Eosinophilic Cystitis Treatment with Benralizumab

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100% Reduction in eosinophils
Up to 65% improvement in QoL

Bladder biopsy from February 2019 showing numerous eosinophils and eosinophilic microabcess.

Bladder biopsy from January 2020 showing urothelium and continued cystitis but no eosinophils.

Eosinophilic Distress Inventory (UDI-6) short form reported QoL continued to diminish. We administered a validated questionnaire instrument, antibiotic suppressive therapy and antibiotic treatment when indicated by dipstick and had no peripheral eosinophilia. When seen initially in the allergy clinic in May 2019, her skin was found to have eosinophilic infiltrates at up to 100 eosinophils/high power field (fig 1). She of 8mm at the fundus. A bladder biopsy was performed February 2019, and the bladder wall and interstitial cystitis. CT imaging done in January 2019 demonstrated bladder wall thickening and Nickels published in 1949. In the 70 years since then, much remains the same. Eosinophilic cystitis (EoC) is a form of interstitial cystitis characterized by eosinophilic infiltration of the bladder wall. It could be loosely construed as “allergy” in the urinary tract. It was first spece cultured by Tsalikian B in 1948, and in 1960 it was under the term eosinophilic cystitis from 2003 to present yielded 93 citations; furthermore, there are probably no more than 200 cases reported in the English literature. As with other forms of interstitial cystitis, it can lead to significant morbidity and quality of life (QoL) impairment. Urinary frequency and urgency can be debilitating in some cases, with dysuria, incontinence, hematuria and pelvic pain as common presenting symptoms. The etiology of EoC is for the most part unknown, although some reports have been ascribed to medications, infection, bladder trauma, or hypereosinophilic syndrome. Due to the rarity of this condition, most of the information is restricted to small case studies or single case reports. A large pooled analysis of eosinophils published in 2000 found peripheral eosinophilia in 43% of cases and positive urine eosinophils in 26% of patients. Cystitis is currently no consensus about EoC treatment. Symptomatic management has consisted of oral and intravesical corticosteroids, antimastigotes, antihistamines, antibiotics, leukotriene antagonists, immunosuppressives, and in severe cases, surgical intervention. The treatment of eosinophilic disorders has recently been revolutionized by the arrival of monoclonal antibodies (mAbs) directed at interleukin-5 (IL-5), a chemotactic cytokine for eosinophils. These agents have been FDA approved for the treatment of asthma and eosinophilic granulomatous polyps, but other investigations are ongoing for other eosinophilic disorders such as eosinophilic esophagitis. Busse et al. et al. demonstrated a positive correlation between eosinophilic cystitis and IL-5 mAbs in 2010, but to our knowledge, no studies have been reported for this indication. We hypothesize that the IL-5 receptor blocker, benralizumab, may be an effective treatment for EoC by reducing eosinophilic infiltration of the bladder and improving QoL.

Methods
We report here the case of a 78-year-old woman referred to the allergy/immunology practice of W. Donald Cooke MD and Abigail Tarr Cooke BSN RN in Durango, CO for evaluation of bilateral lymphadenopathy and eosinophilia. Physical exam revealed a blood eosinophil count of 58. Following informed consent for off-label use of a biologic intervention to treat EoC, the patient was started at 30mg subcutaneously every four weeks in May 2019. The patient has been followed monthly to assess clinical response. Following the third dose, the patient’s UDI-6 score was reduced to 20, demonstrating a 64% improvement in her urinary symptoms and QoL. The daytime voiding interval remained unchanged for three hours and her nighttime voiding was significantly improved to 6 to 8 nocturnal events per night. She reported no longer feeling ‘helpless and housebound.’ No side effects from the benralizumab were noted. Three separate urine cultures obtained during the course of treatment were negative for group A strep and Klebbsiella species. These were treated with appropriate antibiotics. Her urinary frequency and urgency continued to improve as noted by a marked reduction in her nocturnal voiding frequency. Blood eosinophils have continued to be markedly elevated at 58. Following informed consent for off-label use of a biologic intervention to treat EoC, the patient was started at 30mg subcutaneously every four weeks in May 2019. The patient has been followed monthly to assess clinical response. Following the third dose, the patient’s UDI-6 score was reduced to 20, demonstrating a 64% improvement in her urinary symptoms and QoL.

Acknowledgements: The authors wish to thank Francis Caprio Jr. MD and James Brennan, MD for oncologic and Trent Pinson, MD for pathology. In memory of Ralph L. Williams, Jr., MD Professor Emeritus and former Chief of Medicine, University of New Mexico School of Medicine.