

Letter to the Editor

Prevalence and characteristics of eosinophilic esophagitis in 2 ethnically distinct pediatric populations

To the Editor:

Eosinophilic esophagitis (EoE) is an immune/antigen-mediated disease characterized by symptoms related to esophageal dysfunction and by eosinophil-predominant mucosal inflammation.^{1,2} Age-dependent symptom variability is well recognized in children. A recent study in adult patients reported significant racial/ethnic EoE phenotypic differences³; however, ethnic variations in the clinical/histopathologic properties of pediatric EoE have not been examined. Published data describe findings in predominantly white pediatric subjects.⁴⁻⁷ This report investigates EoE characteristics in a black, inner-city pediatric cohort, and compares findings with those in a rural white population. This study was approved by the respective institutional review boards at SUNY-Downstate Medical Center and at Marshall University.

Children with EoE were identified from all pediatric diagnostic upper endoscopies performed at SUNY-Downstate Medical Center, Brooklyn, New York, and at Marshall University, Huntington, West Virginia, between January 1, 2003, and April 30, 2010. Subjects were excluded if symptoms resolved following acid suppressive treatment. Information obtained from patient records and reflecting standard practice for evaluating EoE at both sites included patient age, ethnicity, symptoms, personal and family history of atopy, peripheral eosinophilia, total IgE, radioallergosorbent test results (cow milk protein, soy protein, wheat, eggs, peanuts/tree nuts, seafood), and endoscopic and histopathologic findings.

Endoscopic findings at diagnosis were identified by reviewing procedure photographs and written reports. Consistent with consensus recommendations^{1,2} and with routine protocols at both sites, at least 1 biopsy each was obtained from the distal and the midesophagus in all subjects. EoE (≥ 15 eosinophils in a single hpf^{1,2}) was confirmed on reexamination by a single pathologist (R.G.). Two-tailed, independent-samples mean tests (for continuous variables) and χ^2 analyses (for noncontinuous variables) were used (SPSS, version 17.0; IBM Corp, Armonk, NY).

Ninety-six patients were eligible for this retrospective study: 44 from SUNY-Downstate and 52 from Marshall University. These numbers represent 3.1% and 3.3%, respectively, of all diagnostic (ie, initial) pediatric upper endoscopies performed at these centers during the study period. All 52 eligible subjects in the WV cohort were white, and all were included. At SUNY-Downstate, 37 of the 44 eligible children were studied. Five black subjects had incomplete clinical data, and the only 2 white subjects with EoE were excluded to maintain group homogeneity. Males were more commonly affected than females in both groups (M:F [black vs white], 2.7:1 vs 3.0:1; P = not significant [ns]). Age ranges were similar (black = 8 months to 17 years; white = 6 months to 18 years); however, the mean age at diagnosis was significantly younger in black subjects (black vs white = 4.5 vs 9.5 years, $P < .001$, 95% CI, 2.5-6.2).

Fig 1 indicates presenting symptoms in both groups. Feeding difficulties, not including vomiting or regurgitation, were

determined on the basis of parental reports of feeding refusal, feeding-associated irritability, gagging, or choking. As described earlier,^{1,2,4} these symptoms were reported more commonly in the younger, black group than in the older, white children (black vs white = 45% vs 13%, $P < .05$). Conversely, dysphagia was more frequent in the older, white subjects (black vs white = 2% vs 23%, $P < .05$). Atopic symptoms were reported in 65% of black and 42% of white patients ($P < .05$), although a family history of atopy trended lower in the black group (black vs white = 35% vs 55%, P = ns). IgE-mediated food antigen reactivity test (radioallergosorbent test) results were positive in 59.6% and 67.6% of white and black children, respectively (P = ns). Reactions to egg, peanut, and cow milk protein were the most prevalent findings and were equally distributed in both subject groups.

At diagnosis, endoscopic EoE abnormalities (esophageal white plaques, trachealization, linear furrowing) were less common in black versus white patients (40% vs 82%, P = .002). In contrast, very high levels of midesophageal eosinophilia were more frequent in black subjects. Peak counts of 15 to 59 cells/hpf characterized 85% (44) of white and 39% (15) of black subjects ($P < .05$), while counts of more than 60 cells/hpf were found in 60% (22) of black versus 15% (8) of white children ($P < .05$).

Because black versus white age distribution was so disparate, histology was compared between age-matched subgroups. Midesophageal eosinophil counts at diagnosis were significantly greater in black patients at age 0 to 2, 3 to 4, 8 to 10, and 11 or more years (Fig 2). In children diagnosed at age 5 to 7 years, eosinophilia also trended higher in the black cohort (P = .057). Mean eosinophil counts in distal esophagus were consistent with EoE in both subject cohorts and also trended higher in black children (all age ranges); however, this difference was not statistically significant (not shown).

