

# Response to Metabolic activity of neutrophils is elevated in COPD

Sir,

We thank the author (s) of the letter dated 6<sup>th</sup> December 2015, responding to our published article—Increased metabolic activity of neutrophils in patients with chronic obstructive pulmonary disease (COPD)<sup>[1]</sup>—for their interest.

Here are our responses to their queries:

## ANSWER TO QUESTION 1

At the time we conducted this experiment, there were no published studies that had assessed the metabolic activity of neutrophils in Indian COPD patients by nitro blue tetrazolium test. Furthermore, our article was already accepted for publication by Lung India before the said article by Shanmugam *et al.*<sup>[2]</sup> was published.

## ANSWER TO QUESTION 2

We have followed a standardized protocol for assessing activation of neutrophils by the nitro blue tetrazolium test. Kindly refer to the article published by Merzbach and Obedeanu outlining the procedure.<sup>[3]</sup>

## ANSWER TO QUESTION 3

As outlined in our article, patients diagnosed with COPD using the Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria, i.e., forced expiratory volume in 1 s (FEV<sub>1</sub>)/forced vital capacity (FVC) ratio of <70% in a patient with a post bronchodilator or FEV<sub>1</sub> of <80% of predicted value were selected for the study. We have included smokers as well as nonsmokers in the study sample as smoking is not a criteria used for the diagnosis of COPD. Kindly refer to the article by Vestbo *et al.* regarding the GOLD criteria for the diagnosis of COPD.<sup>[4]</sup>

In our study, we are studying the changes in the metabolic activity of neutrophils in patients diagnosed with COPD, regardless of whether they smoke or not, and how long they have allegedly been smoking. Smoking history is subjective, whereas the diagnosis of COPD is precise. As we have obtained statistically significant results, despite a varied smoking history, it, in fact, hints that this neutrophil activation is indicative of COPD pathology, rather than the effect of smoking in general.

## ANSWER TO QUESTION 4

The activated neutrophil percentage is higher in the stimulated group (with *Escherichia coli* endotoxin) than the unstimulated group as the *E. coli* endotoxin, being used as a standardization agent, is shown to increase neutrophil activation. Kindly refer to article by Merzbach and Obedeanu.<sup>[3]</sup>

We have compared our observations using the Student's *t*-test. As illustrated in our article, we have obtained statistically significant increases in the percentage of activated neutrophils in COPD patients compared to the control group ( $P < 0.001$ ).

In addition, according to the article by Riffo-Vasquez *et al.*, doxophylline inhibits lung inflammation induced by lipopolysaccharide in mice.<sup>[5]</sup> Therefore, theoretically doxophylline could probably decrease the percentage of activated neutrophils in COPD patients. However, despite the use of doxophylline in 33% of our COPD patients, we have obtained a significant increase in the percentage of activated neutrophils in COPD patients.

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## Conflicts of interest

There are no conflicts of interest.

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