Journal of Eating Disorders*. 2016; 49, 238–248. https://doi.org/10.1002/eat.22481.
- 17. Janzen ML, Malhi N, Laksman ZWM, et al. The QT Interval in Anorexia Nervosa. *JACC: Clinical Electrophysiology.* 2018; 4, 839–841. https://doi.org/10.1016/j.jacep.2018.01.019.
- Frederiksen TC, Krogh Christiansen M, Charmoth Østergaard P, et al. QTc Interval and Risk of Cardiac Events in Adults with Anorexia Nervosa: A Long-Term Follow-Up Study. Circulation: Arrhythmia and Electrophysiology. 2018;11, e005995. https://doi.org/10.1161/CIR-CEP.117.005995.
- 19. Krantz MJ, Blalock DV, Tanganyika K, et al. Is QTc-Interval Prolongation an Inherent Feature of Eating Disorders? A Cohort Study. *The American Journal of Medicine*. 2020; 133, 1088-1094. el. https://doi.org/10.1016/j.amjmed.2020.02.015.
- Spaulding-Barclay MA, Stern J, Mehler PS. Cardiac changes in anorexia nervosa. Cardiology in the Young. 2016; 26, 623–628. https://doi.org/10.1017/S104795111500267X.
- Friars D, Walsh O, McNicholas F. Assessment and management of cardiovascular complications in eating disorders. *Journal of Eating Disorders*. 2023; 11, 13. https://doi.org/10.1186/ s40337-022-00724-5.
- Nakai Y, Fujita M, Nin K, et al. Relationship between duration of illness and cardiac autonomic nervous activity in anorexia nervosa. *Biopsychosocial Medicine*. 2015; 9, 12. https://doi.org/10.1186/s13030-015-0032-6.
- 23. Mazurak N, EnckP, Muth E, et al. Heart rate variability as a measure of cardiac autonomic function in anorexia nervosa: A review of the literature. *European Eating Disorders Review*.2011; 19, 87–99. https://doi.org/10.1002/erv.1081.
- 24. Di Cola G, Jacoangeli F, Jacoangeli F, et al. Cardiovascular disorders in anorexia nervosa and potential therapeutic targets. *Internal and Emergency Medicine*. 2014; 9, 717–721. https://doi.org/10.1007/s11739-014-1107-2.

- Escudero CA, Potts JE, Lam PY, et al. Doppler Echocardiography Assessment of Aortic Stiffness in Female Adolescents with Anorexia Nervosa. *Journal of the American Society of Echocardiography*. 2018; 31, 784–790. https://doi.org/10.1016/j.echo.2018.01.003.
- Lamzabi I, Syed S, Reddy VB, et al. Myocardial Changes in a Patient With Anorexia Nervosa. *American Journal of Clinical Pathology*.2015; 143, 734–737. https://doi.org/10.1309/AJCP4P-LFF1TTKENT.
- 27. Fayssoil A, Melchior JC, Hanachi M. Heart and anorexia nervosa. *Heart Failure Reviews*.2021; 26, 65–70. https://doi.org/10.1007/s10741-019-09911-0.
- 28. Cass K, McGuire C, Bjork I, et al. Medical Complications of Anorexia Nervosa. *Psychosomatics*. 2020; 61, 625–631. https://doi.org/10.1016/j.psym.2020.06.020.
- 29. Oflaz S, Yucel B, Oz F, et al. Assessment of myocardial damage by cardiac MRI in patients with anorexia nervosa: Silent Myocardial Damage in Patients with Anorexia Nervosa. *International Journal of Eating Disorders*. 2013; 46, 862–866. https://doi.org/10.1002/eat.22170.
- 30. Mehler PS, Andersen AE. Eating Disorders: A Guide to Medical Care and Complications. *JHU Press*.2017.
- 31. Çaloğlu M, Özler T. Refeeding (Yeniden Beslenme) Sendromu. *Turkish Journal of Oncology*. 2021; 35(1).https://doi: 10.5505/tjo.2020.2626.
- 32. Voderholzer U, Haas V, Correll CU, et al. Medical management of eating disorders: an update. *Current Opinion in Psychiatry.* 2020; 33, 542–553. https://doi.org/10.1097/YCO.0000000000000653.
- 33. Nitsch A, Dlugosz H, Gibson D, et al. Medical complications of bulimia nervosa. *Cleveland Clinic Journal of Medicine*. 2012; 88, 333–343. https://doi.org/10.3949/ccjm.88a.20168.
- Silber TJ. Ipecac syrup abuse, morbidity, and mortality: Isn't it time to repeal its over-thecounter status? *Journal of Adolescent Health*. 2005; 37, 256–260. https://doi.org/10.1016/j.jadohealth.2004.08.022.
- 35. Tith RM, Paradis G, Potter BJ, et al. Association of Bulimia Nervosa With Long-term Risk of Cardiovascular Disease and Mortality Among Women. *JAMA Psychiatry*.2020; 77, 44. htt-ps://doi.org/10.1001/jamapsychiatry.2019.2914.
- 36. Monteleone P, Santonastaso P, Pannuto M, et al. Enhanced serum cholesterol and triglyceride levels in bulimia nervosa: Relationships to psychiatric comorbidity, psychopathology and hormonal variables. *Psychiatry Research*. 2005; 134, 267–273. https://doi.org/10.1016/j.psychres. 2004.06.019.
- 37. Siri-Tarino PW, Chiu S, Bergeron N, et al. Saturated Fats Versus Polyunsaturated Fats Versus Carbohydrates for Cardiovascular Disease Prevention and Treatment. *Annual review of nutrition*.2015; 35, 517–543. https://doi.org/10.1146/annurev-nutr-071714-034449.
- 38. Mitchell JE, King WC, Pories W, et al. Binge eating disorder and medical comorbidities in bariatric surgery candidates: Binge eating disorder. *International Journal of Eating Disorders*.2015; 48, 471–476. https://doi.org/10.1002/eat.22389.
- 39. Wassenaar E, Friedman J, Mehler PS. Medical Complications of Binge Eating Disorder. *Psychiatric Clinics of North America*. 2019; 42, 275–286. https://doi.org/10.1016/j.psc.2019.01.010.
- Christensen KA, Feeling NR, Rienecke RD. Meta-analysis and systematic review of resting-state high-frequency heart rate variability in binge-eating disorder. *Journal of Psychophysiology*. 2023; 37, 50–63. https://doi.org/10.1027/0269-8803/a000307.
- 41. Strandjord SE, Sieke EH, Richmond M, et al. Avoidant/Restrictive Food Intake Disorder: Illness and Hospital Course in Patients Hospitalized for Nutritional Insufficiency. *Journal of Adolescent Health.* 2015; 57, 673–678. https://doi.org/10.1016/j.jadohealth.2015.08.003.