

Coincidence of obstructive lung disease and obesity at PAF Hospital Islamabad

Faiqa Latif¹, Asif Niaz², Muhammad Tahir³, Afsheen Ishfaq⁴

¹Postgraduate resident, Department of Medicine at PAF Hospital, Islamabad

²Medical Specialist, Department of Medicine at PAF Hospital, Islamabad

³Medical Specialist, Department of Medicine at PAF Hospital, Islamabad

⁴Medical Specialist, Department of Medicine at PAF Hospital, Islamabad

Correspondence:

Faiqa Latif

fajar_karachiite@yahoo.com

Abstract

Objective: To look for presence of obesity in patients presenting with obstructive lung disease and factors associated with obesity in these patients

Study Design: Comparative Cross-sectional Study

Setting and Duration of Study: Medicine and Pulmonology Department Pakistan Air Force Hospital Islamabad. From March 2022 to May 2022

Patients and Methods: A prospective study was conducted on 150 patients suffering from obstructive lung disease diagnosed by consultant pulmonologist on the basis of clinical and spirometry parameters. Body mass index was calculated in all the patients by WHO formula and they were classed as normal, overweight or obese depending upon body mass index. Factors like age, gender, tobacco smoking and ethnicity were associated with presence of obesity among the study participants.

Results: Out of 150 patients of obstructive lung diseases, 85 (56.7%) were male and 65 (43.3%) were female. Mean duration of illness in our target population was 4.63 ± 7.831 years. Out of total study participants, 47 (31.4%) had obesity while 103 (68.6%) did not show obesity and had body mass index less than 30 kg/m². Chi-square analysis revealed that tobacco smoking had statistically significant relationship with presence of obesity among the target population (p-value=0.001).

Conclusion: Around 1/3rd of patients suffering from obstructive lung diseases had comorbid obesity as well. Patients who were tobacco smokers were more at risk of having obesity as compared to those who did not smoke tobacco.

Keywords: Obesity; obstructive Lung disease; Smoking

Cite this article: Latif F. Coincidence of obstructive lung disease and obesity at PAF Hospital Islamabad. BMC J Med Sci. 2023. 4(2):92-95

Introduction

Obstructive lung diseases are a challenge for health care professionals of various specialties including internal medicine, pulmonary, rehabilitation, emergency and general physicians.¹ Pakistan bears a substantial burden of chronic debilitating diseases, impacting the quality of life for patients in various ways.^{3,4} These diseases actually affect multiple organ systems directly or indirectly and make it difficult for treating team to cater for all the problems simultaneously with minimum iatrogenic harm with medications or other procedures.

Multiple comorbid conditions are seen in patients suffering from obstructive lung diseases which may be either related to cause or consequence of underlying lung pathology. A lot of conditions may be related to life style modifications or

treatment options used in these patients. Diabetes mellitus, hypertension, ischemic heart disease, auto immune diseases, depression and obesity are some of common medical conditions seen in these patients.^{5,6} Treating team should have adequate knowledge about these conditions in order to provide holistic management to these patients.

Multiple studies have been done in west regarding exploration of relationship between obesity and obstructive lung diseases and impact of obesity on long term prognosis of these chronic diseases. Peters et al. in 2018 published an interesting paper regarding obesity and asthma and highlighted that obesity makes asthma very difficult to manage and make it a completely different syndrome as compared to asthma without obesity.⁷ Benslimane et al. investigated the correlation between obesity and chronic obstructive pulmonary disease in Moroccan adults in the year 2021. Top of Form

Authorship Contribution: ¹Substantial contributions to the conception or design of the work; or the acquisition, Final approval of the version to be published & Supervision, Data analysis, Literature review, Drafting the work or revising it critically for important intellectual content

Funding Source: none

Conflict of Interest: none

Received: June 27, 2023

Accepted: Sep 5, 2023

Published: Dec 20, 2023

They came up with the findings that COPD and overweight were in inverse relationship and regardless of gender and tobacco smoking status this inverse relation persisted.⁸ Galesanu et al. evaluated “obesity paradox” in their study published on French patients suffering from obstructive lung diseases. They concluded that initially the results showed obese had better survival but it was not statistically significant and when factors like hypercapnia, exercise capacity and muscle mass were included in the survival analysis, results were different and less obese had better survival.⁹

