Hiatal Hernia and Chronic Unremitting Asthma

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Abstract. An incidence of hiatal hernia of 48.1% was found among 54 children suffering from "chronic unremitting asthma" compared to 13.5% among 74 controls, clearly showing that herniae are more common in asthmatics (P < 0.001). In asthmatic children herniae were more common in those patients whose height and weight approached the mean for their age and sex (0.01 < P < 0.02; P < 0.001 respectively). Asthmatic patients who had normal oesophagi were generally short and underweight. By contrast, no significant difference could be found in controls with and without hiatal herniae with respect to height and weight. The patients' ages, duration of symptoms, and results of respiratory function tests were similar in asthmatic children with and without herniae. The possible clinical implications of these findings are discussed.

Key words: Asthma, hiatal hernia; Mendelson's syndrome; aspiration pneumonia, cystic fibrosis.

One of the characteristic features of asthma is that it is a remitting form of obstructive lung disease, that usually responds to symptomatic therapy [2]. A small number of asthmatic patients exists, however, whose symptoms become chronic and unremitting and who respond poorly to the usual symptomatic therapy. During barium meal examinations conducted on some of these patients for abdominal pain or haematemesis, the authors empirically noted an unusually high incidence of hiatal herniae in them. Several uncontrolled studies also cite asthma or asthma-like attacks as a respiratory complication of hiatal herniae in adults [1, 6, 11] and children [7, 8]. Since patients with chronic unremitting asthma present such difficult management problems, it seemed essential to investigate every possible factor which could have precipitated or aggravated their symptoms. For this reason, the authors planned a prospective study, approved by the Stanford University Human Use Committee, of the incidence of hiatal herniae in patients with chronic unremitting asthma compared to a control group.

Children Studied and Methods

Children Studies

The authors studied 54 children, aged 1–18 years, who suffered from chronic unremitting asthma. This diagnosis was made if an asthmatic patient developed chronic unremitting wheezing or other evidence of chronic unremitting bronchial obstruction which responded poorly to treatment with bronchodilators, steroids, environmental and dietary controls, and hyposensitization. Seventy-four age-matched patients served as controls. All control patients had to have a valid indication for an oesophagram. Thirty-four control patients were chosen because they had severe, long-standing lung disease: cystic fibrosis with chronic obstructive pulmonary disease examined for possible oesophageal varices (12 patients); and, chronic or recurrent areas of pulmonary collapse or consolidation without wheezing, or other evidence of bronchial obstruction, possibly due to recurrent aspiration pneumonias (22 patients), examined to exclude a pharyngeal or oesophageal cause for aspiration. The other 40 control patients had gastrointestinal disease (25 patients: abdominal pain, malabsorption syndrome, ulcerative colitis, Crohn's disease, symptoms suggesting hiatal hernia); neoplastic diseases with suspected involvement of the gastrointestinal tract (5 patients: Wilms' tumor, Hodgkin's disease and leukemia); collagen diseases with suspected involvement of the gastrointestinal tract or peptic ulceration (5 patients: scleroderma, rheumatoid arthritis and systemic lupus erythematosi) and miscellaneous conditions (5 patients: myositis ossificans, arteriovenous fistula, pectus excavatum, congenital heart disease and haemophilia).

The Radiological Studies

Cine oesophagrams were performed on all patients. When all studies had been completed, a radiologist reviewed the cine studies twice, at an
interval of about nine months, without knowledge of the patients' histories. The radiologist did not allow himself access to the existing radiological reports in order not to prejudice his findings. Previously described radiographic criteria were used to diagnose hiatal herniae in younger children [3] (Fig. 1) and adolescents [16] (Fig. 2).

Analysis of Data

The authors tabulated all 128 patients' primary diagnoses with their radiographic findings, and recorded their age, sex, height and weight. The percentile heights and weights of all 128 patients were calculated from charts.

Additionally, in the asthma group, the authors tabulated the age of onset and duration of the asthma, and the patients' residual and total lung volume. The amount of steroids which the asthma patients had received was used as an approximate index of the severity of the disease and was graded from 0 to 4 (Table 1). Statistical analysis was performed on all data.

2 Dr. Byron W. Brown, Professor of Biostatistics, Stanford University, analyzed all data. He performed a Four-Fold Chi-squared test of significance for comparing percentages, a student-t-test for comparing means of quantitative variables, such as percentiles, and determined the mean values, standard deviations, standard errors, t, and P values for each variable. A P-value of less than 0.05 was considered statistically significant with increasing significance attached to values below 0.01 and 0.001. Values below 0.1 were thought to be highly suggestive, whereas values between 0.10 and 0.20 were believed to indicate a trend.