The Intersectionality of Eating Disorders and Mast Cell Activation Syndrome (MCAS)

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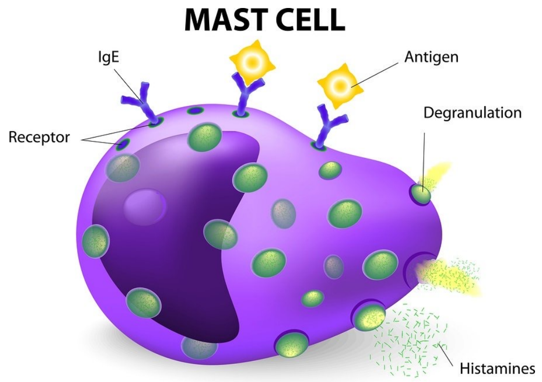
Objectives

- Define and recognize MCAS
- Understand how MCAS can be a barrier to ED recovery work
- Help patients trust their own intuitions about their body and validate their symptoms
- Learn ways to contribute to a multidisciplinary team approach to MCAS treatment

No financial disclosures or relationships

What are mast cells?



- Mast cells are a type of white blood cell and play an important role in our immune system
- Present all over the body → more prevalent in environment facing surfaces like GI tract, lungs, genitourinary system, skin and along blood vessels and nerve endings
- Normal function → Release histamine, tryptase and 1000s of other immune mediators to protect the body from harm

What is MCAS?

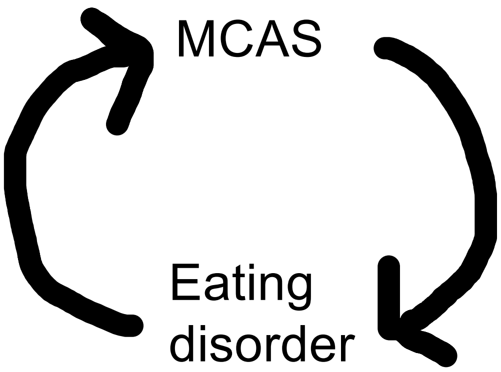
- MCAS → inappropriate release of mast cell immune mediators (histamine, tryptase, etc.) leading to symptoms across multiple organ systems
- Clinical diagnosis based on symptoms and response to treatment
- Female dominated
- 17% prevalence in general population and likely higher prevalence in eating disorders

“There is nothing wrong with you!”

- Patients often visit multiple specialists (i.e., rheumatology, dermatology, gastroenterology, allergy, etc.) seeking answers for frustrating symptoms.
- Real but unmeasurable symptoms → tests are normal
- Must be “just anxiety” or “just the eating disorder”.

Eating disorders and MCAS

- Many persons with MCAS have legitimate physical reactions to food → invalidation in eating disorder treatment world
- The eating disorder team promised (GI) symptoms would improve with weight restoration/nutrition rehabilitation but symptoms are getting worse. “It’s just the ED talking.”
- Doctors can’t find a cause to physical symptoms → undermines one's sense of self, leads to gaslighting and distrust of one’s own body
- Malnutrition/starvation is a major trigger for MCAS



Screening for MCAS: RASH-PF

REACTIONS: Do you feel you have physical reactions to foods, medications, scents, or body products?

ALCOHOL: When you drink alcohol or use alcohol-based products like hand sanitizer, do you get flushed, itchy, have abdominal pain/distress, worsened mood, joint pains, or feel "flu-ish"?

SKIN: Do you often get rashes, hives, or itchy skin?

HEAT: Do you feel unwell, swollen, rashy/itchy, or fatigued after spending time in the heat or sun?

PAIN: Do you experience pain regularly, especially joint, digestive, head, or muscle pain?

FATIGUE: Do you feel chronically or frequently unexpectedly fatigued?

