BARIATRIC SURGERY FOR ADULTS WITH OBESITY-RELATED ASTHMA

Mitsuhiro Sumitani, Seiichi Kitahama, Yoshimi Takeshima, Misaki Jusho, Yu Matsuo, Ayu Okumura, Shinsuke Nakajima

Chibune General Hospital, Department of Respiratory Medicine and Center for Obesity, Diabetes and Endocrinology

DISCLOSURE :

No conflict of interest

Background

- We acknowledge the report that obesity is one of the important factors affecting the pathogenesis of bronchial asthma.
- Various associations have been suggested between obesity and bronchial asthma, including pulmonary function and airway inflammation.
- Report of weight loss of 10% or more leading to improved asthma control in obesity-related bronchial asthma are recognized.
- However, since weight loss interventions are very difficult in severe obesity patients who are unable to exercise, bariatric surgery may be a treatment option for patients with obesity-related asthma.

Objective

- **We evaluate the impact of weight loss and Bariatric Surgery on bronchial asthma control in patients with obesity-related asthma.**

Research Design

- **Retrospective study**

- **Study Methods.**
- **From June 2018 to December 2023, 103 patients underwent first Bariatric Surgery for severe obesity. Among patients who checked a history of bronchial asthma on the preoperative questionnaire sheet, 15 patients who continue to treat for bronchial asthma at the time of surgery were evaluated for preoperative and postoperative bronchial asthma control.**

- **Clinical Research IRB Approval Number: Chibune Hospital 20240329A**

Subject

Screening

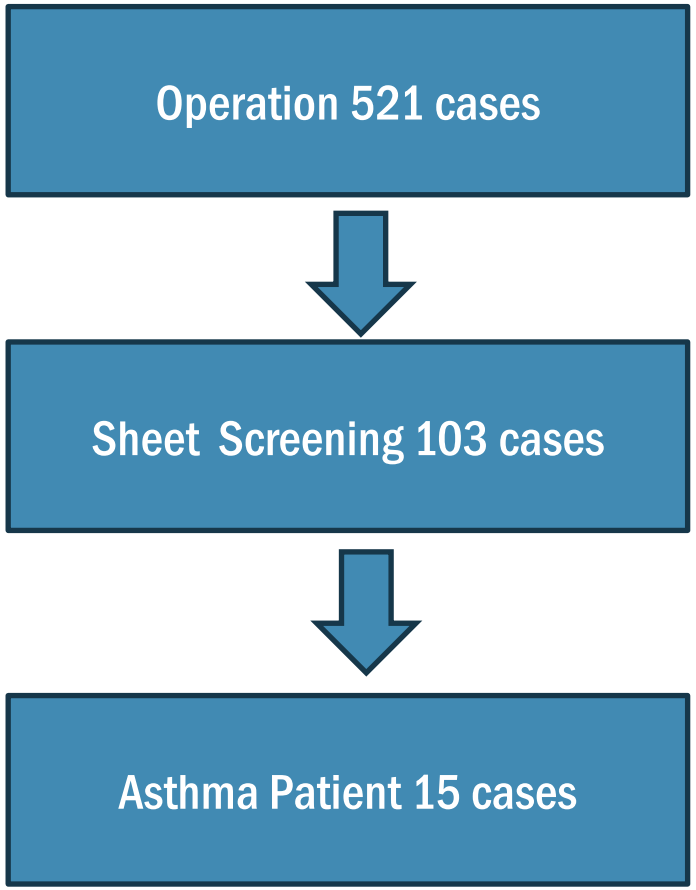
Patients scheduled for bariatric surgery for severe obesity and who report a history of asthma on the preoperative questionnaire sheet

Selection criteria

- 18 years of age or older
- Ongoing treatment for bronchial asthma at the time of surgery
- First bariatric surgery

Exclusion criteria

- patients with pacemakers
- smokers with a Brinkmann INDEX of 600 or more
- Severe psychiatric disorders
- Obesity due to endocrine disease or drugs (secondary obesity)



