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Anorectal Manometry Parameters in a Fecal Incontinence Cohort Related to Body Mass Index

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BACKGROUND

- Fecal Incontinence (FI) is defined as an involuntary loss of stool which affects 2% to 25% of the U.S. population
- With the increasing obesity epidemic, an association between FI and obesity has been demonstrated
- This may stem from the following:
 - obesity increases intra-abdominal pressure and stresses the pelvic floor.
 - The chronic state of increased pressure may then cause damage to the pelvic floor musculature.

AIM

- Assess differences in anorectal parameters for a U.S. FI cohort in relation to body mass index (BMI)

METHODS

- Retrospective chart review of anorectal manometry (ARM) studies performed at the University of Michigan between 2001 – 2011
- 690 Patients underwent ARM for FI
- 369 Patients had recorded BMI information
- 99% of the ARMs were performed and interpreted by the same individuals
- Statistical analysis:
 - T-tests and Analysis of Variance to assess differences among ARM and BMI as continuous and categorical variables
 - Linear regression and multiple linear regression models used
 - P-values <0.05 were considered statistically significant

RESULTS

<u>Subject Demographics</u>		
<u>Items</u>	<u>Mean/Percentage</u>	<u>Standard Deviation</u>
Age	59	14.6
Body Mass Index (BMI)	28.8	6.9
Gender	Female (81.8%)	
Race	Caucasian (88.3%)	

<u>Anorectal Manometry Parameters Associated with Body Mass Index</u>	<u>BMI = < 24.99 (n = 123)</u>	<u>BMI = 25 – 29.99 (n = 116)</u>	<u>BMI = 30 – 34.99 (n = 67)</u>	<u>BMI = > 35 (n = 63)</u>
<u>PARAMETERS</u>				
Average Age	57.8	60.57	60.76	58.92
Mean Resting Pressure (mmHg)	51.95	61.15	49.85	64.42
Mean Squeeze Pressure (mmHg)	100.29	112.65	95.37	104.78
Threshold Sensation (ml)	54.13	48.10	47.50	60.33
Urge Sensation (ml)	98.49	88.24	94.28	99.13
Max Tolerated Sensation (ml)	143.19	139.53	141.33	150.89
Average BMI	22.03	27.37	32.40	40.51

<u>Mean Resting Pressure (mmHg) Related to Body Mass Index</u>	<u>Sample Size</u>	<u>Mean Resting Pressure</u>
< 24.9	120	51.95
25 – 29.9	115	61.15
30 – 34.99	67	49.85 (p = 0.0081)
> 35.0	61	64.42

Summary

- Patients in the BMI category 30 – 34.99 had a lower mean resting pressure (mmHg) compared to the other three BMI categories. (p=0.0081)
- Besides mean resting pressures (mmHg), no other anorectal parameters, pressures or sensations, were statistically significant amongst BMI categories
- BMI was the only significant variable associated with increased resting pressure (mmHg) after adjusting for sex, age, and race
- Both female sex and increasing age were significantly associated with decreased resting pressure (mmHg)

Conclusions

- Obesity, female gender, and age affects mean resting pressure in patients with FI
- No other patient characteristics were found to impact other anorectal parameters including maximum squeeze pressure (mmHg) or rectal sensations.
- Further evaluation of anorectal parameters are needed to confirm the association between BMI and FI