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Research Article

**PREVALENCE OF NON-ASTHMATIC EOSINOPHILIC
BRONCHITIS AMONG PATIENTS PRESENTING WITH
CHRONIC COUGH**Muhammad Iqbal Shah¹, Rashid Ahmed Khan², Mumtaz Ali Lakho³^{1,3} Department of Medicine - Liaquat University of Medical & Health Sciences, Jamshoro² Department of Pulmonology – Liaquat University of Medical & Health Sciences, Jamshoro**Abstract:**

Objective: Eosinophilic bronchitis is a condition brought to greater attention of the healthcare community recently, as a probable cause of chronic cough by fresh evidence based literature. This study hopes to investigate the prevalence of non-asthmatic eosinophilic bronchitis among patients presenting with chronic cough at our study setting.

Methodology: This observational, cross-sectional analysis was conducted at the department of general medicine and chest medicine at Liaquat University Hospital, Jamshoro upon a total of 200 patients presenting with chronic cough (dating back to at least more than 8 weeks) from September 2017 to January 2018 after taking verbal informed consent. A suggestive chest radiograph and sputum eosinophil count of more than 3% was considered indicative of non-asthmatic eosinophilic bronchitis.

Results: Among the study subjects, 60% of the sample comprised of males, while the remaining 40% were females. The mean age of the study population was 39 years, with 26% of the total subjects i.e. 52 patients testing positive for non-asthmatic eosinophilic bronchitis.

Conclusion: After careful consideration, the obtained results show that prevalence of eosinophilic (non-asthmatic) bronchitis, is marked among the study population. Routine sputum analysis is thus recommended for all patients presenting with chronic cough.

Keywords: Eosinophilia, Bronchitis, Asthma, Chronic Cough and Sputum Eosinophilia.

Corresponding author:**Muhammad Iqbal Shah,**

Department of Medicine,

Liaquat University of Medical & Health Sciences,

Jamshoro

Email Address: muhammadiqbalshah22@gmail.com

Contact Number: +92-300-3034963

QR code



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INTRODUCTION:

Chronic cough is an important and difficult clinical problem for physicians. In patients seeking medical attention, the most common causes of chronic cough in nonsmokers are postnasal drip syndrome (PNDS), cough-variant asthma (CVA) and gastroesophageal reflux disease (GERD).

Chronic cough is often simultaneously due to more than one condition. [1, 2] However, in many patients, no associated clinical conditions are present and this group is usually labeled as idiopathic chronic cough. [3] Gibson and colleagues, [4, 5] described a group of patients with corticosteroid-responsive chronic cough who had sputum evidence of an eosinophilic bronchitis like asthma, but unlike asthma these patients had no objective evidence of variable air-flow obstruction or bronchial hyper-reactivity (BHR). It has been shown that eosinophilic bronchitis is the cause of cough in 10 - 20% of patients presenting to a respiratory specialist. [2, 6-7]

Non asthmatic eosinophilic bronchitis (originally termed “eosinophilic bronchitis without asthma” by Gibson et al.) [8] is pathologically similar to asthma with sputum and tissue eosinophilia, but is physiologically different from asthma in that it lacks airway hyper-responsiveness (AHR). [8] It was not proposed as a distinct entity initially but aroused some controversy as to the relationship between eosinophilic airway inflammation and AHR. It is now considered an important cause of chronic cough, and a study by Brightling et al. involving sputum induction as a routine diagnostic tool has attributed 13% of chronic cough cases to non-asthmatic eosinophilic bronchitis. [9]

Cough was originally described as productive, but many patients have non-productive cough. It is important to know how commonly eosinophilic

bronchitis causes chronic cough, since in contrast to cough in patients without sputum eosinophilia, the former responds well to corticosteroids. [7] The aim of this study is thus to identify the prevalence of non-asthmatic eosinophilic bronchitis as a cause of chronic cough among patients presenting at our study setting.