Previous reports suggest that black children represent a small percentage of patients with EoE.⁴⁻⁷ Possible interpretations include a true racial predilection for EoE, unique referral patterns, and underdiagnosis in specific groups. In the present report, 96% of the patients (42 of 44) from the Brooklyn cohort, diagnosed between 2003 and 2010, were black. This experience, in addition to the observation that EoE was diagnosed in approximately 3% of all patients aged 0 to 18 years undergoing diagnostic upper endoscopy at both sites (a percentage similar to published, pooled pediatric data⁸), suggests that EoE is prevalent in black children and should be considered in the appropriate clinical setting.

The data also suggest several differences between these black and white subject groups with EoE: (1) the peak incidence at diagnosis in urban, black children was at age 0 to 2 years, with a declining number of new diagnoses with increasing age, while the converse was true in rural, white patients; (2) typical endoscopic features were less commonly reported in the younger, black patients; (3) black children manifested a greater degree of midesophageal eosinophilia. These data, therefore, suggest that black patients exhibit a more aggressive eosinophilic inflammatory response at the time of diagnosis than do similar aged white patients. While a history of atopy was appreciated in many subjects, black patients reported significantly more allergic symptoms, as previously noted.^{7,9} Geographic variations may

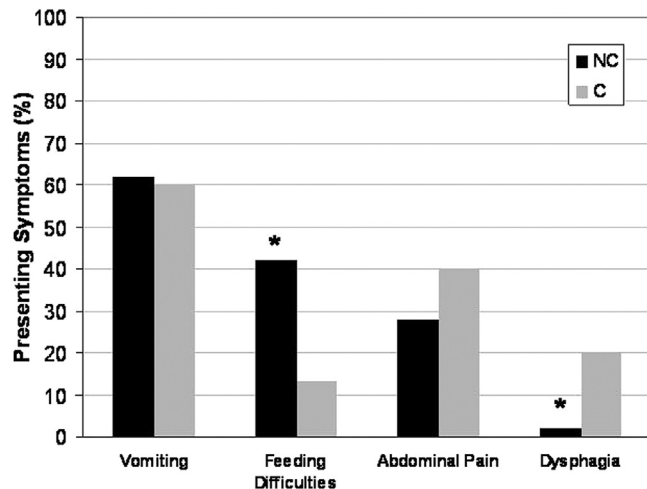


FIG 1. Presenting symptoms of non-Caucasian (NC; n = 37) and Caucasian (C; n = 52) patients with EoE. Several patients presented with more than 1 symptom (NC vs C: * $P < .05$).

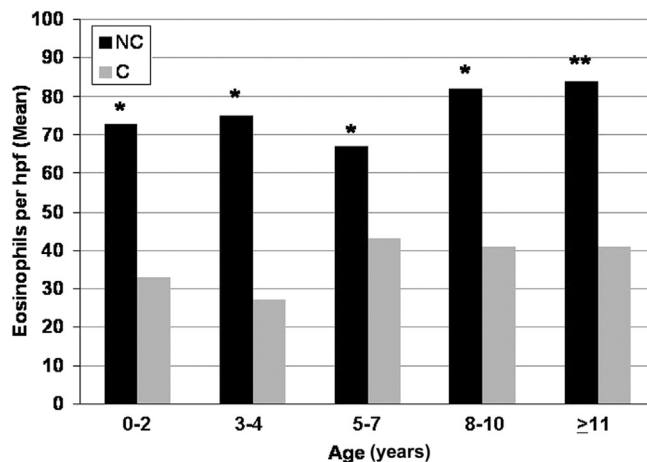


FIG 2. Mean peak eosinophil counts per hpf in midesophageal biopsies, presented in relation to age at the time of diagnostic endoscopy (NC vs C: * $P < .05$; ** $P < .01$). C, Caucasian; NC, non-Caucasian.

also account for the lower percentage of rural patients with allergic symptoms.⁵

Although the present study was conducted before the release of current EoE consensus guidelines,¹ no patients were included following clinical or histopathologic resolution with acid suppression. Also consistent with these recommendations, subjects exhibiting antral and/or duodenal eosinophilia were excluded.^{1,2}

These findings demonstrate the importance of pursuing studies in larger, ethnically diverse subject groups within the same geographic locale, and, importantly, they support the need for increased awareness of EoE by health care providers and parents of black infants and toddlers who are experiencing feeding difficulties.

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