If the patient says yes to 3 or more = positive screening test

Typical MCAS Symptoms

Flushing, itching, rash, redness, hives on the skin, tingly scalp
Feeling feverish with or without an actual elevated temperature
Flu-like illness, “feeling like I’m coming down with something”
Pain especially in joints, abdomen, bones, or muscles
Headache
Drippy or stuffy nose, sinus congestion
Throat clearing
Difficulty breathing/cough
Eye irritation
Swelling (edema) especially of the feet, hands, abdomen, or face
Excessive sweating
Digestive distress like pain/nausea/bloating of the abdomen/loose stools
Surge in depression/suicidality
Mouth sores
Brain fog
Worsening of rapid heart rate
Painful lymph node swelling
Dermatographia

Screening for MCAS: MCAS Q (see handout)

- Symptom presence score - out of 65
- Symptom severity score - out of 96
- Several sections
  - MCAS reactions
  - Organ system specific symptoms:
    - Skin, GI, HEENT, nervous system, heart, breathing, hormones, blood
  - Genetics
  - General/constitutional symptoms
  - Eating disorder presence

Diagnosis: Consensus 1 vs Consensus 2

- Consensus 1
  - Requires severe, episodic and recurrent symptoms but list is very exclusive
    - urticaria, flushing, pruritus, angioedema, nasal congestion, nasal pruritus, wheezing, throat swelling, hoarseness, headache, hypotensive syncope, tachycardia, abdominal cramping, and diarrhea
    - Only involves 5 organ systems. Basically, typical allergy or anaphylaxis symptoms are required.
  - Requires elevated tryptase level on serum sample within 4 hrs of MCAS symptom flare
  - Symptom response to mediator suppressors (i.e., antihistamines) or mast cell stabilizers

May miss 85% of persons who have MCAS!

Diagnosis: Consensus 1 vs Consensus 2

- Consensus 2
  - More inclusive and recognizes complexity of disease
  - Essentially, you meet criteria if you have a "unique constellation of clinic complaints as a result of a pathologically increased mast cell activity." AND symptoms respond, "to any treatment targeted at mast cells or their mediators."
  - Bonus points:
    - Increased mast cells seen on biopsy of bone marrow or GI tract (CD117 stain)
    - Increased mediators captured on blood draw (labs are difficult to obtain due to sample processing requirements, lack of access to labs that can run the tests and financial cost)

General MCAS triggers

- **Alcohol** - including in skin products, makeup, topical and oral
- **Artificial dyes (FD&C red/yellow/blue)** - this sounds orthorexic, but it's real, including in meds. Wherever possible medications should be white.
- **Mold** - generally avoiding residing in places that have clear water damage/mold or mold eradication is really important
- **Extreme heat/sun exposure**
- **Scented skin and home products** – Dye/scent free detergents/laundry products/lotions/etc are often necessary. Beware of scented sprays, candles, air fresheners, etc.
- **Eating disorders** - restriction of calories is highly sustaining of MCAS flares because it's so stressful to the body.
- **Stress** - Emotional and physical (e.g. surgery, injury)

Possible MCAS triggers

- **NSAIDs** – for some patients these are helpful but for others they make symptoms worse. Tylenol/acetaminophen is MCAS friendly.
- **Foods** - patients with MCAS can legitimately react to a broad variety of foods. Goal is to treat MCAS to have less reactivity and less food restriction.
- **Caffeine** - usually stopping this is very helpful.

It is important to avoid or mitigate triggers wherever possible!

Case 1 - Jordan

- Jordan is a 42-year-old non-binary human with OSFED (restriction, bingeing, purging), depression, anxiety and IBS who lives in New York. They are working with a dietitian and therapist towards ED recovery, but they are having lots of GI and skin issues that no one can explain. They are an accountant and often miss work due to these symptoms. They have seen a gastroenterologist, dermatologist, allergist and rheumatologist but no one can identify what is causing their symptoms or how to improve them. Their team is worried there is something more going on then "just the eating disorder."

Case 1 - Jordan

They have random skin itching all the time and will break out in itchy hives if they get too hot. They recently took a summer trip to Europe. It was 100 degrees and they felt ill, fatigued, swollen and itchy. It felt like they were allergic to the sun! They had a good meal plan for the trip, but it was hard to complete just because they physically felt so uncomfortable. They switched their laundry detergent, lotions and soaps to unscented/dye free which really helps. Their skin flushes easily but especially with stress and heat. They constantly have nasal congestion, and their nose runs when they eats. They never drink alcohol because, for some reason, it always makes them feel really ill like they have the flu and worsens their depression.

