BODY MASS INDEX AND SPERM QUALITY: effects of overweight and underweight.

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We previously reported a negative association between body mass index (BMI) and sperm motility and seminal alpha-glucosidase concentration (NAG), suggesting that epididymis may be a target organ for weight-linked alterations. In this study, we analyzed a possible association between BMI and semen quality in 4876 patients with no genitourinary diseases or toxin exposure, including morbidly-obese and underweight patients. We performed multivariate regression analysis using BMI, age and abstinence as independent variables and demonstrated that BMI was inversely and significantly associated with semen volume, total sperm count, motility and NAG (slopes: -0.01, -1.33, -0.18, -0.75; $p<0.05$); in addition, we found a significant negative association between BMI and viability, morphology and HOST.

Furthermore, we randomly selected a similar group of patients and evaluated the seminal characteristics of underweight (UW=BMI<20, n=45), normal (N=20≤BMI<25, n=50), overweight (OW=25≤BMI<30, n=50), obese (O=30≤BMI<40, n=50) and morbidly-obese (MO=BMI>40, n=57) patients, performing MANCOVA test with age and abstinence as co-variables. We found that not only MO, but also UW patients had spermogram impairments, reaching statistical significance in sperm concentration (UW=42.7±6.0, N=54.7±5.5, OW=59.1±7.5, O=54.4±6.1 and MO=37.9±4.9; $p<0.05$ OW and O vs UW and MO; $p<0.05$ N vs MO) and total sperm count (UW=103.3±11.4,

N=161.3±19.0, OW=166.5±20.0, O=149.1±17.2 and MO=121.5±20.6; $p<0.05$ N, OW and O vs UW; $p<0.05$ OW vs MO).

In conclusion, although the increase of BMI is negatively associated with semen quality, underweight also constitutes a risk factor for infertility. Since sperm density, motility and NAG are markers of the epididymal function, these new results support our original hypothesis.