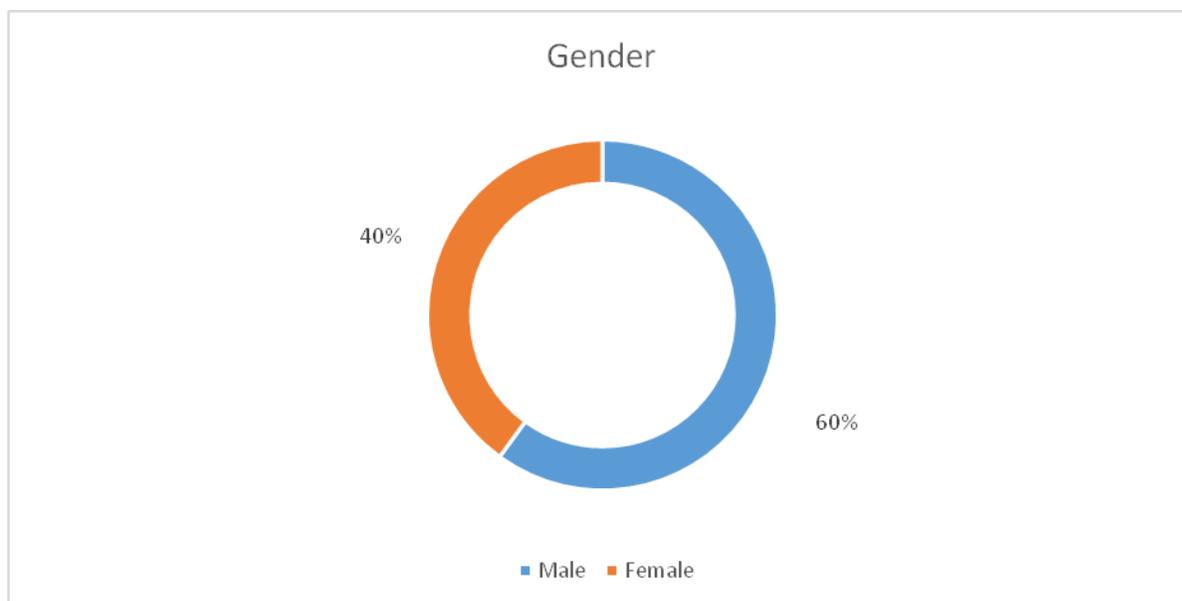
METHODOLOGY:

This observational, cross-sectional analysis was conducted at the department of general medicine and chest medicine at Liaquat University Hospital, Jamshoro upon a total of 200 patients presenting with chronic cough (dating back to at least more than 8 weeks) from September 2017 to January 2018 after taking verbal informed consent. A suggestive chest radiograph and sputum eosinophil count of more than 3% was considered indicative of non-asthmatic eosinophilic bronchitis since, the presence of sputum eosinophilia is essential to the diagnosis of NAEB, while it is merely characteristic of, but not indispensable to, asthma or cough-with-asthma (CVA), which may involve a heterogeneity of sputum cellular profiles such as neutrophilia. [10-12]

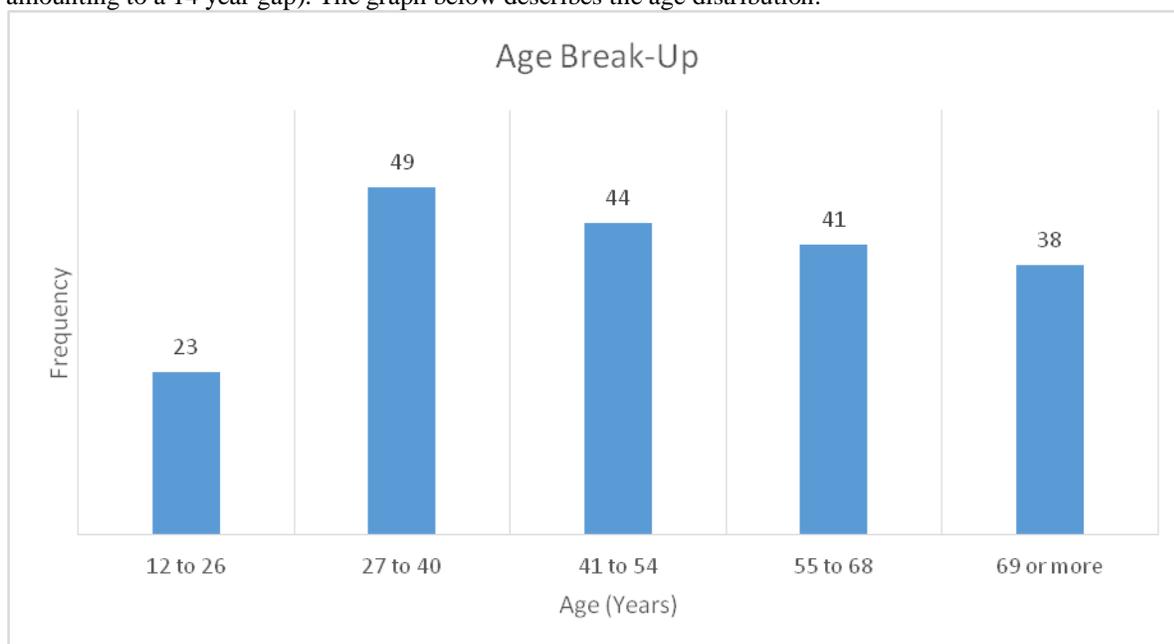
Sputum induction is not always successful, [13] and thus only the subjects whose sputum was successfully induced (in quantities ample for investigation to be carried out), were included in the sample. It is unknown whether other methods to assess eosinophilic inflammation, such as exhaled nitrogen oxide (NO) measurements, can be used as an alternative diagnostic tool. Thus, we only used radiological evidence and sputum eosinophilia as diagnostic tools in this study.