Evaluation Points

Primary End points

- **Pre-operative and Post-operative change in ACT (asthma control test : 5-25 points) score**
  - **☆MID(Minimally Important Difference): An increase of 3 or more points on the ACT is rated as an improvement.**

Secondary endpoints

- **Pre- and Post-operative change in FEV1**
- **Relationship between %TWL, %EWL and ACT score improvement**

Patient Background (N=15)

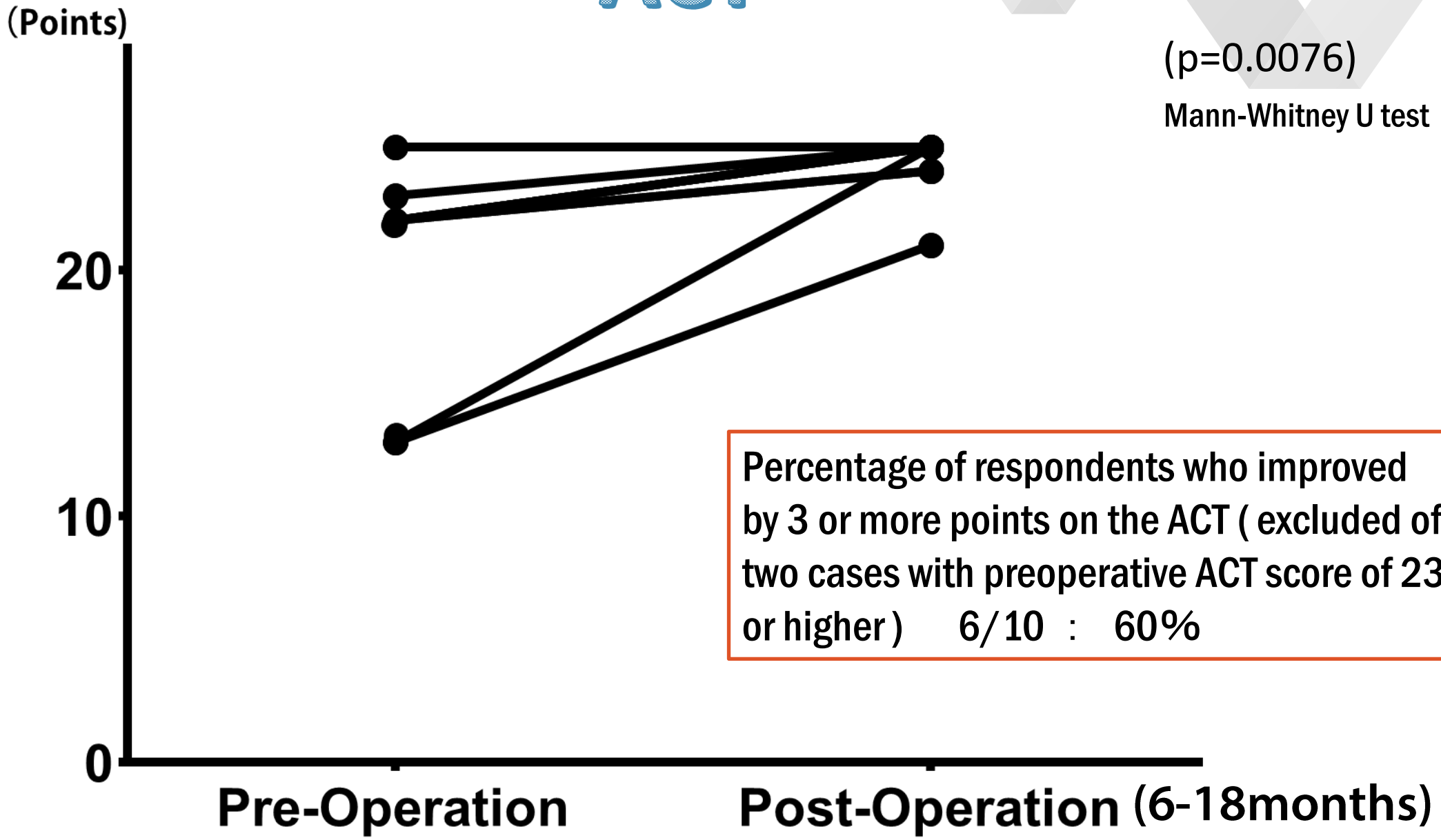
Age (median: IQR): years	46 (39.5-53.5)
Gender (male/female)	2/13
BMI (median: IQR): kg/m2	41 (36.5-52.1)
Visceral fat percentage (median: IQR) :cm2	29.6 (26.8-34.9)
Leptin (median: IQR) :ng/ml	41.5 (18.2-57.7)
Adiponectin (median: IQR):μg/ml	4.3 (2.6-5.3)
Insulin:μU/ml	14.9 (9.1-20.7)
HbA1c (median: IQR) :%	6 (5.75-6.8)
ABCD Score: points	5 (3.5-6.5)
Complicated condition	DM:7, HL:8, HTN:8, SAS: 11
% EWL [6 months] (median: IQR) :%	57.9 (41.6-70.7)
% TWL [6 months] (median: IQR) :%	20.3 (17-26.7)
Surgical Procedure (Sleeve/Sleeve Bypass)	14/1