Case 1 - Jordan

They have a plethora of GI symptoms that have been chalked up to IBS. They have diarrhea and stomach pain often after eating and it also worsens when they are hot or stressed. It’s odd because they had constipation as a child/adolescent but it switched to diarrhea as they became an adult. It feels like they are allergic to many foods but there is no pattern, and they have had negative food allergy testing. They seem to really react negatively to gluten and dairy but are anxious about eliminating these given their eating disorder history. They have awful acid reflux/heartburn and a constant sour taste in their mouth.

Case 1 - Jordan

They have random joint and muscle pains that have not been explained by other specialists. Sometimes pain is debilitating leading to a sick day from work but other days they have no pain at all. They notice that symptoms seem worse at work. They work in an old, poorly ventilated building and there is some mold present on ceiling tiles above their desk. Their itching, congestion and fatigue all seem worse when they are at work vs. home. They have a lot of random, painful mouth sores but not sure why. Finally, they always feel super fatigued more so than their peers. If they could, they would take a nap every day. Doctors haven’t found a cause to these symptoms and chalk it up to their anxiety. The symptoms feel real, but they think maybe they are just overly sensitive.

Case 1 - Jordan

- Jordan likely has mast cell activation syndrome
- Let’s review their triggers
  - Alcohol - could limit/avoid alcohol-based products
  - Mold – explore mold eradication or move offices
  - Heat - Minimize heat exposure as much as able
  - Artificial dyes – i.e., if someone likes M&Ms, try buying chocolate covered peanuts sans colorful coating or if some likes gummy bears, try organic gummy bears which uses natural food dyes.
  - Food – provide education about food sensitivities – avoid elimination diets although may be helpful to utilize gluten and dairy free options until MCAS better managed.
- MCAS Q scores:
  - Symptom presence: 42/65
  - Symptom severity: 46/96

Overall treatment goals

- MCAS is not curable
- Set realistic expectations for treatment – while achieved by some, zero symptoms is not the goal
- Bucket analogy: there will always be some water (MCAS symptoms) in the bucket (human body), but the goal is to keep it from sloshing out or overflowing.
- Giving validation to symptoms that are not "just anxiety" or "all in your head"

Treatment: Medications

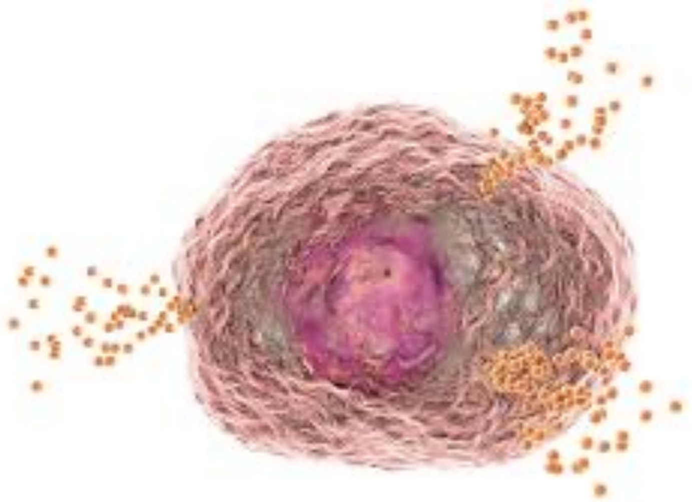
- Goals:
  1. Stabilize the mast cell/prevent degranulation
  2. Block or mitigate the effect of mediators released

Treatment: Medications

- Antihistamines – H1 and H2 blockers
  - H1 blockers
    - 1st generation: diphenhydramine (Benadryl), hydroxyzine (Atarax, Vistaril)
      - Sedating, more powerful anti-cholinergic effects, OTC, crosses blood brain barrier
    - 2nd generation: cetirizine (Zyrtec), levocetirizine (Xyzal), loratadine (Claritin) and fexofenadine (Allegra)
      - Non-drowsy, OTC
  - H2 blockers
    - Cimetidine (Tagamet), famotidine (Pepcid), ranitidine (Zantac)
      - Non-drowsy, OTC

Treatment: Medications

- Antihistamine dosing
  - Start 1 tablet daily to BID each of H1 and H2
    - Ex. Take Pepcid 20 mg BID and loratadine 10 mg BID
  - Increase to 1-2 tablets BID of each if tolerable
  - Potential side effects: dry mouth/eyes, constipation, urinary retention