Holistic approach towards management of a chronic illness remain key for better outcome and prognosis. A lot of sociodemographic factors and presence of comorbid illness can alter the management outcome despite adequate treatment of underlying disease. Razzaq et al. published a study in 2018 in biggest city of Pakistan Karachi, regarding various epidemiological statistics of asthmatic illness.¹⁰ Overall prevalence of asthma in local population was 1.8% and around 22% patients were either overweight or obese. Limited local data had been available regarding epidemiological statistics of obesity in various obstructive lung diseases. We therefore planned this study with the rationale to look for presence of obesity in patients presenting with obstructive lung disease and factors associated with obesity in these patients.

Material and Methods

This cross-sectional study took place at the Medicine and Pulmonology Department of Pakistan Air Force Hospital Islamabad from March 2022 to May 2022. The sample was collected through non-probability consecutive sampling, with the sample size determined using the WHO sample size calculator based on a population prevalence of obesity in obstructive lung disease patients at 24.1%, with a margin of error of 10%.

Inclusion criteria: It involved patients aged 18 to 65 reported in the medicine or pulmonology department diagnosed with any obstructive lung disease by a consultant medical specialist or pulmonologist.

Exclusion criteria: It included patients below 18 or above 65 years, those with unclear pulmonary symptoms diagnosis, pregnant individuals, and those diagnosed with pneumonia, lung cancer, interstitial pulmonary disease, bronchiectasis, active pulmonary tuberculosis, or uncontrolled diabetes or any other unmanaged metabolic disorder.

Ethical approval was obtained from the ethical review board committee of Pakistan Air Force Hospital (letter no: IH/76077/5/Trg) prior to the study. After securing written informed consent, patients diagnosed with obstructive lung diseases in the medicine/pulmonology unit of PAF Hospital

Islamabad, meeting the inclusion and exclusion criteria, were enrolled. Diagnosis of obstructive lung diseases (COPD, Asthma, Chronic bronchitis, and emphysema) relied on clinical, radiological, and laboratory findings by consultant medical specialists or pulmonologists. The body mass index of participants was calculated using the WHO formula, and individuals were classified as obese if their body mass index exceeded 29 kg/m². Detailed tobacco smoking history was recorded to categorize patients as tobacco smokers.

Statistical analysis, conducted using the Statistics Package for Social Sciences version 24.0 (SPSS-24.0), involved calculating mean and standard deviation for the age and duration of illness of participants. Frequency and percentages for gender and the presence or absence of obesity were also determined. Pearson chi-square analysis was employed to explore the association between various socio-demographic factors and the presence of obesity among the study participants, with significance set at p-values less than or equal to 0.05

Results

This study included 150 patients with obstructive lung disease, selected based on predefined inclusion and exclusion criteria. Among the total participants, 85 (56.7%)

| Study parameters | N (%) |
|--------------------------|-------------------|
| Age (years) | |
| Mean + SD | 52.44 ±5.67 years |
| Range (min-max) | 19 years-65 years |
| Mean duration of illness | 4.63±7.831 years |
| Gender | |
| Male | 85 (56.7%) |
| Female | 65 (43.3%) |
| Body mass index | |
| Normal | 89 (59.3%) |
| Overweight | 14 (9.3%) |
| Obese | 47 (31.4%) |
| Ethnicity | |
| Punjabi | 75 (50%) |
| Sindhi | 30 (20%) |
| Pathan | 27 (18%) |
| Balochi | 9 (6%) |
| Others | 9 (6%) |

were male, while 65 (43.3%) were female. Table-I summarized the general characteristics of study participants. Mean duration of illness in our target population was 4.63±7.831 years. Out of total study participants, 47 (31.4%) had obesity while 103 (68.6%) did not show obesity and had body mass index less than 30 kg/m².

Table-II showed the results of chi-square analysis. It was revealed that significant relationship exists between tobacco smoking and presence of obesity in patients suffering from obstructive lung disease (p-value-0.001).

