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**Overuse Of Rescue Bronchodilators In Asthmatics In Real Life. Evidence For Impaired Spirometry And Uncontrolled Eosinophilic Airway Inflammation**

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**Abstract:**

**Introduction** Excessive use of short acting  $\beta_2$  agonists is associated with adverse health outcomes including death. SABAs provide a rapid bronchodilatation but cannot control airway inflammation and give a false feeling of security. This study explores the relationship between the patient reported overuse and the measurement of lung function and airway inflammation. **Methods** We conducted a cross-sectional retrospective study on 2169 asthmatics aged  $\geq 12$  years recruited from asthma clinic of CHU Liege between 2011 and 2023. None of the patients were receiving biologics at the time of the analysis. Overuse of rescue bronchodilators (SABA or SABA/SAMA) was defined by a score  $\geq 3$  to the item 6 of the ACQ. This group of patients was compared to the groups who either did not use (score 0) or reported moderate use of rescue bronchodilators (score 1-2). **Results** Overall 70% of patients were receiving at least ICS or ICS/LABA as maintenance while 27% were only treated by SABA or SABA/SAMA and 3% were on montelukast or OCS only. On the whole cohort, 277 patients were overusers (13%), 900 patients were moderate users (42%) and 989 patients were non users (45%) of SABA or a combination of SABA/SAMA. Overusers reported a greater rate of exacerbation in the previous 12 months as opposed to non users ( $p < 0.0001$ ) and moderate users ( $p < 0.001$ ). Overusers of rescue bronchodilating agents had greater smoking habit ( $p < 0.001$ ) and a higher BMI compared non users group ( $p < 0.05$ ). As for lung function parameters, overusers were associated with lower % predicted FEV1, % FEV1/FVC ( $p < 0.0001$  for both) and PC20 M ( $p < 0.01$ ) compared to non users. Furthermore, overusers had greater sputum eosinophil counts compared to non users ( $p < 0.0001$ ) but not greater neutrophil counts nor with greater FeNO levels. Sputum eosinophil  $\geq 3\%$  was observed in 51% of overusers, 39% in the moderate users and 35% in the non users. **Conclusion** Overuse of rescue bronchodilating agents is observed in a bit more than 10% of asthmatics in a real life setting is associated with smoking, obesity, lower airway calibre and greater airway eosinophilic inflammation. This study shows that there is a demographic, physiological and pathological ground underlying rescue bronchodilating agents overuse in real life and it points to the need for hygienic measures together with improved pharmacological strategy.

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