Confusion, Pruritus, and Purple Skin: A case of Hypereosinophilic Syndrome

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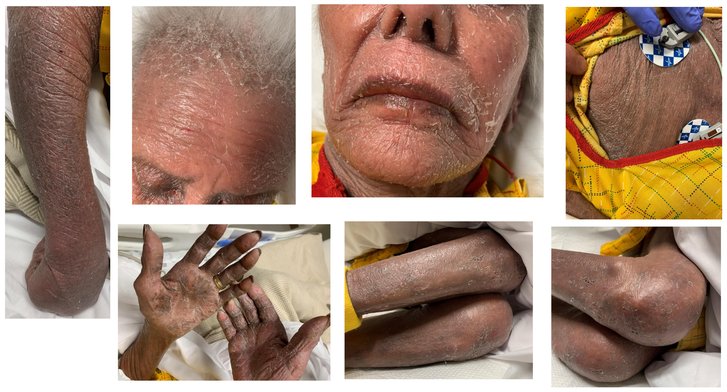
Background

- Hypereosinophilic Syndrome is a rare myeloproliferative disease characterized by at least 6 months of eosinophilia with an absolute eosinophil count of greater than 1500, signs of end organ damage and no clear cause
- Most often effects men ages 20-50 however can effect anyone
- Symptoms are generally non-specific however rash is present in up to 50% of patients
- Can exert effects on skin, lungs, digestive tract, heart, blood and nervous system
- Mechanism is not clearly understood
- Most severe consequence aside from death reported are cardiac in nature including myocardial fibrosis and resultant heart failure
- The following serves to highlight a patient who presented with Hypereosinophilic Syndrome and detail the course and outcome of the patient's care

Case Presentation

- Patient is a 73 year old female with a past medical history of hypertension, diabetes mellitus, chronic kidney disease and recently diagnosed dementia who presented with complaints of "purple" scaly, itchy skin as well as worsening confusion.
- Symptoms had been **ongoing for approximately a year**
- **Recently developed progressive cognitive decline with worsening dermatopathy with no clear cause**
- Per family, the patient followed with a dermatologist for a few months prior to and was **"told she had amyloidosis"**
- Provided biopsy report demonstrated "granular deposition of immunoglobulins on direct immunofluorescence"
- Empiric antibiotics were started out of concern for sepsis in the emergency department however source was unknown and further diagnostics to this point had largely been unrevealing
- **Inflammatory markers and serum IgE were also found to be elevated**
- Repeat skin biopsy was performed
- Ultimately, outpatient rheumatology service was contacted and **glucocorticoids were started with significant improvement in both the patient's rash, mentation and eosinophilia**
- Remaining hospital course was uncomplicated and patient was discharged with plan to continue oral glucocorticoids as well as to follow up with rheumatology

Physical Exam



• Figure 1. Puritic, hyperpigemented rash with scaling. Treatment had been started prior to these examples.

Diagnostics

Complete blood count

	11/13/21	11/14/21	11/16/21	11/17/21	11/18/21	11/22/21	11/27/21
WBC	18.6	12.7	10.7	7.7	8.2	13.4	11.6
EOS %	41.5	13	11.8	0	0	0.4	7.8

One time dose of antibiotics

Intravenous glucocorticoids started!

Oral glucocorticoids started! (11/21/21)

Inflammatory

ESR	48
CRP	8.6

Immunology

IgE	1157

Pathology

Hemogram	ANEMIA, NO SIGNIFICANT MORPHOLOGIC ABNORMALITIES. LEUKOCYTOSIS WITH MARKED EOSINOPHILIA. PLATELET COUNT AND MORPHOLOGY WITHIN NORMAL LIMITS. COMMENT: Consider parasitic infestation, hypereosinophilic syndrome and, less likely, eosinophilic leukemia.
Skin Biopsy	LEFT ARM; PUNCH BIOPSY: SKIN WITH HYPERPARAKERATOSIS, ACANTHOSIS, MILD SPONGIOSIS AND MODERATE DERMAL CHRONIC PERIVASCULAR INFLAMMATION COMMENT DIAGNOSIS: Skin, Left arm (Biopsy): - Negative immunofluorescence study, see comment. Comment: There is no significant linear or granular staining at the dermal-epidermal junction for IgG, IgA, IgM, C3, or fibrinogen. Clinical correlation is recommended.

Discussion

- Hypereosinophilic syndrone was first described in the late 1960s
- Continues to be rare with an overall 5 year survival rate of 80% and its pathophysiological process has largely remained putative
- Generally, symptomatology appears to be mitigated by cytokine release namely interleukin 5
- Cluster of differentiation overexpression due to gene variations have also been described
- Majority of patients respond well to high dose oral prednisone however the present case responded best with intravenous glucocorticoid with rebound of eosinophilia upon transition to oral
- Immunologic agents can be considered in patients with high levels of IL5 (mepolizumab) or when refractory to other treatments
- Interestingly, biopsy did not reveal eosinophilic infiltration which was expected given the severity of the eosinophilia
- It was speculated that the patient's confusion (and diagnosis of dementia) potentially was exacerbated by longstanding eosinophilia
- Unfortunately, the patient returned in December 2021 with worsening confusion and agitation and ultimately succumb to COVID-19 related pneumonia…eosinophilic count was zero percent

Conclusion

- Hypereosinophilic Syndrome remains a rare and enigmatic diagnosis of exclusion
- The current presentation emphasizes the importance of early identification and initiation of treatment
- Questions remain: Additional diagnostic and prognostic information? Immunologic markers and biopsy? Given patient's improvement, they were deferred
- Bone marrow biopsy and hematology/oncology may have guided post-acute care
- Given lack of identifiable cause and improvement on steroids, diagnosis of idiopathic hypereosinophilic syndrome was justified

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