RESULTS:

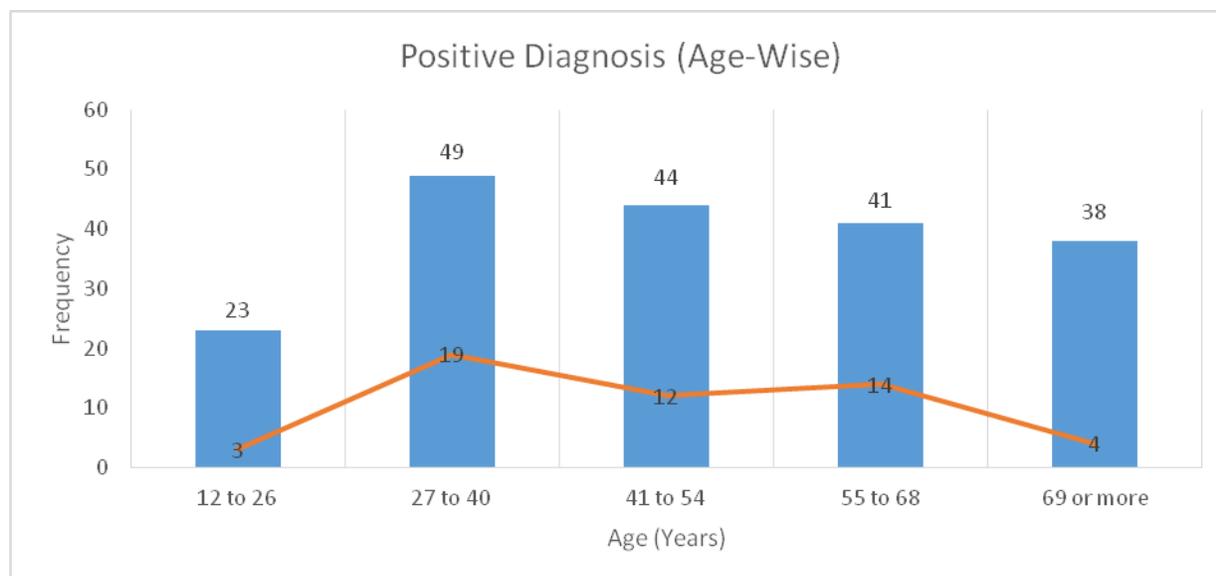
Among the study subjects, 60% of the sample comprised of males, while the remaining 40% were females.



The mean age of the study population was 39 years. The population was divided into 5 equal segments (most amounting to a 14 year gap). The graph below describes the age distribution.



Chest radiographs and sputum analysis revealed that 26% of the total subjects i.e. 52 patients were positive for non-asthmatic eosinophilic bronchitis. (p value < 0.05). An age related diagnostic break-up is also given below.



DISCUSSION:

Irwin and colleagues (11,12) suggested an anatomic-diagnostic approach for identifying the causes of chronic cough. Brightling and colleagues (6) modified this protocol to look for evidence of eosinophilic bronchitis and added the analysis of induced sputum to the other procedures. In this study, we used this modified protocol in patients with an isolated chronic cough lasting more than 8 weeks and identified the cause or causes of chronic cough in 108 (54%) patients. Eosinophilic bronchitis was the cause of chronic cough in 52 (26%) of them. Diagnosis of other patients was postnasal drip syndrome, gastroesophageal reflux disease, post-infectious cough and cough-variant asthma.

The patients testing positive for non-asthmatic eosinophilic bronchitis with sputum eosinophilia were given treatment with inhaled steroid. The clinical and laboratory findings of these patients were not different from others except for sputum eosinophil levels, which were much higher than the others. Carney (2) and Brightling (6) have shown that eosinophilic bronchitis is the cause of chronic cough in 10% and 13% of patients, respectively. In a recent study by Lee and colleagues, (19) 25 patients who had chronic non-productive cough as an isolated symptom and no other potential causes of chronic cough were evaluated. Instead of induced sputum, bronchoscopic biopsies were performed in order to assess the airway inflammation and 21 patients who had eosinophilic inflammation were defined as eosinophil-infiltrated group. Five of them were diagnosed as cough-variant asthma due to positive

results in the methacholine challenge test. The remaining 16 (64%) patients of the eosinophil

infiltrated group with no BHR were assessed as eosinophilic bronchitis and this rate was much higher than the previous studies.

A plausible explanation of this can be the recruitment of the patients who had idiopathic chronic cough only and exclusion of the ones with other causes of chronic cough. They also reported that four of 25 patients with chronic cough revealed higher median lymphocyte count than the healthy controls (median 84.5 vs. 22.0 cells/mm³ (3), respectively) and assessed these patients as lymphocyte-infiltrated subjects. In our study, we focused only on sputum eosinophils.

Fujimoto et al. (20) reported similar results and they found that the percentage of sputum lymphocytes was 6.7% in healthy subjects and 6.2% in asthmatic patients. Maybe, just like eosinophilic bronchitis, a new clinical condition can be described in patients with chronic cough, which will be called as “lymphocytic bronchitis” in the future.

CONCLUSION:

After careful consideration, the obtained results show that prevalence of eosinophilic (non-asthmatic) bronchitis, is marked among the study population. Routine sputum analysis is thus recommended for all patients presenting with chronic cough to help chronically un-diagnosed and overlooked eosinophilic bronchitis. Further research, if and when conducted, may show the exact prevalence, natural history and long-term prognosis of this disease.

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