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**Title:** Effect of bariatric surgery on asthma: 3 months follow-up

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**Body:** Background: Asthma in obese subjects is poorly understood and the effect of weight loss on asthma control is not well described. Aim: To investigate the effects of bariatric surgery on asthma control, quality of life and lung function. Methods: We performed a prospective study in patients with confirmed diagnosis asthma ( $\Delta FEV_1 \geq 12\%$  or  $PD20 < 1.76\text{mg}$  (=BHR)) and non asthmatic patients undergoing bariatric surgery (BMI  $> 35\text{kg/m}^2$ , age 18-50y). Lung function, medication and quality of life were assessed at baseline and 3 months after bariatric surgery. Obese asthmatics who did not undergo bariatric surgery served as an additional control group. Results: 35 asthma patients(O+A) and 50 non-asthmatics(O-A) underwent bariatric surgery, 17 asthma patients served as controls(NO+A). There were no differences in ACQ, AQLQ, FEV<sub>1</sub> or FeNO between O+A and NO+A at baseline. BMI of NO+A( $40\text{kg/m}^2$ ) was significantly lower than O+A( $47\text{kg/m}^2$ ). After bariatric surgery, BMI decreased to  $38\text{kg/m}^2$  in O+A, and BHR decreased significantly in O+A(80% to 34%,  $p=0.003$ ). In addition, use of ICS decreased with 50%. FEV<sub>1</sub> improved significantly only in O+A(mean 85.6 to 94.6%pred,  $p=0.011$ ). Following surgery, ACQ and AQLQ significantly improved in O+A group(1.1 to 0.5,  $p=0.022$ ; resp. 5.7 to 6.3  $p=0.004$ ), whereas no change was detectable after 3 months in NO+A. ACQ and AQLQ were significantly better in O+A group compared to NO+A after 3 months(ACQ  $p=0.027$ , AQLQ  $p=0.002$ ). No change in FeNO in any group. Conclusion: Bariatric surgery improves lung function, asthma control and quality of life in patients with asthma and morbid obesity already after 3 months. So it can be speculated that weight loss is an important component of the management of obese asthmatics.