Male Body Mass Index (BMI) Influence on Male Fertility Outcomes

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Background

Obesity, classically defined as body mass index (BMI, measured as kg/m^2) of 30 or higher, is associated with a myriad of health issues and is rampantly becoming an epidemic in the United States. In fact, there are conflicting results regarding the relationship between male BMI and reproductive potential. As it relates to infertility, male factor has been linked with approximately 20-30% of cases.[1] Though poorly understood, proposed influential markers impacting male fertility through elevated BMI include: testicular steroidogenesis disruption, hypothalamic-pituitary-gonadal axis disturbances, and metabolic dysregulation[2]. Few studies have identified either negative or no association between elevated male BMI and assisted reproductive technology outcomes and resultant sperm parameters; however, many of these associations did not reach clinical or statistical significance[1,2]. There lacks recent, expansive studies, specifically focused on the United States male population, analyzing elevated male BMI and qualitative fertility outcomes.

Objective

We aim to expand present knowledge between male BMI and qualitive fertility outcomes nationally.

Materials and Methods

The National Survey of Family Growth (NSFG) data was utilized for 5,602 nationally representative men aged 15-49 in the United States who were interviewed from 2017-2019. BMI was categorized as per standard cutoffs: underweight less than 18.5, healthy weight between 18.5-24.9, overweight between 25-29.9, and obese greater than 30. Infertility outcomes were categorized as: seeking infertility testing, low sperm count, ever having impregnated someone, and physical ability to father a child. Confounders included: age, ever having vaginal sex, ever cohabiting with a sexual partner, and frequency of contraception use with three most recent sexual partners. Chi-squared tests compared BMI to the aforementioned infertility outcomes. A univariate logistic regression quantified the significant associations, followed by a multivariate logistic regression adjusting for confounders.

Table1. BMI characteristics for study population

BMI	% of subjects (n)
<18.5	1.4% (56)
18.6-24.9	28.6% (1177)
25-29.9	37.8% (1553)
>30.0	32.2% (1325)

Table 2. Association between qualitative fertility outcomes and BMI

	χ2 p-value
Seeking infertility testing	0.68
Low sperm count	0.17
Physical ability to father a child	0.52
Every having impregnated someone	<0.01

Table 3. Crude and adjusted association between BMI and ever impregnating someone

	COR	95% CI	P	AOR	95% CI	P
Underweight	1.37	(0.80-2.37)	0.25	0.71	(0.77-5.42)	0.75
Normal weight	ref			ref		
Overweight	1.73	(1.49-2.05)	<0.01	1.19	(0.83-1.71)	0.34
Obese	1.75	(1.48-2.01)	<0.01	1.09	(0.73-1.63)	0.66

Results

Of all participants, 28.6% (n=1,177) had normal BMI with 1.4% (n=56) underweight, 37.8% (n=1,553) overweight, and 32.2% (n=1,325) obese. BMI showed no significant association with infertility testing (p=0.68), low sperm count (p=0.17), nor physical ability to impregnate someone (p=0.52). Larger proportions of men with elevated BMIs were noted to have impregnated someone (p<0.001), with overweight and obese men having 1.73 (95% CI=1.48-2.01, p<0.001) and 1.75 (95% CI=1.49-2.05, p<0.001) higher odds of impregnation, respectively. However, this association disappeared after adjusting for confounders.

Conclusions

This nationwide study demonstrates that no significant association exists between elevated male BMI and qualitative fertility factors. This further adds to the existing contradictory literature, and highlights potential awareness of extenuating confounding factors that may influence male fertility outcomes from social behaviors to environmental exposures. Thus, further investigation into male behaviors is required to pin-point precise factors that can potentially augment poor fertility outcomes.

Support

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References

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