



Mast Cell Activation Syndrome (MCAS): A Hidden Epidemic

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Mast cells are an important line of defense for our immune system, but sometimes they go awry and actually attack us.

Mast Cell Activation Syndrome

There is an epidemic of chronic disease in this country. Millions of Americans suffer from multiple diagnoses given by various doctors. For these diagnoses, they are put on an array of medications in an attempt to “stabilize” their condition. They often do not improve and their health may continue to decline over time. These patients are sometimes told their symptoms are imagined, or “psychosomatic.” Until the root cause of the chronic disease is found, these patients will continue to go from doctor to doctor in search of answers they will most likely never get. But what if there was a unifying condition that could explain all of their symptoms and diagnoses? What if there was a root cause that could be identified and then treated?

What is mast cell activation syndrome (MCAS)?

Enter Mast Cell Activation Syndrome or MCAS. MCAS often presents insidiously, slowly worsening over time, with general themes of chronic multisystem inflammation with or without allergic-type problems; there may also be poor healing or other abnormal growth or development in various tissues and organs. The chronic nature of the disease is often punctuated, too, by acute “flares” or “spells” of various symptoms. MCAS originates with the mast cell – a type of white blood cell which produces and releases many signaling chemicals (generically called “mediators”), some of which are pre-manufactured and stored for rapid release in granules within the cell. Mast cells constitute one of our body’s many lines of defense against environmental threats and foreign invaders protecting us from toxic organisms such as parasites, fungus, bacteria and viruses as well as the effects of toxic substances in our environments. The mast cell has many defense mechanisms to help our immune system deal with these toxic assaults on the body, but its most commonly used

mechanism is release of mediators to guide the body's other cells, tissues, organs, and systems to respond to the foreign invasion. It is important to note that mast cells can err and interpret benign substances, such as pollen or food, as toxic. Mast cells can react to assaults more quickly – in sub-second time – than any other type of immune system cell in the body. Over 200 different mediators have been identified as being produced by mast cells.

The one that gets the most press is histamine, an inflammatory chemical whose wide range of effects includes what most people think of as allergic symptoms.

What are the symptoms of mast cell activation disorder (MCAS)?

Under normal circumstances, when mast cells release histamine and other mediators, they are trying to attack whatever they sense (rightly or wrongly) to be foreign, and in the process the released mediators cause inflammation and, sometimes, allergic-type phenomena in our tissues: think runny nose, congestion, cough, itchy eyes and sneezing. These symptoms occur when mediators are released by mast cells in the upper respiratory tract in response to an inhaled foreign allergen, but imagine what happens when histamine and other mast cell mediators get released in other parts of the body inappropriately and not necessarily as a response to something that is foreign. That's when mast cells can cause serious complications. If mast cells activate in your GI tract, you can get nausea, stomach pains, diarrhea or vomiting. If they activate in your brain, you can get anxiety, depression, irritability, and fatigue. If they activate in your skin, you can get rashes, hives, and itching. And there are so many other reactions that we are just starting to understand. The inappropriate, chronic, multisystem release of mediators from mast cells is known as Mast Cell Activation Syndrome, or MCAS.

What other diseases are associated with Mast Cell Activation Disorder (MCAS)?

Research has shown quite a number of conditions where mast cell activation likely play a role in their development. Irritable bowel syndrome is still not well understood, but studies have identified mast cells in the GI tract as likely playing a role in the manifestations of IBS. Mast cells interact with nerve cells in the gut, and when they release their mediators, they send signals to nerve cells, which then can transmit messages of pain or discomfort or cause movement disorders of the intestinal tract. Other pain syndromes have also been reported to be connected with mast cell activation. The fact that mast cells are so intimately involved with nerve cells predisposes patients with mast cell activation syndrome to various neurological manifestations.