History of smoking	Non-smoker :10, Ex-Smoke:5
Asthma Control Test (ACT) score (median: IQR) : points	22 (19.8-22.3)
Type of phenotype on asthma	Type2:8, Non-Type2:5, unknown:2
IgE (median: IQR) :IU/ml	36.1 (31.7-247)
WBC count (median: IQR): /μl	7200 (5750-10150)
Eosinophil count (median: IQR) : /μl	151.5 (116.4-310.1)
% FVC (median: IQR) : %	104.5 (99.8-119.0)
FEV1 (median: IQR) : L	2.8 (2.38-3.1)
FEV1/FVC (median: IQR) : %	81.5 (78.6-84.6)
Date of postoperative asthma evaluation (median: IQR) :months	12 (9-16.5)
Epworth Sleep Scale (ESS) - J (median: IQR): points	11 (3-15)
AHI/REI (Median: IQR): /hr	35.6 (30.5-79.6)/31.7 (11.2-43.8)
3% ODI (PSG)/3% ODI (Type3) (median: IQR): /hr	45.6 (13.8-52.6)/27.4 (21.1-66.9)
SAS Intervention	CPAP: 10, no treatment: 5

Type 2 asthma is an endotype of asthma characterised by an inflammatory process involving eosinophilic infiltration and IgE sensitisation.

Results

ACT (n=10)



(p=0.0076)

