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

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INTRODUCTION AND OBJECTIVES

- Morbidity 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, TNFα, IL-6, IL-1β, 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 ± 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 ± 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 (AIH) and % BF, before surgery.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>BS</th>
<th>AS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>14 (47%)</td>
<td>7 (23%)</td>
</tr>
<tr>
<td>Type 2 Diabetes</td>
<td>8 (27%)</td>
<td>2 (7%)</td>
</tr>
<tr>
<td>Dilisprene</td>
<td>7 (23%)</td>
<td>2 (7%)</td>
</tr>
<tr>
<td>Smoker</td>
<td>11 (37%)</td>
<td>11 (37%)</td>
</tr>
<tr>
<td>Former smoker</td>
<td>9 (30%)</td>
<td>9 (30%)</td>
</tr>
</tbody>
</table>
| BMI (kg/m²)                 | 44.8 ± 4.79 | 29.0 ± 3.13*
| Body fat (%)                | 50.6 ± 3.83 | 33.8 ± 7.06*
| Average blood pressure      | 102.3 ± 9.02 | 95.1 ± 8.97*
| IAx@75 (%)                  | 22.6 ± 11.5 | 19.0 ± 12.8*
| TNF-α (pg/mL)               | 3.07 ± 1.89 | 2.47 ± 1.30*
| IL-6 (pg/mL)                | 0.64 ± 0.87 | 0.45 ± 0.76*
| IL-1β (pg/mL)               | 0.51 ± 0.58 | 0.39 ± 0.42
| PCR (mg/dL)                 | 2.09 ± 5.60 | 0.12 ± 0.09
| Adiponectin (µg/mL)         | 15.3 ± 8.83 | 30.4 ± 14.6*
| AIH (events/h)              | 29.2 ± 19.5 | 8.17 ± 10.48*
| C90 (%)                     | 6.60 ± 11.31 | 1.21 ± 4.11*
| Arousal index (events/h)    | 20.0 ± 16.9 | 14.1 ± 8.44*

CT90: time percentage with SpO2(2)<90%. Data are mean ± ED. *p < 0.05, *p < 0.01, *p < 0.001, vs before surgery (BS).

Predictive model for IAx@75 decline after surgery

<table>
<thead>
<tr>
<th>Dependent parameters</th>
<th>Beta</th>
<th>Error standar</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>-0.18</td>
<td>0.17</td>
<td>0.3</td>
</tr>
<tr>
<td>Average blood pressure (mmHg)</td>
<td>0.28</td>
<td>0.17</td>
<td>0.12</td>
</tr>
<tr>
<td>Body fat (%)</td>
<td>0.49</td>
<td>0.32</td>
<td>0.01</td>
</tr>
<tr>
<td>AIH (events/h)</td>
<td>-0.45</td>
<td>0.10</td>
<td>0.04</td>
</tr>
</tbody>
</table>

C2= 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.

BIBLIOGRAPHY


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