Barrett’s Esophagus in Children and Young Adults
Frequent Association with Mental Retardation

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Since few data are available on epidemiologic features of Barrett’s esophagus in young persons, we reviewed the case records of patients undergoing esophageal biopsies at Children’s Hospital, Boston, from 1982 through 1986. There were 1423 esophageal biopsies obtained from 1173 patients, and histological evidence of esophagitis was present in 397 cases; Barrett’s epithelium was diagnosed in 10 patients (0.9% of total and 2.5% of esophagitis cases). Specialized columnar epithelium was present in seven of these 10 patients. The mean age of those with Barrett’s epithelium was 19.0 ± 7.9 years (range 3.7–27 years) compared to 8.7 ± 6.7 years (range 4 days to 31 years) for all patients biopsied (P < 0.0001); 80% (8/10) of the Barrett’s cases were male compared to 54% of all cases. The relative importance of the possible risk factors was assessed by comparing the 10 patients with Barrett’s with the 541 patients that had esophageal biopsies in calendar years 1984–1985. Mental retardation, a risk factor not previously described for young persons with Barrett’s esophagitis, was present in 70% (7/10) of the Barrett’s patients but in only 15% of all patients biopsied (P < 0.0002). The frequency of mental retardation was also higher, but not significantly so (P > 0.07), in patients with biopsies that were positive for esophagitis (19%) than in those with normal biopsies (14%). No significant differences were found between the Barrett’s group and all patients biopsied in regards to racial origin, prior stricture, or fundoplication.

KEY WORDS: Barrett’s esophagus; risk factors; mental retardation.

Barrett’s esophagus, a condition in which columnar epithelium replaces the normal stratified squamous epithelium of the esophagus (1, 2), arises from gastroesophageal reflux in most cases (3–5). Some information on the epidemiology of Barrett’s esophagus is available in adults (1, 2), and the incidence has been reported to be approximately 2–5% of adults undergoing endoscopic examinations for assessment of esophagitis (6, 7). No such series have been described in children. The usual age of diagnosis is in the fifth decade (1, 2) but a bimodal distribution also has been described with an earlier smaller peak age of diagnosis between 0 and 15 years (8, 9). Most series note a male predominance of cases (1, 2, 7, 10, 11); for unknown reasons, Barrett’s esophagus rarely has been seen in blacks (11–13).

The development of Barrett’s esophagus appears to be associated with chronic gastroesophageal reflux, as the mean duration of symptoms before diagnosis has been reported to be about 10 years (8) and esophageal strictures are commonly noted (14). Other risk factors for Barrett’s esophagus, includ-
ing conditions that predispose to gastroesophageal reflux, have not been well studied. A recent report of adults institutionalized for developmental disability suggested that Barrett’s esophagitis may develop more frequently in this group than in the general population (15). To date, no population studies have been done to confirm this finding.

Three histologic types of columnar epithelia have been described in Barrett’s esophagus: specialized columnar, junctional-type, and gastric fundic type (16). Specialized columnar epithelium has been reported to be the most common type in adults and the least common in children (17, 18).

The purpose of this retrospective study is to determine the incidence, risk factors, histologic type of epithelial change, and outcome of young persons with Barrett’s esophagus who were diagnosed by endoscopic biopsy during a five-year period, 1982–1986, at Children’s Hospital Boston.

MATERIALS AND METHODS

To determine the incidence of Barrett’s esophagus in a population of young people, we reviewed the case records of patients undergoing esophageal biopsies at Children’s Hospital, Boston, for the five-year period from January 1, 1982, through December 31, 1986. All biopsies were obtained using flexible fiberoptic endoscopes after informed consent was obtained from the patient’s parent or guardian. The great majority of the patients were sedated with intravenous meperidine (1–2 mg/kg/dose) and diazepam (0.05–0.1 mg/kg/dose). The most distal esophageal biopsy was obtained 2–3 cm above the gastroesophageal sphincter. Manometric studies were not done routinely to identify the gastroesophageal junction. Lugol’s solution was not instilled via the endoscope to visualize squamous mucosa. All biopsies were oriented by the histopathology technician and embedded to ensure that sections were perpendicular to the mucosal surface. Multiple tissue sections were stained with hematoxylin and eosin (H&E) and occasionally with Alcian blue and the periodic acid–Schiff (PAS) reaction to enhance the identification of the mucin cells. The diagnosis of esophagitis was made if one or more of the following criteria were present: presence of granulocytes (neutrophils or eosinophils) within the squamous epithelial layer, basal zone thickening accounting for more than 20% of the epithelial thickness, or papillary lengthening of greater than 75% of the epithelial thickness. Biopsy size and orientation was adequate for the evaluation of basal zone thickness and papillary length in about three-quarters of the cases; all samples permitted identification of granulocytes within the squamous layer.

The patients undergoing esophageal biopsies were identified from review of the pathology log book, which provided basic information on the age and sex of the patients and results of the biopsy. The hospital charts of all patients diagnosed as having Barrett’s esophagus were reviewed to provide information on clinical presentation, therapy, and follow-up. The hospital charts of each person undergoing esophageal biopsy from January 1, 1984, through December 31, 1985, also were reviewed and the clinical findings compared with those of the Barrett’s patients to provide information on possible risk factors. There were no differences between these two years and the other three years of the overall period in regards to patient referral patterns or selection of patients to be biopsied. The biopsy specimens from each case of Barrett’s esophagus were reviewed by one of us (H.G.) to confirm the diagnosis and to determine the type of metaplastic epithelium. For the purpose of the analysis, patients with Barrett’s were excluded from the total number of children endoscoped and those with esophagitis. Mental retardation was defined as intellectual impairment resulting in placement of the child in a developmental disability program or institution. Quantitative evaluation of intelligence on all patients with mental retardation was not available.

Percentage differences between the two groups were tested for significance by chi-square analysis. Comparison of means was done by Student’s t test.

RESULTS

Incidence. There were 1423 esophageal biopsies obtained from 1173 patients from January 1, 1982, through December 31, 1986, and histologic evidence of esophagitis was present in 397 cases (35%). Barrett’s epithelium was diagnosed in 10 patients, 0.9% of all patients biopsied and 2.5% of the esophagitis cases. At endoscopy, velvety tongues of columnar epithelium, suggestive of Barrett’s esophagus, were visualized in four of the 10 patients.

Barrett’s Patients. Table 1 is a summary of the clinical findings of the patients with Barrett’s esophagus. There were eight males and two females with a mean age of 19.0 ± 7.9 years (range 3.7–27 years, median age 20.4 years). Seven of the 10 patients were mentally retarded, and the mean age for these patients (22.1 ± 4.8 years, median age 20.5 years) was greater than in the three patients with normal intellects (11.7 ± 9.3 years, median age 9.5 years) (P = 0.07). The time of gastroesophageal reflux symptoms before diagnosis of Barrett’s esophagus was similar in the patients with normal intellect as compared to mentally retarded patients (up to eight years) (Table 1).

The mean follow-up of these patients has been 3.5 years, and none have developed esophageal dysplasia or malignancy. Two patients have died from problems unrelated to their Barrett’s esophagus.

Comparison of Risk Factors. A summary of the clinical data completed on all patients undergoing...