

DECREASE IN ARTERIAL STIFFNESS IN MORBIDLY OBESE PATIENTS AFTER BARIATRIC SURGERY. RELATIONSHIP WITH OBSTRUCTIVE SLEEP APNOEA, ANTHROPOMETRIC PARAMETERS AND LOW-GRADE INFLAMMATION.

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INTRODUCTION AND OBJECTIVES

- Morbidly obesity (MO) and OSA (obstructive sleep apnoea) are both associated with increased arterial stiffness (AS) and low grade inflammation (LGI) ^{1,2,3,4}.
- Objective: to study the effect of bariatric surgery (BS) on AS and LGI in patients with MO and OSA and its relationship.

METHODS

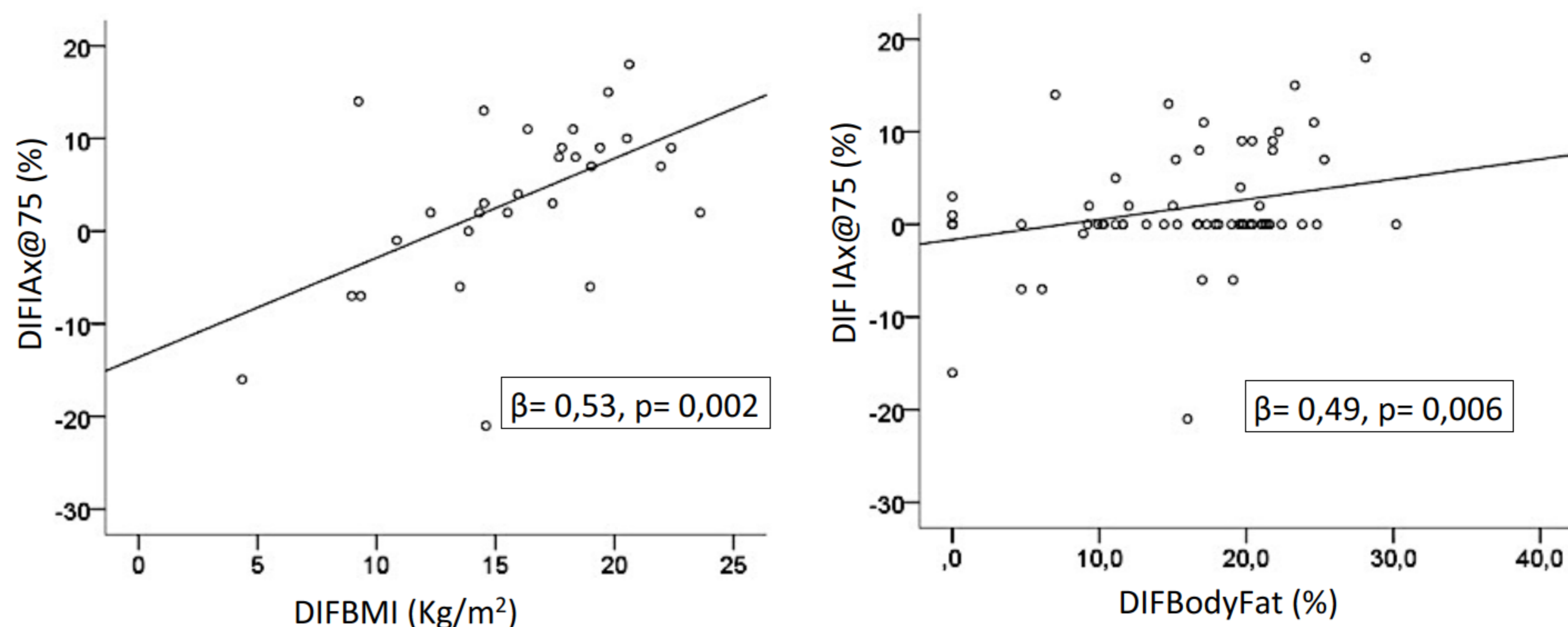
- Thirty MO patients with OSA, without Continuous Positive Airway Pressure (CPAP) treatment, were evaluated before and one year after surgery.
- All patients underwent overnight conventional polysomnography (CE-Series Compumedics, Victoria, Australia).
- To assess AS, augmentation index adjusted for heart rate (IAx@75) was obtained by applanation tonometry (Sphygmocor® versión 7.0 AtCor Medical, Sidney, Australia).
- To assess LGI, TNF α , IL-6, IL-1 β , PCR and adiponectin levels were measured (*Milliplex Catalog, Merck Millipore, Madrid*).
- Average blood pressure (ABP), BMI and % body fat (% BF) by bioelectrical impedance (TANITA) were also measured.
- For statistical analysis SPSS version 19 was used.

RESULTS

- We studied 2 male and 28 female, 41,6 \pm 9,2 years old. Eleven (37%) had mild OSA, 7 (23%) moderate and 12 (40%) severe. Twenty-six underwent Roux-en-Y gastric bypass and 4 sleeve gastrectomy, according to the local protocol. Excess weight loss was 67,2 \pm 13,5 %.
- AS, ABP and LGI decreased after BS, and adiponectin increased. IAx@75 decline (DIFIAX@75) correlated with body mass index and body fat percentage improvement (DIFBMI and DIFBodyfat, respectively) but not with LGI improvement. IAx@75 decline was predicted by Apnoea Hypopnoea index (AHI) and % BF, before surgery.

Parameters	BS	AS
Hypertension	14 (47%)	7 (23%) ^o
Type 2 Diabetes	8 (27%)	2 (7%)
Dilispemy	7 (23%)	2 (7%)
Smoker	11 (37%)	11 (37%)
Former smoker	9 (30%)	9 (30%)
BMI (Kg/m ²)	44,8 \pm 4,79	29,0 \pm 3,13*
Body fat (%)	50,6 \pm 3,83	33,8 \pm 7,06*
Average blood pressure	102,3 \pm 9,02	95,1 \pm 8,97*
IAx@75 (%)	22,6 \pm 11,5	19,0 \pm 12,8*
TNF- α (pg/mL)	3,07 \pm 1,89	2,47 \pm 1,30*
IL-6 (pg/mL)	0,64 \pm 0,87	0,45 \pm 0,76*
IL-1 β (pg/mL)	0,51 \pm 0,58	0,39 \pm 0,42
PCR (mg/dL)	2,09 \pm 5,60	0,12 \pm 0,09
Adiponectin (μ g/mL)	15,3 \pm 8,83	30,4 \pm 14,6 ^o
AHI (events/h)	29,2 \pm 19,5	8,17 \pm 10,48 ^o
CT90 (%)	6,60 \pm 11,31	1,21 \pm 4,11*
Arousal index (events/h)	20,0 \pm 16,9	14,1 \pm 8,44*

CT90: time percentage with SpO₂ <90%. Data are mean \pm ED. ^op < 0,05, *p < 0.01, #p < 0,001, vs before surgery (BS).



Predictive model for AIX@75 decline after surgery

Dependent parameters	Beta	Error standar	p
Age (years)	-0,18	0,17	0,3
Average blood pressure (mmHg)	0,28	0,17	0,12
Body fat (%)	0,49	0,32	0,01
AHI (events/h)	-0,45	0,10	0,04

R²: 0,50.

CONCLUSION

In patients with MO and OSA, the less OSA severity and the more %BF before surgery, the more AS improvement achieved after BS.

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