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ABC TRIAL: APPRAISAL OF BODY CONTENT. FROZEN EMBRYO CYCLES ARE NOT IMPACTED BY THE NEGATIVE EFFECTS OF OBESITY SEEN IN FRESH CYCLES.

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OBJECTIVE: Prior research on over 200,000 SART IVF cycles has noted that implantation rate, clinical pregnancy rate, pregnancy loss rate, and live birth rate are all negatively impacted by obesity as defined by BMI (Provost et al 2016). While these findings are compelling, only fresh transfers were included in this study. This analysis seeks to determine if the negative impact of obesity may be ameliorated by frozen embryo transfer. Moreover, as BMI is derived from an individual's weight and height alone, the measurement does not account for age, gender, or body composition. These limitations expose BMI as an inexact metric for conferring negative effects of poor metabolic health on fertility. This analysis also explores use of bioelectric impedance analysis (BIA) and its estimation of adiposity as a more precise method of defining obesity.

DESIGN: Prospective cohort study

MATERIALS AND METHODS: Females and their male partners at a single center undergoing IVF from June 2016 - April 2018 were offered utilization of the InBody 770 BIA scale at time of vaginal oocyte retrieval to determine their body composition. Participant demographics, BMI, percentage body fat (%BF), IVF cycle outcome, and pregnancy data were recorded prospectively. Participants' %BF were analyzed to determine if increased adiposity impacted cycle outcome. Statistical analysis in this evaluation was performed using a mixed effects model accounting for female age and correlation among oocytes derived from the same cohort. An alpha error of 0.05 was accepted and a piecewise approximation was used to adjust for female age.

RESULTS: Data for 1248 females was collected during this study period. Neither female BMI nor %BF was significantly associated with rates of fertilization, blastulation, euploidy, or sustained implantation after adjusting for female age (Table 1). Adjusted OR of FET Cycle Outcomes

	Fertilization Rate	Blastulation Rate	Euploidy Rate	Sustained Implantation Rate
BMI	0.994 [0.984-1.004] p¼0.211	1.002 [0.993-1.011] p¼0.606	0.993 [0.982-1.005] p¼0.247	1.062 [0.920-1.228] p¼0.407
%BF	0.999 [0.993-1.005] p¼0.788	1.000 [0.994-1.005] p¼0.886	0.998 [0.992-1.005] p¼0.648	1.000 [0.987-1.014] p¼0.967
Visceral Fat Area	1.000 [0.991-1.010] p¼0.974	0.994 [0.985-1.002] p¼0.125	0.998 [0.998-1.009] p¼0.756	0.996 [0.977-1.017] p¼0.726
Mismatch: Normal BMI, High %BF	1.095 [0.917-1.306] p¼0.316	0.964 [0.826-1.112] p¼0.625	1.072 [0.892-1.288] p¼0.459	0.885 [0.610-1.282] p¼0.517
Mismatch: High BMI, Normal %BF	1.244 [0.962-1.609] p¼0.96	0.838		

[0.671-1.047] p¼0.119 1.220 [0.929-1.602] p¼0.152 1.187 [0.669-2.105] p¼0.557 e68
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CONCLUSIONS: Frozen embryo transfer appears to mitigate the negative effects of obesity seen in fresh cycles. BMI and %BF measurements determined by BIA do not appear to influence rates of fertilization, blastulation, euploidy or sustained implantation. The poorer outcomes seen in earlier studies may be attributed to a preexisting suboptimal endometrial milieu in obese patients that is exacerbated by effects of stimulation during fresh cycles.
References: 1. Provost MP, Acharya KS, Chaitanya RA, et al. Pregnancy outcomes decline with increasing body mass index: analysis of 239,127 fresh autologous in vitro fertilization cycles from the 2008-2010 Society for Assisted Reproductive Technology registry. *Fertil Steril* 2016; 105(3):663-669.