Mast Cells in Dermatology

Plenary Lecture by Gunnar Nilsson:

Mast Cells and Skin

Mast cells and their mediators are often associated with different diseases, most commonly allergic diseases, but also skin diseases like urticaria, angioedema, psoriasis atopic eczema or skin tumours. However, mast cells are one of our evolutionary oldest innate cells that have evolved to be equipped with an arsenal of properties that can be used to protect us (1). They have a favourable tissue distribution close to epithelial surface, blood vessels and nerves, mast cells are endowed with a great variety of receptors that the cells use to recognise and respond to both endogenous and exogenous danger signals, including pathogens (2). An interesting aspect of mast cell responses is the broad effect mast cell mediators have on tissue responses, including activation of sensory nerves, endothelial cells (causing vasodilation and extravasation), tissue remodelling, and the recruitment and activation of other cells of the immune system (3). In relation to this it is important to remember that although mast cells have the capacity to release both preformed mediators stored in the granules (e.g., histamine, heparin, proteases), secrete lipid mediators (e.g., leukotrienes and prostaglandins) and secrete de novo synthesised cytokines, chemokines, interferons and growth factors, this does not happen each time the mast cell is activated. The spectrum of released mediators is dictated by the phenotype of the mast cell and the trigger that induces mediator release. Some triggers like IgE-receptor activation leads to degranulation, lipid mediators as well as cytokine release. In contrast, CD30-activation only induces release of chemokines and some pro-inflammatory cytokines (4). Thus, the view that mast cell-activation is rather one-dimensional is not correct; instead one should look upon mast cell activation as a multi-dimensional event with lots of variation dependent on the situation. As a consequence, the function of mast cells in different types of skin inflammatory diseases is rather complex (Fig. 1) (3, 5). In many cases mast cell actions are pro-inflammatory with the release of proteases and TNF-α, IL-8, interferon γ, etc; which are a driving force in inflammatory disorders like psoriasis and atopic eczema. In contrast, under other circumstances mast cells can exhibit an immuno-suppressive phenotype, with the release of IL-10 and TGF-β (Fig. 1). Ultraviolet radiation is one example of exposure that can induce an immuno-suppressive mast cell phenotype (6), which might play a role in epithelial skin cancers. To understand the multifaceted functions of mast cells in diverse skin inflammatory disorders is a big challenge, but nevertheless an important task to undertake. In the era of personalised medicine and the design of new drugs for skin inflammatory diseases, it is of great importance to consider the many functions of mast cells in order to achieve an effective treatment.

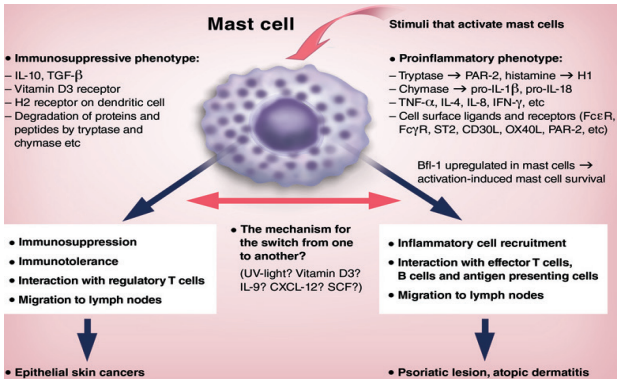

Fig. 1. Mast cells in skin inflammatory disorders. A hypthetical model where the induction of either a pro-inflammatory or immunosuppressive mast cell phenotype is depicted. Figure from (3).

References

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Common and Uncommon Dermatoses on Dark Skin

Assessing skin diseases in dark-skinned patients is a clinical challenge, as there is variation in clinical appearance, for example lack of erythema, hyper- or hypopigmentation, and pigmentary changes can be more severe and prolonged. Some disorders appear to be unique to dark skin and both health care and cultural practices that influence the lesions differ. However, the pattern of skin diseases seen in darker-skinned patients that consult a dermatologist in developed countries resembles those of the white population as represented by acne, cutaneous infection and atopic eczema. Overall, conditions that are specific for dark skin are rather rare.