Original Article

# The Mastocytosis Society Survey on Mast Cell Disorders: Patient Experiences and Perceptions☆

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***What is already known about this topic?*** Mastocytosis and mast cell activation syndromes are rare diseases or entities manifested by symptoms that mimic allergies, anaphylaxis, and chronic conditions, and can go unrecognized for many years with unnecessary suffering by patients.

***What does this article add to our knowledge?*** This article provides the first description of the US mastocytosis and mast cell activation syndromes population based on a survey of patients. Results include the length of time to diagnosis, disease impact, symptoms, specific organ systems affected, and associated conditions, such as allergies and triggers.

***How does this study impact current management guidelines?*** This article will provide clinicians with an evidenced-based rationale for a focused investigation of the wide range of symptoms and experiences of patients with suspected or confirmed mastocytosis and/or mast cell activation syndromes.

**BACKGROUND: Mast cell diseases include mastocytosis and mast cell activation syndromes, some of which have been shown to involve clonal defects in mast cells that result in abnormal cellular proliferation or activation. Numerous clinical studies of mastocytosis have been published, but no population-based comprehensive surveys of patients in the United States have been identified. Few mast cell disease specialty centers exist in the United States, and awareness of these mast cell disorders is limited among nonspecialists. Accordingly, information concerning the experiences of the overall estimated population of these patients has been lacking.**

**OBJECTIVE: To identify the experiences and perceptions of patients with mastocytosis, mast cell activation syndromes, and related disorders, The Mastocytosis Society (TMS), a US based patient advocacy, research, and education organization, conducted a survey of its members and other people known or suspected to be part of this patient population.**

**METHODS: A Web-based survey was publicized through clinics that treat these patients and through TMS's newsletter, Web site, and online blogs. Both online and paper copies of the questionnaire were provided, together with required statements of consent.**

**RESULTS: The first results are presented for 420 patients. These results include demographics, diagnoses, symptoms, allergies, provoking factors of mast cell symptoms, and disease impact.**

**CONCLUSION: Patients with mastocytosis and mast cell activation syndromes have provided clinical specialists, collaborators, and other patients with information to enable**

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Conflicts of interest: S. Jennings, N. Russell, and V. Slee have received travel support from The Mastocytosis Society (TMS). M. Castells has received a grant from TMS; has consultant arrangements with Merck, Novartis, and Genentech; and is employed by Brigham and Women's Hospital. P. Valent has received grants from TMS and Novartis, has consultant arrangements with Novartis, and has received a speaker's honorarium from Novartis. C. Akin has consultant arrangements with Novartis and Best Doctors; is employed by Brigham and Women's Hospital; has received grants from TMS; has received travel reimbursement and an honorarium from the Western Society of Allergy; has received travel reimbursement and a waived registration fee from the European Academy of Allergy and Clinical Immunology; has received a waived registration fee from the American Academy of Allergy, Asthma and Immunology; has a patent with the National Institutes of Health for an LAD2 mast cell line; and has received royalties from UpToDate. The rest of the authors declare that they have no relevant conflicts of interest.

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*Abbreviations used*
*AFIRMM- Association Française pour les Initiatives de Recherche sur le Mastocytes et les Mastocytoses*
*CM- Cutaneous mastocytosis*
*IA- Idiopathic anaphylaxis*
*Ig- Immunoglobulin*
*MC- Mast cell*
*MCA- Mast cell activation*
*MCAD- Mast cell activation disorder*
*MCAS- Mast cell activation syndrome*
*MCD- Mast cell disorder*
*RAST- Radioallergosorbent test*
*REMA- Red Española de Mastocitosis*
*SM- Systemic mastocytosis*
*TMEP- Telangiectasia macularis eruptiva perstans*
*TMS- The Mastocytosis Society, Inc*
*UP- Urticaria pigmentosa*

**them to explore and deepen their understanding of the experiences and perceptions of people coping with these disorders.**  **(J Allergy Clin Immunol Pract 2014;2:70-6)**

***Key words:*** *Survey; Mast cell disorders; The Mastocytosis Society; Mast cell activation syndrome; Urticaria pigmentosa; Anaphylaxis; Food intolerance; Insect venom; Trigger; Allergy*

