Pulmonary Involvement in Inflammatory Bowel Disease Patients at Fayoum University Hospital

Thesis for partial fulfillment of M.D degree of Tropical Medicine

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Summary and Conclusion

IBD has become one of the focuses in the field of digestive diseases. In the past 20 years, a variety of basic and clinical studies have been conducted to investigate IBD. It has been regarded as a complicated and systemic disease. There are a variety of well-documented respiratory manifestations of IBD, which can range from mild nonspecific respiratory symptoms through to severe, debilitating sequelae.

Accordingly, our study objectives were: - evaluation of the pulmonary involvement in IBD patients at FUH, assessment of the prevalence and impact of IBD activity and on pulmonary manifestations and investigating the potential impact of different treatment modalities on pulmonary involvement in IBD patients.

While some authors have separately investigated PFTs, HRCT chest and chest symptoms in IBD patients, our study took a comprehensive approach by examining these parameters together, including analysis of their interrelations and associations with IBD type and state. Additionally, we incorporated VBG analysis, which provides valuable insights into the metabolic and respiratory status of IBD patients. By integrating these various parameters, we aimed to provide a more holistic understanding of pulmonary involvement in IBD patients, offering a nuanced perspective on the complex interplay between GIT and respiratory system.

This prospective study involved patients who sought medical advice for IBD at FUH, spanning across the endoscopy unit, outpatient clinic,

internal ward and ICU. Over the time course of our study (from January 2022 to June 2023), 61 patients were enrolled.

In our studied cohort population, females predominated with 52.2%, showing male to female ratio of (1:1.1) and the patient age ranged from18-72 years with mean at 33.67±1.34 years. Analysis of the clinical disease state at time of enrollment into the study revealed that 54.1% of our studied patients were in an active state and 45.9% in remission, corroborates the chronic and relapsing nature inherent in IBD, Within the active disease category, a nuanced severity spectrum emerged, with 21.2% classified as mild, 45.5% as moderate and 33.3% as severe. In terms of therapeutic strategies, most of our patients 86.9% received conventional medical therapy as a first-line treatment even if they were indicated for biological therapy.

Regarding chest Symptoms: In our analysis of chest symptoms within our study cohort, we observed that 47.5% of patients (29 out of 61) experienced such symptoms, with dyspnea being the most common complaint, accounting for 42.6% of cases. Importantly, a significant association was found between respiratory manifestations and disease activity. No significant difference between presence of chest symptoms and IBD type.

In our study, we investigated the HRCT chest results and reported abnormal findings in 42.6% of our studied cohort (26 of 61 patients), with wide spectrum of abnormalities in which pulmonary nodules, interstitial reticulations and atelectasis were the most frequently reported findings. Furthermore, a significant association was observed between abnormal HRCT chest findings and the presence of chest symptoms. However, no

significant difference was found between UC and CD patients regarding HRCT abnormalities or disease activity.

Regarding PFTs results: Upon comprehensive analysis, our study identified a diverse range of patterns among patients, with 15 out of 61 patients (24.6%) exhibiting abnormal PFT results. The interpretation of PFTs results unveiled 11.5% with obstructive patterns, 11.5% with restrictive patterns and 1.6% with mixed obstructive and restrictive patterns. Further scrutiny of the spirometry values unveiled alternating values with mean values results as following; mean FVC at 3.3±0.12, mean FEV1 at 2.56±0.1 and mean FEV1/FVC% at 77.74±1.24.

To the best of our knowledge, we are the first to investigate VBG finding in IBD patients and comprehensive analysis of our results unveiled abnormal VBG findings in 40.9% of our studied cohort (25 of 61 patients). The VBG abnormalities were classified according to VBG interpretations into; compensated respiratory alkalosis 13.1%, respiratory alkalosis 4.9%, respiratory acidosis 8.2%, compensated respiratory acidosis 4.9% and metabolic acidosis 9.8% of the studied cohort. Significant associations were observed between abnormal VBG results and disease activity, as well as between abnormal VBG results and chest symptoms. However, no significant difference was found between VBG results and HRCT chest findings or PFT results.

Therefore, our findings emphasize the multifaceted etiology of respiratory alkalosis in IBD patients, highlighting their increased susceptibility to this condition. This underscores the importance of implementing tailored management approaches that address not only the underlying disease process but also the associated comorbidities, such as anxiety and pain. By adopting a comprehensive approach to patient care,

healthcare providers can better address the complex interplay of factors contributing to respiratory alkalosis in individuals with IBD.

Exploring our correlation analysis: our findings revealed significant correlations between pulmonary involvement parameters (chest symptoms, HRCT findings, PFTs and VBG) and the other investigations in our studied cohort. For example, there were positive and significant correlations between chest symptoms disease state, eosinophils, lymphocytes, ESR and CRP. while PFTs disease type, mayo score and sociodemographic data (Sex, Occupation and marital state). These results highlight the multifaceted nature of the pulmonary manifestations in IBD being affected by the sociodemographic characteristics, hematological data and IBD itself.

our results also revealed positive correlations between key parameters, such as FVC with FEV1, PO_2 with SO_2, HCO_3 with PCO_2, and lactate with PCO_2. These correlations suggest that changes in one parameter may influence the behavior of another, indicating a complex interplay between pulmonary function, VBG and IBD-related parameters.

To conclude pulmonary involvement in IBD patients is not uncommon with abnormal HRCT findings and abnormal PFTs even in absence of chest symptoms. Analysis of VBG results between our patients uncovered the intricate relationship between metabolic and respiratory issues in IBD patients, highlighting their heightened susceptibility to respiratory disturbances. Our correlation analysis also emphasized the multifaceted nature of the pulmonary manifestations in IBD being affected by the sociodemographic characteristics, hematological data and IBD itself.