Discussion

A considerable number of patients managed for obstructive lung disease had obesity. Tobacco smokers were more at risk of having obesity than non-smokers. COPD and Asthma are commonly encountered lung pathologies in patients of all age groups. Unfortunately, no cure is currently available for these conditions. Available treatment options only control the severity of illness and prevent exacerbations. Clinical condition becomes more challenging for patient and treating team when comorbid illnesses are present. Obesity is considered as mother of pathologies and give rise to multiple health related issues. It also complicates situation in terms of use of management options. We conducted this study with an aim to look for presence of obesity in patients presenting with obstructive lung disease and factors associated with obesity in these patients

| Factors | No obesity | Obesity | p-value |
|-----------------|------------|------------|---------|
| Age | | | |
| 18-40 year | 36 (34.9%) | 16 (34.1%) | 0.914 |
| >40 | 67 (65.1%) | 31 (65.9%) | |
| Gender | | | |
| Male | 58 (56.3%) | 27 (57.4%) | 0.896 |
| Female | 45 (43.7%) | 20 (42.6%) | |
| Ethnicity | | | |
| Punjabi | 47 (45.6%) | 28 (59.5%) | 0.155 |
| Sindhi | 23 (22.3%) | 07 (14.8%) | |
| Pathan | 17 (16.5%) | 10 (21.2%) | |
| Balochi | 08 (7.7%) | 1 (2.1%) | |
| Others | 08 (7.7%) | 1(2.1%) | |
| Tobacco smoking | | | |
| No | 81 (78.6%) | 24 (51.1%) | 0.001 |
| Yes | 22 (21.4%) | 23 (48.9%) | |

Vermont Diabetes Information System in USA was analysed to look for relationship of obesity and pulmonary obstructive diseases in 2021. It was concluded that patients with diabetes and female patients have more chances of having obesity and obstructive pulmonary disease together.¹⁵We published data from one hospital and our findings suggested that obesity is quit prevalent in patients having obstructive pulmonary diseases and tobacco smokers were more at risk of having these two ailments together.

Park et al. in 2017 published two-year data regarding effect of obesity on mild to moderate COPD.¹⁶It was concluded that patients who were obsess had poor short term and long term repose to management and it was considered as a difficult phenotype of obstructive lung disease in terms of treatment. We did not study the impact of obesity on outcome but just tried to looked for coincidence of both conditions and found out that around 1/3rd of patients presenting with obstructive lung diseases were obese.

Iyer et al. in 2018 looked this phenomenon from another perspective and tried to highlight options to resolve obesity

paradox in patients suffering from chronic obstructive pulmonary disease. They revealed that more than 1/3rd of the patients suffering from COPD had obesity and obesity inversely affected all the clinical and outcome parameters in these patients.¹⁷Our results supported their findings to epidemiological data extent as we did not go for assessing outcome.

In 2020, Huber et al. conducted research on the enduring relationship between BMI change and health-related quality of life in individuals with obesity and COPD. Their findings revealed that obese COPD patients who experienced an increase of four or more BMI points over a period of 5 years reported significantly lower scores across various dimensions of both generic and disease-specific health-related quality of life compared to their counterparts with a stable BMI.^{Top}Form Our study design was slightly different but strengthened the results of Huber et al. from our own set up point of view as it provided baseline data of obesity indices in COPD patients.

Study limitations

Study design could not enable us to understand temporal relationship of obesity and obstructive lung disease. Moreover, sample size was small in order to generalize the findings to population of this area. Studies with adequate sample size and better design preferably prospective cohort may give better results and also enable us to understand the temporal relationship between the variables.

Conclusion

Around 1/3rd of patients suffering from obstructive lung diseases had comorbid obesity as well. Patients who were tobacco smokers were more at risk of having obesity as compared to those who did not smoke tobacco. conflict of interest none, acknowledgment none

References

1. Ho T, Cusack RP, Chaudhary N, Satia I, Kurmi OP. Under-and over-diagnosis of COPD: a global perspective. *Breathe*. 2019 Mar 1;15(1):24-35.
2. Rajkumar P, Pattabi K, Vadivoo S, Bhome A, Brashier B, Bhattacharya P, Mehendale SM. A cross-sectional study on prevalence of chronic obstructive pulmonary disease (COPD) in India: rationale and methods. *BMJ open*. 2017 May 1;7(5):e015211.
3. Khan MA, Khan MA, Walley JD, Khan N, Sheikh FI, Ali S, Salahuddin E, King R, Khan SE, Manzoor F, Khan HJ. Feasibility of delivering integrated COPD-asthma care at primary and secondary level public healthcare facilities in Pakistan: a process evaluation. *BJGP open*. 2019 Apr 1;3(1).
4. Masjedi M, Ainy E, Zayeri F, Paydar R. Assessing the prevalence and incidence of asthma and chronic obstructive pulmonary disease in the Eastern Mediterranean region. *Turkish thoracic journal*. 2018 Apr;19(2):56.