Neuropsychiatric disorders such as anxiety, depression, psychosis, ADHD, and even memory loss have been described. Unfortunately, some patients with MCAS have such severe symptoms that they have frequent life-threatening anaphylactoid reactions as well as significant disability and poor quality of life. Although we have known about mastocytosis (a rare cancer-like excessive growth of mast cells) for about a century, we are just beginning to recognize there is a truly large iceberg of mast cell disease overall. Mastocytosis and other diseases easily recognized as being rooted in mast cell misbehavior (such as allergies) are the tip of an "iceberg" of mast cell disease, while MCAS may be the far greater bulk of the iceberg – just "hidden below the waterline" because it clinically

presents in different patients in such different ways which often are difficult to recognize as due to mast cell misbehavior. Further research will shed more light on MCAS and how to help patients suffering it.

How is Mast Cell Activation Disorder (MCAS) Diagnosed?

Diagnosis of MCAS can be challenging and there is no global consensus yet as to diagnostic criteria. Most, though, agree that essential to the diagnosis is first identifying the presence of chronic symptoms, across multiple organ systems, consistent with inappropriate mast cell activation, and then taking care to rule out other diagnoses better accounting for the full set of observed symptoms and findings. Then, one should look (usually in blood and urine) for elevated levels of mediators relatively specific to the mast cell. Many doctors are used to looking for high levels of a mast cell mediator called tryptase when suspecting Mastocytosis but are unaware that in MCAS, tryptase usually stays at levels within the normal range, even when symptoms are flaring. Although the mast cell produces many mediators, most can be measured only in research laboratories at present, and of the minority which can be measured in clinical laboratories, most are not specific to the mast cell. Still, though, there are a few mediators other than tryptase which are both measurable in clinical laboratories and specific to the mast cell. Examples include histamine, prostaglandin D2, and heparin. (Heparin, actually, was the very first mast cell mediator ever discovered, back in the 1930s.) Measurement of some of these mediators is particularly challenging for various reasons including short half-lives and rapid breakdown on exposure to heat.

What are the treatment options for Mast Cell Activation Disorder (MCAS)?

Once MCAS has been diagnosed, the initial treatment focus should be on identifying, and then avoiding, the substances which are inappropriately triggering activation of the patient's dysfunctional mast cells. Triggers may include certain foods, environmental exposures, or even some of the "inactive ingredients," a.k.a. "excipients," in some of their medication and supplement products. Avoiding such substances and being on the lookout for other possible triggers (e.g., in some, heat or cold or ultraviolet light exposure) is important for MCAS patients. For example, if mold is a trigger, eliminating mold exposure may help to control some symptoms and could even be pivotal in gaining significant improvement. For some patients, Mold could even be the root cause that leads to the development of MCAS. For others, environmental toxins and infections act as triggers but also the root cause of the syndrome. There are still many patients in whom the root cause cannot be clearly identified and this is an important area of research for the future. Trigger identification and avoidance can be complicated. Treatment of MCAS can be complicated, too, but the good news is that we have a large array of pharmaceutical and nutraceutical options. There are many drugs and natural compounds which have been identified to inhibit mast cell activation or block the effects of mediators released from mast cells, like histamine. Patients should be under the care of a physician and should be monitored with the use of any of these. The state of our scientific understanding of the disease is so immature at present that we cannot predict which medications are most likely to help which symptoms in which patients. Furthermore, as already

noted, the disease behaves in highly variable fashion from one patient to the next. As such, finding treatment which is optimal for the individual patient often involves much trial and error. Examples of pharmaceutical treatment options include a type of histamine blocker (an “H1” blocker) traditionally used as a treatment for allergies combined with another type of histamine blocker (H2 blocker) traditionally used for treatment of reflux and excessive stomach acid. An example of a natural compound which can help some MCAS patients is Quercetin, which is a plant flavonoid with antioxidant properties, that has powerful mast cell stabilizing effects. There are many different formulations of Quercetin and MCAS patients often need to try different brands before they find one that helps them, if it does at all. Because of potential triggering by various excipients, which can differ from one brand, or formulation, of a medicinal product to the next, the brand or formulation which helps one MCAS patient may be different from what helps another. First recognized only a decade ago, Mast Cell Activation Syndrome is a complex disorder which is prevalent in the chronically ill population. Increasing awareness in patients and their physicians is extremely important and can only help those who have long been mysteriously suffering from the disease.

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