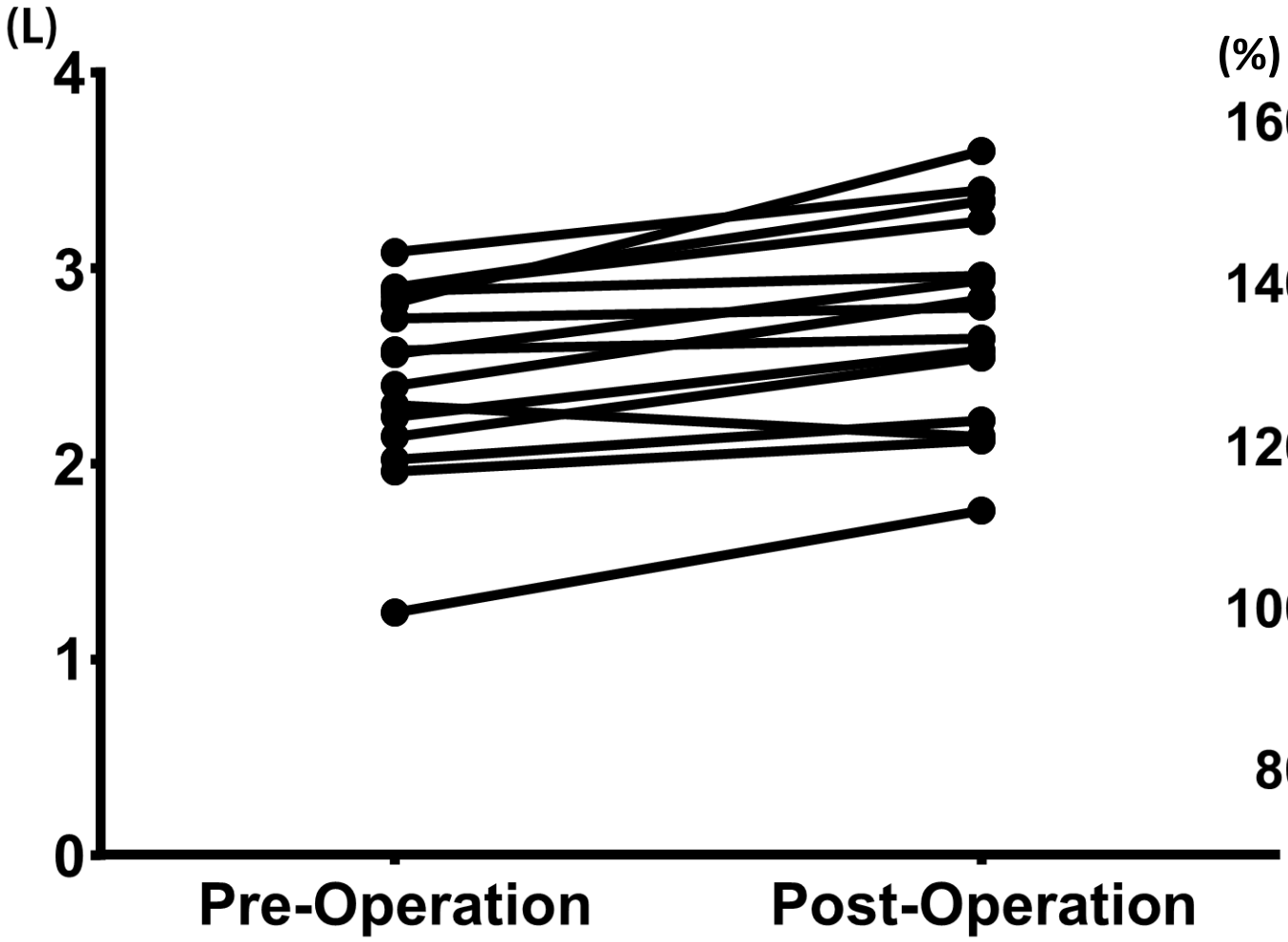
Mann-Whitney U test

Percentage of respondents who improved by 3 or more points on the ACT (excluded of two cases with preoperative ACT score of 23 or higher) 6/10 : 60%

(n=15)