Treatment: Medications

OTC medications	Starting dose	Max dose
Claritin (loratadine)	10 mg daily-BID	20 mg QID
Xyzal (levocetirizine)	5 mg daily-BID	10 mg QID
Zyrtec (cetirizine)	10 mg daily-BID	20 mg QID
Allegra (fexofenadine)	60 mg daily-BID	120 mg QID
Pepcid (famotidine)	20 mg daily-BID	40 mg BID
Quercetin (Jarrow)	1000 mg BID	1000 mg BID
DAO (SeekingHealth)	1 tablet with each meal	

Treatment: Medications

- Mast cell stabilizers
  - Low dose naltrexone (LDN) – titrate slowly up to 4.5 mg daily in am
  - Cromolyn 100 mg (1 ampule) ACHS (titrate slowly)
  - Montelukast (Singulair) 10 mg 1 daily to BID
  - Quercetin 1000 mg BID (OTC supplement)
  - Ketotifen 1-2 mg daily to BID
  - Xolair injection monthly
  - DAO supplement – OTC, take 1 tablet with each meal
  - Ketamine treatments – can be secondarily helpful if on this for another diagnosis

Treatment

- Treatment often requires trial and error as everyone responds differently to medications
- Requires patience and distress tolerance
- Finding the right combo of meds can take months
- When first diagnosed, many people with MCAS need higher doses and multiple medications to “smolder” the current MCAS flare
- The MCAS regimen can sometimes be simplified at baseline and increased during a flare.

Case 1 - Jordan

- After discussing trigger management, Jordan worked with their provider over 3-4 months to get to this medication regimen:
  - Claritin 10 mg BID
  - Pepcid 10 mg BID
  - Cromolyn 200 mg (2 ampules) before meals and bedtime
  - Low dose naltrexone 4.5 mg daily
  - Singulair 10 mg daily
- They were able to move to a different work location which is in a newer building with no mold and they feel much better at work.

- MCAS Q score:
  - Symptom presence 16/65
  - Symptom severity 14/96

Case 2 - Ryan

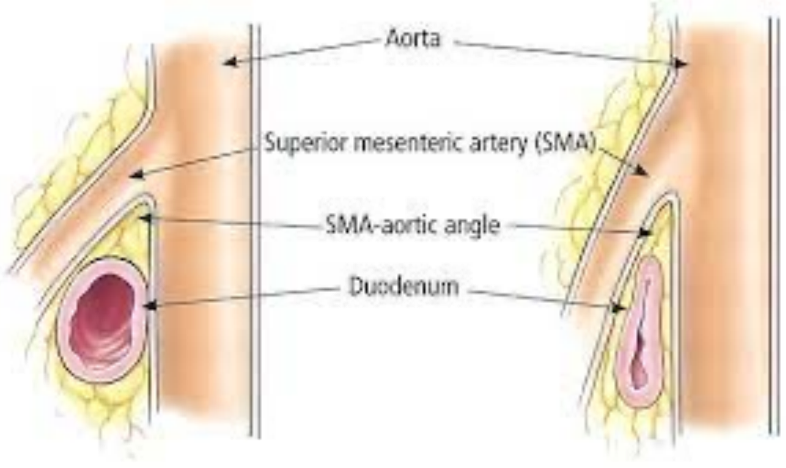
- Ryan is a 36-year-old man with no past medical history accept allergic rhinitis and GERD who presents with severe gastrointestinal symptoms and food intolerances causing weight loss and malnutrition. He has always had annoying GI issues since he was a child, but it has worsened in the past 2 years which seems to correlate with a hard time in his life. His father and grandfather both passed away within 3 months of each other in mid 2020. It was the beginning of the pandemic, so he did not get to see either family member in the hospital before they passed. He has seen his PCP, gastroenterologist, and allergist for his symptoms, but no one can determine what is causing them or how to make them better.

Case 2 - Ryan

- He has tried several elimination diets and would feel better with eliminating dairy, gluten, sugar, etc. but it felt like he had to keep cutting something out every week. Eventually his weight got dangerously low, and he was admitted to a medical stabilization hospital. He was diagnosed with SMA syndrome and ARFID was suspected. He was told he had to eat and restore weight despite his GI symptoms, and they would get better. He was able to restore weight to a more stable place, but his GI symptoms have only worsened, and his weight has been trending down again. He must eat a large amount of calories to maintain his weight and has not been able to add in physical activity. If he does, he loses weight quickly as he can't increase intake to compensate due to GI symptoms. He is seeing an outpatient dietitian and therapist and referred to our clinic for further support.

