

慢性氣喘病人在運動(exercise)誘發性或醯丑甲基
膽鹼 (methacholine) 誘發性氣道收縮下，有不
同的氣道過度反應機制

**Different mechanisms of airway
hyperresponsiveness between different
mechanisms of airway
hyperresponsiveness between exercise
and methacholine-induced
bronchoconstriction in chronic asthma.**

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摘要

此次研究目的主要是探索慢性氣喘病人，在運動及醯丑甲基膽鹼 (methacholine) 誘發性氣道收縮下，有不同的氣道過度反應機制。選取 41個慢性氣喘病人接受運動誘發性氣道收縮，及膽鹼誘發性氣道收縮測試。在測試前及測試後0、5、10、15、30、45、60、75 分鐘內，我們記錄用力吐氣第一秒量 (FEV1)；並計算其在六十分鐘內，用力吐氣第一秒量之減少量百分比與時間曲線下的面積 (AUC 0-60 min)，以及計算由最低用力吐氣第一秒量 (maximum FEV1 decrease) 開始，到回復95% 用力吐氣第一秒量基準量所需要的時間 (Recovery time)。在41個受試者中，有12個有運動誘發性氣道收縮，29個沒有運動誘發性氣道收縮。結果發現，有運動誘發性氣道收縮的受試者，其AUC 0-60 min以及recovery time皆比沒有運動誘發性氣道收縮的受試者來的高 (1201.0 ± 70.0, n=12 versus 328.0 ± 28.0 %·min, n=29, p<0.0001; 109.2 ± 26.5, n=11 versus 36.9 ± 5.9 min, n=28, p<0.0001)。這兩群 [EIB (+) and EIB (-)] 在接受膽鹼誘發性氣道收縮測試後，AUC 0-60 min以及recovery time皆無顯著差別 (1136.0 ± 115.8 versus 1121.0 ± 122.7 %·min, p= 0.936; 111.5 ± 14.2 versus 106.0 ± 14.3 min, p=0.757)。此外，比較運動誘發

性或醯丑甲基膽鹼誘發性氣道收縮AUC 0-60 min，發現並無明顯的正相關（ $r=0.24$ ）。因此，藉由比較運動或醯丑甲基膽鹼誘發性氣道收縮後，兩者用力吐氣第一秒量之減少量百分比與氣道擴張回復時間的差異性，推測兩者應該有不同的氣道過度反應機制。

Abstract

Purpose: The aim of this study was to explore the different mechanisms of exercise-(EIB) and methacholine-(MIB) induced bronchoconstriction in patients with chronic asthma. **Methods:** We measured the FEV1, recovery time (RT), and AUC 0-60 min (area under the curve from 0 to 60 min after exercise in FEV1) in 41 asthmatics, who received exercise and methacholine challenge tests. **Results:** Among these asthmatics, 12 asthmatics had EIB and 29 had no EIB. The recovery time was prolonged (109.2 ± 26.5 min, $n=11$, $p<0.001$) and AUC 0-60 min was larger ($1201.0 \pm 70.0\% \cdot \text{min}$, $p<0.0001$) in the EIB group, compared to the non-EIB group (RT : 36.9 ± 5.9 min; AUC : $328.0 \pm 28.0\% \cdot \text{min}$, respectively, $n=28$). There was no difference in AUC and RT after methacholine-induced bronchoconstriction between the EIB and non-EIB groups (1136.0 ± 115.8 versus $1121.0 \pm 122.7\% \cdot \text{min}$, $p=0.936$; 111.5 ± 14.2 versus 106.0 ± 14.3 min, $p=0.757$). There was no significant correlation between the magnitude of AUC induced by exercise test or methacholine challenge ($r=0.24$) **Conclusion:** We suggested that there were different mechanisms between EIB and MIB. The delayed bronchodilation in the EIB asthmatic subjects was probably related to presence of bronchoconstrictors.