5. Matsunaga K, Harada M, Suizu J, Oishi K, Asami-Noyama M, Hirano T. Comorbid conditions in chronic obstructive pulmonary disease: Potential therapeutic targets for unmet needs. *Journal of Clinical Medicine*. 2020 Sep 24;9(10):3078.
6. Butler SJ, Li LS, Ellerton L, Gershon AS, Goldstein RS, Brooks D. Prevalence of comorbidities and impact on pulmonary rehabilitation outcomes. *ERJ open research*. 2019 Oct 1;5(4).
7. Peters U, Dixon AE, Forno E. Obesity and asthma. *Journal of Allergy and Clinical Immunology*. 2018 Apr 1;141(4):1169-79.
8. Benslimane A, Garcia-Larsen V, El Kinany K, Alaoui Chrifi A, Hatime Z, Benjelloun MC, El Biaze M, Nejjari C, El Rhazi K. Association between obesity and chronic obstructive pulmonary disease in Moroccan adults: Evidence from the BOLD study. *SAGE Open Medicine*. 2021 Jul;9:20503121211031428..
9. Galesanu RG, Bernard S, Marquis K, Lacasse Y, Poirier P, Bourbeau J, Maltais F. Obesity and chronic obstructive pulmonary disease: Is fatter really better?. *Canadian respiratory journal*. 2014 Oct;21:297-301.
10. Razzaq S, Nafees AA, Rabbani U, Irfan M, Naeem S, Khan MA, Fatmi Z, Burney P. Epidemiology of asthma and associated factors in an urban Pakistani population: adult asthma study-Karachi. *BMC pulmonary medicine*. 2018 Dec;18:1-3..
11. Verberne LD, Leemrijse CJ, Swinkels IC, van Dijk CE, de Bakker DH, Nielen MM. Overweight in patients with chronic obstructive pulmonary disease needs more attention: a cross-sectional study in general practice. *NPJ primary care respiratory medicine*. 2017 Nov 22;27(1):63.
12. Choi JY, Rhee CK. Diagnosis and treatment of early chronic obstructive lung disease (COPD). *Journal of Clinical Medicine*. 2020 Oct 26;9(11):3426..
13. Haase CL, Eriksen KT, Lopes S, Satyrganova A, Schnecke V, McEwan P. Body mass index and risk of obesity-related conditions in a cohort of 2.9 million people: Evidence from a UK primary care database. *Obesity science & practice*. 2021 Apr;7(2):137-47..
14. Paik SH, Yeo CD, Jeong JE, Kim JS, Lee SH, Kim SJ, Kim DJ. Prevalence and analysis of tobacco use disorder in patients diagnosed with lung cancer. *PLoS One*. 2019 Sep 6;14(9):e0220127.
15. Ramos-Nino ME, MacLean CD, Littenberg B. Association between prevalence of obstructive lung disease and obesity: results from The Vermont Diabetes Information System. *Asthma Research and Practice*. 2021 Dec;7(1):1-6.
16. Park JH, Lee JK, Heo EY, Kim DK, Chung HS. The effect of obesity on patients with mild chronic obstructive pulmonary disease: results from KNHANES 2010 to 2012. *International Journal of Chronic Obstructive Pulmonary Disease*. 2017 Feb 24:757-63.
17. Iyer AS, Dransfield MT. The "obesity paradox" in chronic obstructive pulmonary disease: can it be resolved?. *Annals of the American Thoracic Society*. 2018 Feb;15(2):158-9.
18. Huber MB, Schneider N, Kirsch F, Schwarzkopf L, Schramm A, Leidl R. Long-term weight gain in obese COPD patients participating in a disease management program: a risk factor for reduced health-related quality of life. *Respiratory Research*. 2021 Dec;22:1-9..