Superior mesenteric artery (SMA) syndrome

- A natural fat pad surrounds the SMA
- Significant weight loss can lead to compression of third part of duodenum
- Symptoms: pain, early satiety, nausea, vomiting after eating.
- Treatment: liquid meal plan and/or feeding tube.
- Need to restore weight to restore the fat pad



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Case 2 - Ryan

- His current symptoms include epigastric abdominal pain and bloating with eating and urgent diarrhea after he eats. He feels full really fast. He also has a lot of acid reflux and throat phlegm/clearing that worsens after eating or with lying down. He seems to react poorly to all foods. He also has always reacted strongly to medications and often takes pediatric dosing of OTC meds. He always has sinus congestion that worsens in the spring with high pollen counts. He is intolerant of heat and often has random skin itching in hot and humid climates. He is very sensitive to smells and scented products. He must use all unscented soaps and detergents. His wife gets annoyed because he often has nausea and headache with any perfumes or scented lotions.

Case 2 - Ryan

- He is totally in favor of vaccines but has reacted really negatively to both COVID shots with severe body aches, headache, nausea and vomiting for multiple days. He is afraid to get his booster shot but also wants to be protected against COVID. His DXA scan shows osteoporosis in lumbar spine with Z score -2.1. He does not fear weight gain, in fact he wants to gain weight. He doesn't eat dairy or gluten anymore because these seemed to worsen his symptoms and he is fearful of lots of foods because he has had random reactions but can't pinpoint what is causing what.

- Initial MCAS Q score:
  - Symptom presence 39/65
  - Symptom severity 43/96

Case 2 Treatment

- Trigger management
- Consider fully liquid meal plan x 2-4 weeks with Physician's Elemental shakes (Integrative Therapeutics)
  - Heal inflammation in the gut and decrease MCAS reactivity
  - Good nutrition supplement going forward
- Treat small intestinal bacterial overgrowth (SIBO)
- Treat systemic MCAS

Small intestinal bacterial overgrowth (SIBO)

- SIBO - gut motility is impaired enough that bacteria from the lg intestine backs up into the sm intestine causing an overgrowth of bacteria there. This bacteria creates gas which causes bloating and pain in the upper abdomen especially with eating.
- More common in those with MCAS + IBS versus IBS alone
- Diagnosis – clinical vs. SIBO breath test
- Treatment options: antibiotics vs herbals
  - Antibiotics: Xifaxan +/- neomycin 2-4 week course
  - Herbals:
    - Dysbiocide, FC cidal and atrantil – 2 capsules of each twice daily for 4 weeks.
      - Bacteria “die off” between weeks 2-3 can cause worse bloating
    - Biocidin (see handout)

Case 2 - Ryan

Ryan did Elemental shakes exclusively for 3 weeks and we treated SIBO. His diarrhea, bloating and abdominal pain decreased dramatically. I coordinated with his RD who is now helping him reintroduce other foods back in. He will add in dairy and gluten products last to give the MCAS meds time to work. He has seen a decrease in reflux and skin itching. He feels hopeful for the first time in a while and has been able to identify other triggers such as FD&C dyes and mold in his bathroom.

Ryan is now on Zyrtec 20 mg BID, Pepcid 40 mg BID and Cromolyn 2 ampules (200 mg) QID.

We had him increase Zyrtec to 20 mg QID and Cromolyn to 3 ampules QID the day of and day after getting his COVID booster which helped with his reaction.

- MCAS Q score:
  - Symptom presence 12/65
  - Symptom severity 15/96

Case 3 - Jane

Jane is a 28-year-old woman with PCOS, cystic acne, OCD and bulimia nervosa who presents to the clinic with severe skin itching that dermatology and allergy have been unable to help with. She is a teacher and her middle school students have often commented that she is scratching herself a lot. She cannot tolerate taking a shower so has decreased frequency to 2-3x a week. A large component of her anorexia nervosa is compulsive over exercise, but this has been less of an issue since she can't shower every day. She also gets really itchy during exercise. She has tried Benadryl but, instead of it causing drowsiness, it makes her feel jittery and anxious. It does help some with the itching but not fully. Daily Zyrtec was not helpful.

