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Title (type in CAPITAL LETTERS, leave one blank line before the text)	
<u>ABDOMINAL PRESSURE, OBESITY and INCONTINENCE in WOMEN</u>	
<p><u>AIMS of STUDY</u> - Obesity is an independent risk factor for female incontinence in epidemiological studies¹, and has also been implicated in the failure of anti-incontinence surgery². It is thought to be a factor in the pathogenesis of genuine stress incontinence (GSI) in women, although the mechanism is debated. The increased rate of incontinence may be related to higher abdominal pressure (p abd) in obese women³.</p> <p>Surprisingly few data are available on the precise relationship between obesity and p.abd in women. In morbidly obese patients p abd correlates well with indices of obesity, particularly with the sagittal abdominal diameter (SAD)^{4,5}, which is the best predictor of the volume of intra-abdominal adipose tissue⁶. The increment in abdominal pressure on coughing also appears to be related to obesity, with a significantly smaller increment after massive weight loss in morbidly obese women⁵. It has been shown that stress incontinent women have a greater increment in intravesical pressure on coughing compared to controls, which was considered important in determining the severity of incontinence, although the relationship to obesity was not studied⁷. We therefore investigated in detail the relationship between obesity and static and dynamic abdominal pressures in a large group of women of more normal weight.</p> <p><u>METHODS</u> – Women referred for UDS were recruited, height and weight measured, and the indices height/weight and height/weight² (i.e. body mass index, or BMI) calculated. The SAD - i.e. the midline anteroposterior diameter of the abdomen - was measured at maximal expiration at the umbilicus with the patient supine. P.abd was measured before UDS in supine, sitting and standing positions using external transducers, according to ICS guidelines. A subgroup of patients were studied for the pressure increment during dynamic manoeuvres, recorded at a standard bladder volume of 100 ml. Patients were asked to perform 3 maximal strength coughs, and then to exhale against different resistances to produce a graded series of Valsalva manoeuvres.</p> <p><u>RESULTS</u> - 99 women were studied. Weight, BMI and particularly SAD correlated well with p abd ($p < 0.01$ for all correlations). Correlation coefficients for BMI and SAD in different postures were</p>	

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	Supine p abd	Sitting p.abd	Standing p.abd
BMI (n = 99)	0.59	0.67	0.73
SAD (n = 90)	0.62	0.69	0.79

The correlation between indices of obesity and p abd increased as the patient moved from lying to sitting to standing position. Correlation also increased successively with different indices of obesity in the order: weight < weight/height \cong BMI < SAD. Comparing women of normal weight (BMI 20-25, n = 26) with overweight women (BMI 25-30, n = 39), and women with mild obesity (BMI 30-35, n = 18), the mean resting abdominal pressures were 28.9, 32.8 and 40.8 cmH₂O respectively.

The last 29 recruits were studied in more detail. They were divided into 2 groups according to BMI: group 1. BMI < 28, n = 15; and group 2. BMI \geq 28, n = 14. The mean maximum increment in pressure on coughing was higher in the more obese women (Group 2: 15.2 cmH₂O, Group 1: 12.7 cmH₂O), but this difference was not statistically significant. There was no difference in mean pressure increment during maximum valsalva between the groups (Group 1: 29.4 cmH₂O, group 2: 28.0 cmH₂O).

CONCLUSIONS - Obesity shows a strong correlation with intra-abdominal pressures. As would be predicted, the highest correlation is with SAD, and thus with intra-abdominal obesity. There was a trend towards greater pressure increment on coughing in more obese women, although this was not statistically significant (possibly due to the small sample size). GSI in obese women may be partly related to the fact that the resting abdominal pressure is elevated, and thus lies closer to the abdominal leak point pressure for the individual. This study also suggests that the abdominal leak point pressure may be more easily reached in obese women due to higher pressure increments on coughing, although this requires further study.

REFERENCES –

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