STUDY ON VENTILATORY FUNCTIONS IN ULCERATIVE COLITIS

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SUMMARY: Thirty six patients of ulcerative colitis were included in a controlled study and the lung functions were evaluated among them. There was statistically significant (<0.010) reduction in maximum voluntary ventilation (MVV), Diffusing capacity (DLCo) was also reduced. Though the reduction in DLCo was not statistically significant, the importance of this finding as compared to the controls has been discussed. The findings are suggestive of subclinical restrictive ventilatory abnormality in ulcerative colitis.

Key words: Ulcerative colitis, ventilatory functions.

INTRODUCTION

The etiology of chronic nonspecific ulcerative colitis is still not clearly understood. Autoimmune mechanism is considered to be the most possible cause. Like the other welldefined autoimmune disorders e.g. systemic lupus erythematosus, rheumatoid arthritis, vasculitis, ulcerative colitis is also known to present with multisystem manifestations (1-4). However, reports indicating direct or indirect involvement of lungs in ulcerative colitis are very few.

MATERIALS AND METHODS

Thirty six male patients of ulcerative colitis were selected. The diagnosis of ulcerative colitis was based on clinical profile, sigmoidoscopy and colonoscopy, barium enema examination and histopathology of rectal tissue obtained during sigmoidoscopy/ coloscopy. In 4 cases rectum was not involved. In these cases diagnosis was confirmed by colonoscopy and histopahology of tissue taken during colonoscopy. Chest x-ray was done in all patients. Those with history suggestive of respiratory disease or abnormal chest x ray were excluded from the study. None of the patients or controls were smokers. The lung functions of all of the patients were done prior to commencing a therapy in order to avoid the possible effect of drugs on pulmonary functions.

The lung functions were done on Modern respirometer and the best of three readings were taken. Total lung capacity, functional residual capacity (FRC) and residual volume (RV) were measured using closed circuit "Hi-dilution" method. Diffusion capacity (DLCo) was measured by steady state technique. Thirty six age and sex matched controls were selected in the study.

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RESULTS

The results are shown in Tables 1 and 2. The physical characteristics of the patients and the controls were matching. The maximum minute ventilation (MMV) was significantly reduced (P=0.01) in patients of ulcerative colitis (109.02 ± 3.8) as compared to the controls (126.59 ± 3.61).

The diffusing capacity (DLCo) was also reduced in patients of ulcerative colitis (27.51 ± 0.86) in comparison to controls (31.04 ± 1.55). There was no abnormality in other lung function tests in both the groups.

DISCUSSION AND CONCLUSION

There is a paucity of reports about the lung involvement in ulcerative colitis. Krisner (5) reported thrombotic changes in pulmonary arteries at autopsy. Isenberg (6) described occurrence of pulmonary infiltrates due to vasculitis while Eade (7) and Sharma (8) observed pulmonary functional abnormalities in ulcerative colitis.

In the present study, absence of reduction in the FEV1(Forced expiratory Volume 1) and FVC (Forced

Vital Capacity) ratio in either group ruled out demonstrable obstructive defect in the lung functions. This is in contradiction to the findings of Sharma *et al.* and others (8-10). Eade and others (7,8,10) found significant reduction in diffusing capacity in ulcerative colitis patients. The severity of reduction correlated with the extent and duration of the illness. The present study has also demonstrated reduction in the diffusing capacity of the patients in comparison to the control group, though not statistically significant. The number of patients in this study has been small. If the study is repeated in a large number of patients the difference in diffusing capacity may become significant. The exact pathogenesis of reduction in diffusing capacity is difficult to offer. As such there is no consensus of views regarding the pathogenesis of other extracolonic manifestations of ulcerative colitis. The vasculitis is demonstrated by Isenberg and others (6,11) in one of his cases may explain the pathogenesis and form the basis of further studies in this context.

MVV has been found to be significantly reduced (P=0.01) in the present study. This appears to be due to general debility in a chronic illness causing loss of muscular power and endurance effecting over all respiratory efforts rather than due to actual involvement of lungs.

Sulphasalazine is a drug widely used for the treatment of ulcerative colitis and pulmonary functional abnormalities have been described as side effects of this drug in ulcerative colitis (9). None of the patients in the present study was on any form of the treatment at the time of assessment.

The findings of the present study as well as those of other investigators warrant further studies to evaluate lung functions in large number of patients with concomitant histopathological studies to rule out changes in lung parenchyma and muscles.

Table 1: Age, height and lung functions of patients and normal subjects (Mean ± SEM).

Parameter	Normal subjects (A) n=36	Patients (B) n=36	p value
Age (year)	35.27 ± 1.68	35.82 ± 1.63	NS
Height (cm)	168.51 ± 1.53	168.73 ± 1.50	NS
FVC (l)	4.23 ± 0.68	3.91 ± 0.21	NS
FeV1	3.28 ± 0.14	2.99 ± 0.17	NS
MVV	126.59 ± 3.61	109.02 ± 3.28	<0.01

Table 2: Total lung capacity (TLC), TTS components and lung function capacity in normals and patients (Mean SE).

Parameter	Normal subjects (X) n=36	Patients (Y) n=36	p value
FRC	3.20 ± 0.13	2.97 ± 0.07	NS
ERV	1.62 ± 0.12	1.50 ± 0.08	NS
RV	1.59 ± 0.06	1.47 ± 0.10	NS
TLC	5.82 ± 0.18	5.33 ± 0.13	NS
DLCo	31.04 ± 1.55	27.51 ± 0.86	NS

FRC: Functional residual capacity, ERV: Expiratory reserve volume, RV: Residual volume, TLC: Total lung capacity, DLCo: Diffusion capacity.

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