Case 3 - Jane

She often gets swelling in her hands and feet which is worse during the summer when it is really hot outside. She feels like she has seasonal affective disorder but opposite from the norm because her mood is low, and she feels really fatigued during summer months even though she is out of school. Bingeing and purging increases in the summer because she just feels miserable all the time and it's hard to utilize other coping mechanisms. She has a lot of heartburn and fullness after eating. She has been diagnosed with IBS – combined type and will often feel urgency after eating. She often skips lunch at work because, while teaching, she can't go to the bathroom whenever she needs to. She gets random joint pains with no pattern and has had a negative work up for rheumatoid arthritis or lupus.

Case 3 - Jane

- Other history includes very heavy and painful periods that are irregular because of PCOS. She often has to take a sick day from work on the first day of her period because it is so painful and advil only partially helps. She has a history of cystic acne, but this is well managed with spironolactone 50 mg daily. She has known ovarian cysts and one ruptured when she was 17 which was an incredibly painful incident requiring an ER visit. When asked about sinus issues she says, “well yea I have always had a runny nose and postnasal drip.” She thinks this is just how she is. She often must blow her nose after eating which is really embarrassing when she is at work especially in the post-COVID environment.

Case 3 - Jane

- Initial MCAS Q score:
  - Symptom presence 44/65
  - Symptom severity 52/96
- Trigger management
  - Avoid hot showers and heat in general
  - Mold eradication
  - Change cleaning products at work
  - Eating disorder treatment – decrease B/P and overexercise
- Period symptom management
- Systemic MCAS treatment

Hormones and MCAS

- Estrogen receptors exist on mast cells
  - Female puberty can be a trigger for MCAS
  - Symptoms can worsen during ovulation and right before a period
  - Patients with MCAS tend to have more severe period cramping, heavier flow and mood lability
- Testosterone and male puberty does not seem to play a huge role in MCAS
- Cystic breast, cystic acne, cystic ovaries (PCOS) are all more common in MCAS

Hormones and MCAS

- Dysmenorrhea (painful periods)
  - Can place 25-50 mg Benadryl tablets (white/dye-free) intravaginally
  - Can soak a tampon in cromolyn
  - Some patients who were thought to have endometriosis respond well to MCAS flare management leading up to and during their period.
  - Progesterone only birth control methods (i.e. IUD, Nexplanon, etc.) and sometimes OCPs can help by suppressing HPO axis to even out hormones.

Case 3 - Jane

- Jane has now tried several H1 and H2 blockers at max doses to try to relieve her itching. She is taking cromolyn 2 ampules QID and low dose naltrexone 4.5 mg daily. She now uses cromolyn soaked tampons the first 2 days of her period which allows her to not miss work. This regimen has helped with all symptoms but her itching. She qualifies for Xolair prescription (Dx: chronic idiopathic urticaria) and after 3 monthly shots, she is finally feeling some relief with her itching and hives.
- Xolair (omalizumab) – binds to IgE receptors on MCs – limits degree of release of immune mediators
  - Can be approved for chronic idiopathic urticaria (CIU) and asthma

Case 3 - Jane

Now that MCAS and itching are better managed and she can shower daily, Jane’s exercise frequency has increased. She is working with her team to decrease this. Notably, her bingeing and purging behaviors have decreased significantly. She feels like she tolerates food more and has less GI symptoms with eating. This past summer, she generally felt better and made more social plans.

Follow up MCAS-Q:

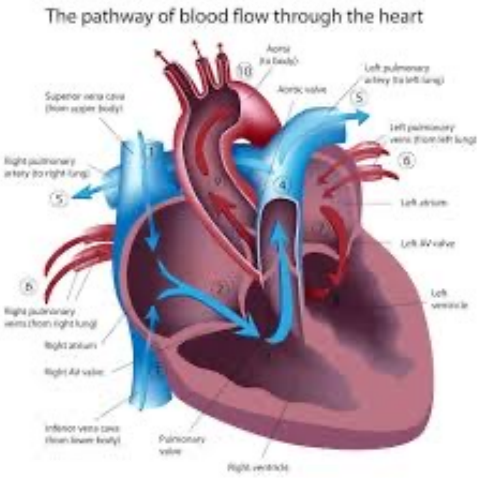
- Symptom presence 12/65
- Symptom severity 15/96