Mature mast cells (MC) are found around blood vessels in all tissues and also where the body interacts with its surroundings, well positioned for quick reaction to environmental threats. MC disorders (MCD) include diseases that involve abnormal proliferation and/or activation of these cells. Patients may have primary MCD or other MC activation syndromes (MCAS),[1-4] sometimes referred to as MC activation disorders (MCAD). People with MCD may be at risk for anaphylaxis and chronic and debilitating symptoms. MCD terminology has evolved as researchers have gained new insights. Clonal MC carrying D816V or other KIT tyrosine kinase mutations have been identified in patients with primary MCD, including mastocytosis and monoclonal MCAS.[1,2,4-6] Cutaneous mastocytosis (CM) usually occurs in children, whereas systemic mastocytosis (SM), which involves internal organs, is generally diagnosed in adults.

Criteria for diagnosing MC activation (MCA) have recently been proposed in a consensus report.[2] MCA occurs by both IgE-dependent and independent mechanisms, which cause MC to release mediators, including histamine, tryptase, arachidonic acid metabolites (eg, prostagladins and leukotrienes), cytokines, and chemokines, which initiate or exacerbate symptoms. Primary MCAS is associated with MCA symptoms and the presence of World Health Organization criteria for SM.[2] MCA can also be present in mastocytosis and lead to reduced quality of life.[2] In other patients, an underlying allergy may be found to cause the MCA; these patients have secondary MCAS. Patients with MCA symptoms without defined clonal MC, or other underlying conditions that might lead to MCA, are diagnosed as having idiopathic MCAS.[2]

The Mastocytosis Society, Inc (TMS) (www.tmsforacure.org), a US-based patient organization, provides support, research, and advocacy for those patients with mastocytosis, MCAS, and related disorders. This article describes a Web-based survey by TMS for people with these disorders. Demographics, diagnoses, symptoms, allergies and/or intolerances, provoking factors of MC symptoms, preventive carrying of epinephrine and/or medical identification, and disease impact on lives are reported. Additional concerns will be described in future reports.

## METHODS

### Study design

The cross-sectional survey questionnaire was developed by the TMS Research Committee (S.J., N.R., B.J.) and executive board members (V.S., L.S.) by using preliminary questions and advice provided by MC specialists (P.V., C.A.). A copy of the survey questionnaire is provided as Figure E1 (in this article's Online Repository at www.jaci-inpractice.org). The survey was open to patients who identified themselves as having an MCD and who were not participating in a similar concurrent European Union survey. Caregivers were instructed to answer all questions for minors and other patients unable to answer for themselves.

**Web site and database development.** Survey questions were converted into an online format (B.J., S.J.). An external company hosted the Web survey, backed by an onsite-encrypted, secure database that was moved to a secure system for analysis after survey closure.

### Survey population, recruitment, and data collection

*Population.* Patients of all ages, or patient caregivers, living in or outside the United States, with mastocytosis, MCAS and/or MCAD, or other MCDs were invited to complete the survey irrespective of TMS membership.

*Publicity.* The survey was publicized in the month before its posting through a TMS publication, *The Mastocytosis Chronicles*, notices in clinics of physicians who work with the society, support groups, the TMS Web site, and online MCD-related blogs.

*Access.* The survey was posted online through a TMS Web site link, between April 15 and May 24, 2010, with paper copies mailed upon request. Entry required checkbox selection that indicated respondents' understanding of survey confidentiality and procedures. After providing consent, the entrants received a unique and confidential user number and password, which allowed them to stop during the survey and return later. A "no charge" telephone number and e-mail address were posted for help with completing responses.

**Data evaluation.** Valid responders were defined as those who answered at least some questions beyond the opening section for Demographics and Diagnosis. Data evaluation was performed by using Excel and Access software (Microsoft Corp, Redmond, Wash). The variable "years until diagnosis" was calculated by subtracting the year of symptoms onset from the year of diagnosis. Some percentages do not sum to exactly 100% due to rounding. In certain cases, percentages less than 5% or missing responses are not reported.

When respondents selected multiple diagnosis options, they were classified as follows: urticaria pigmentosa (UP) or another form of CM, along with MCAS and/or MCAD or idiopathic anaphylaxis (IA), was classified as CM; UP plus SM was classified as SM; UP plus SM and MCAS and/or MCAD, was classified as SM. Those who marked both IA and MCAS and/or MCAD were classified in