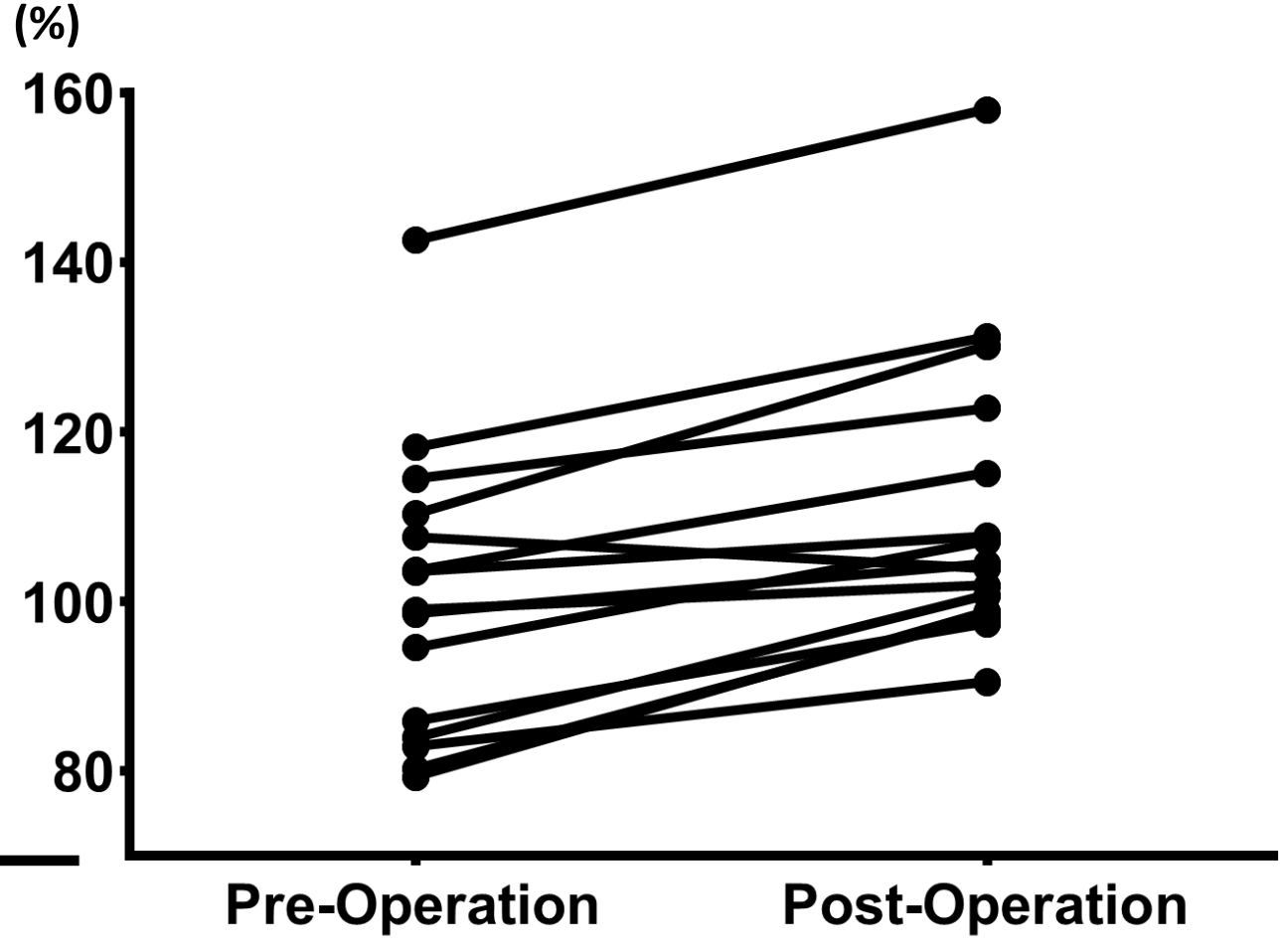
FEV1

(p=0.0001)
Mann-Whitney U test

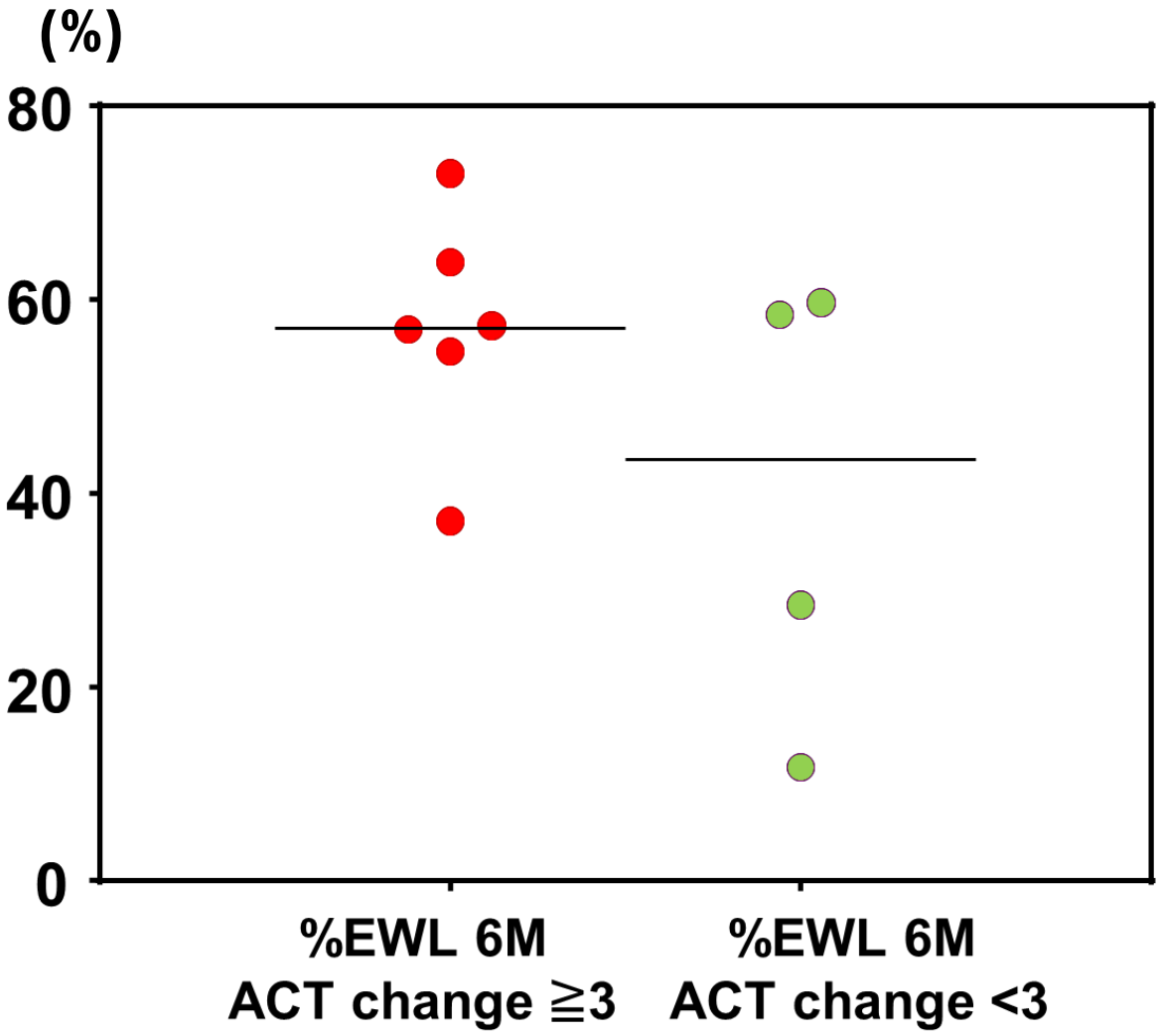


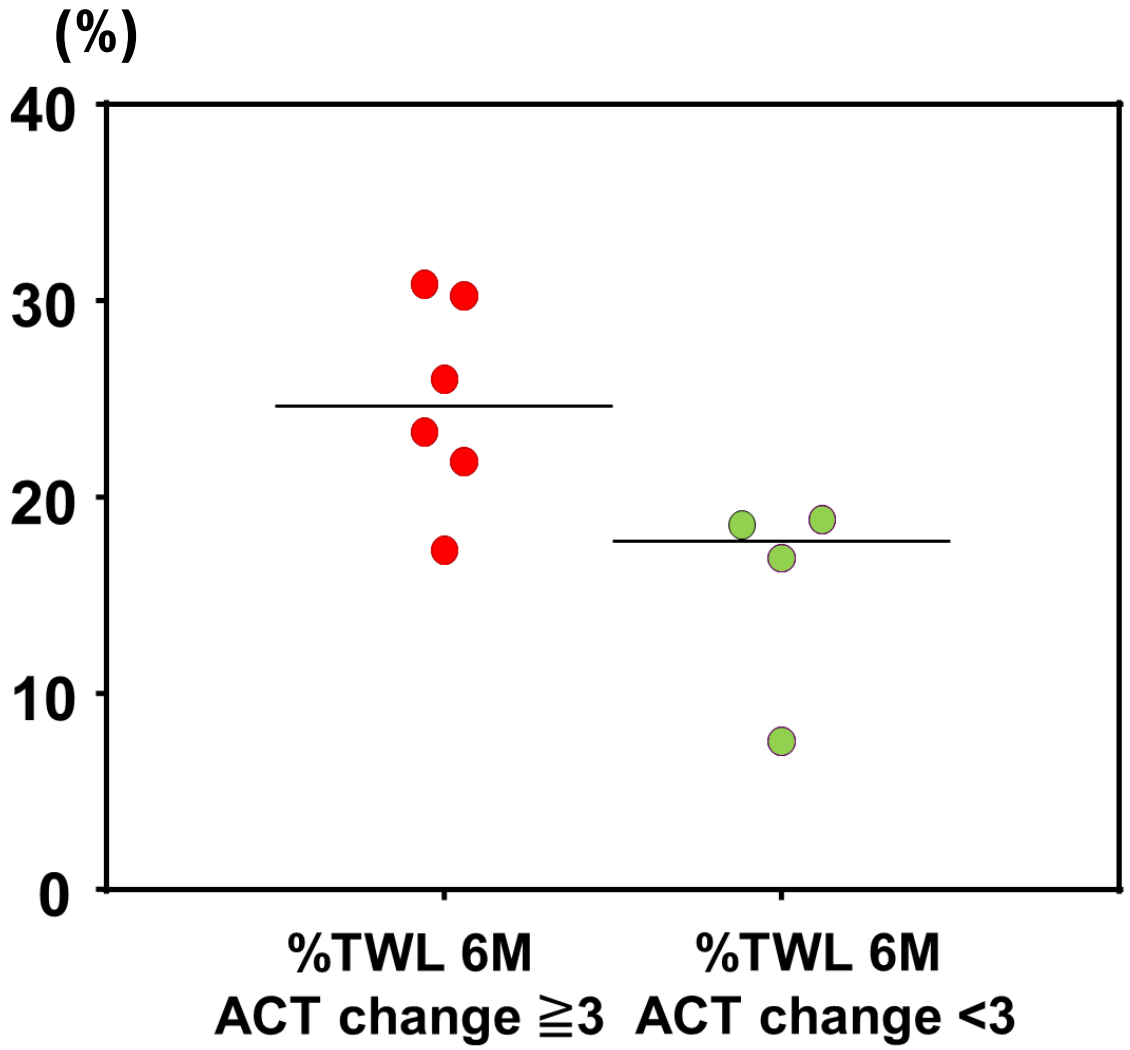
%FVC

(p=0.1351)
Mann-Whitney U test



Relationship between %TWL, %EWL and ACT score improvement





Discussion

- Obesity is a risk factor for asthma, but obesity-associated asthmatics respond less well to standard asthma medications and are less effective with steroids than non-obese asthmatics.
（AJRCCM 2008;178:682-687）

- Weight loss of 10% or more improves bronchial asthma control in patients with obesity-related asthma.
(Eur Respir J 2014; 43: 1368–1377)

- Systemic inflammation caused by obesity reduces the effectiveness of steroids by inhibiting corticosteroid signaling.

Discussion 2

- The weight loss effect of Laparoscopic adjustable gastric banding (LAGB) for severe obesity complicated with asthma improved bronchial asthma control at 1 year postoperatively, and the effect lasted for 5 years. （Respir Med 2017;130:69-74)

- Increased FVC, FEV1, FRC, and TRC at 12 months after Bariatric Surgery, but only improvement in FEV1 was seen in severely obese patients with asthma.
（AJRCCM 2014；189（12）,1494-1502)

- Bariatric surgery increases circulating bile acids, and these bile acids mediate decreased feeding, subsequent weight loss, and improved glucose tolerance, and bile acids also have anti-inflammatory effects that may be related to asthma.
（Int J Obes 2015；39：1565-1574）
（Int Arch Allergy Immunol 2014；165：1-8）

Conclusion

- Therapeutic intervention through bariatric surgery for obesity-related asthma appears to result in improved control of bronchial asthma.