Flare Management 🔥

- Flares can be caused by high stress, psychological trauma, injury, major surgery, etc.
- For flares, H1/H2 blockers can be increased to max doses (see med chart)
- Add on/increase mast stabilizers
- If GI symptoms severely flared where someone isn't tolerating much food, consider full liquid meal plan with Elemental Physician's shakes x 2-4 weeks, gradually reintroduce foods with oversight of dietitian.
- Cromolyn can be applied directly to itchy skin/rash

Postural orthostatic tachycardia syndrome (POTS)

- POTS: increase in heart rate upon standing without orthostatic hypotension
- 40% of those with POTS have MCAS
- POTS can’t be diagnosed when someone is underweight/undernourished → malnutrition mimics POTS
- Mast cells are found near nerves and vasculature and MC mediators enhance responsiveness of sensory neurons
- Treating MCAS helps management of POTS



The pathway of blood flow through the heart

Hypermobile spectrum disorder (HSD) and Ehler-Danlos syndrome, hypermobile type (hEDS)

- Pts exhibit joint hypermobility, skin hyperextensibility and tissue fragility
- Higher prevalence of immune-mediated disorders (rhinitis, asthma, urticaria, celiac disease, functional GI disorders and neuropathies) in hEDS which may be explained by MCA
- Chronic mast cell activation → inflammatory changes at connective tissue level → leads to hEDS?
- hEDS can enhance GI issues – “droopy intestines”, constipation, dysmotility
- “Evil triad” – hEDS, POTS and MCAS

Nutritional considerations

- When flared, MCAS can cause reactions to many foods
  - Not always consistent like a true allergy
  - Ex: When stressed/MCAS flared, client may not tolerate gluten but when less stressed/MCAS managed they may have no issue with gluten
- Ask patients to help differentiate true ED fears vs. physical/MCAS reactions
- Be open to real food intolerances
    - MCAS clients can have sensitivity to or intolerance of gluten without +celiac disease. Believe them. AND caloric inadequacy is never ok.
    - Physicians' Elemental shakes – great supplemental for MCAS clients
    - Leftovers can be MCAS triggering
    - Clients will not have positive IgE allergy testing for the foods they legitimately react to so treatment centers need to be more open to accommodating real MCAS food intolerance.

Nutritional considerations

- Beware MCAS blogs and info online → lots of orthorexic and diet-y recommendations
- Low histamine diets – do not recommend
  - Mast cells release 1000s of mediators not just histamine
  - All foods can trigger MCAS and it can change with time
  - Goal to treat MCAS and ED to keep more foods on the table
  - No use cutting something out that doesn't cause symptoms because it is a "high histamine" food
- Low FODMAP diet
  - Generally, avoid as it is very restrictive
  - Symptoms can change week to week leading to further elimination of foods
  - Can be considered under close supervision of knowledgeable RD but preferably in stable ED and should always be short term/intentional
- Generally, treatment of eating disorders/disordered eating is key for management of MCAS
  - Malnutrition drives MCAS

Challenges to ED recovery

- Untreated MCAS can drive weight gain
  - Mechanism unknown - ?inflammation driven
  - False reassurance after ED treatment admission/refeeding that weight will settle to genetically predetermined baseline – maybe or maybe not
    - High chance of relapse
  - Lots of therapeutic support and education needed to tolerate body’s response to ED treatment especially when MCAS is present

Multidisciplinary approach

- MCAS adds another layer of challenge when supporting someone with an eating disorder
- MCAS can be recognized by any provider → initial OTC treatment can be started
- Validation of legitimate disease from all team members → not just "ED talking"
- Help cope with chronic illness AND separate this from eating disorder → help improve relationship with body
- Internalize that food is not the problem
- Treatment programs → support patients with MCAS, respect need for trigger avoidance and food intolerances.

Thank you!

- Read the book → Sick Enough by Jennifer Gaudiani
- Browse our website gaudianiclinic.com for blogs, videos, articles, etc.
- Follow the Gaudiani Clinic on social media for continued updates on MCAS treatment.

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