EXPRESSION LEVELS OF THE GROWTH – ARREST – SPECIFIC TRANSCRIPT 5 (GAS5) IN OVERWEIGHT AND OBESE CHILDREN AND ADOLESCENTS

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BACKGROUND

The noncoding RNA Growth-arrest-specific transcript 5 (*Gas5*) was initially discovered in a screen for potential tumor suppressor genes expressed at high levels during growth arrest. The *Gas5* gene produces an ubiquitous, polyadenylated, alternatively spliced message which is almost undetectable in actively growing cells, yet is highly expressed in cells undergoing serum starvation or density arrest. Its encoding gene, *Gas5,* is one of the 5'-terminal oligopyrimidine (5'TOP) class genes. Growth arrest by serum starvation or treatment with inhibitors of protein translation is associated with attenuated translation of 5'TOP RNAs and the inhibition of their degradation. The function of *Gas5* ncRNA is not well known. However, the *Gas5* gene, expresses from its intronic sequences multiple small noncoding nucleolar RNAs (snoRNAs) that are involved in the biosynthesis of ribosomal RNA. Moreover, *Gas5* RNA is a riborepressor of the Glucocorticoid Receptor, influencing cell survival and metabolic activities during starvation by modulating the latter's transcriptional activity.

OBJECTIVE AND HYPOTHESES

The aim of this study was to define the expression levels of Gas5 in whole blood samples of overweight and obese children and adolescents. *Gas5* may also help save energy resources as an adaptive response to starvation by restricting the expression of steroid-responsive genes, possibly in an organ- or tissue- and gene-specific fashion.

	No	Age (years)	BMI (kg/m²)
NORMAL	31	10,56±2,55	19,36±1,95
OVERWEIGHT	35	10,85±1,58	21,97±2,26
OBESE	34	10,92±3,43	27,44±3,98

		Samples	Mean	SD	SEM
NORMAL	MALE	17	0.98	0.689	0.1646
	FEMALE	14	1.1022	1.0766	0.2877
OVERWEIGHT	MALE	19	0.8981	0.655	0.1502
	FEMALE	16	0.8679	0.8114	0.2029
OBESE	MALE	19	0.8385	0.7704	0.1767
	FEMALE	15	1.5623	0.8844	0.2284

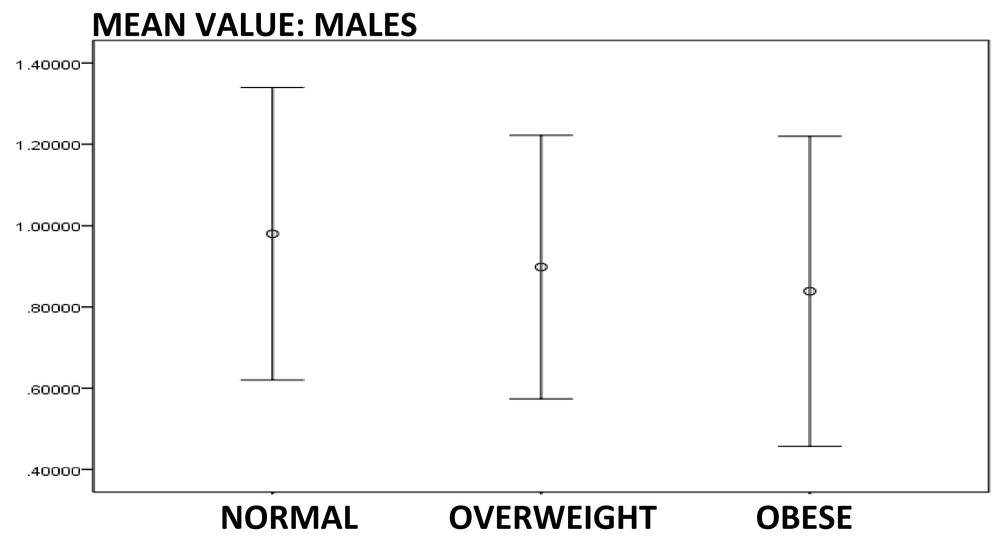
PATIENTS AND METHODS

One hundred children and adolescents were recruited to participate in the study following approval by the local Committee on the Ethics of Human Research. Of those, 31 had normal body mass index (BMI) (age: 10.56±2.55 yrs; BMI:19.36±1.95kg/m²; M: 17, F: 14), 35 were overweight (age: 10.85±1.58 yrs; BMI:21.97±2.26kg/m²; M: 19, F: 16) and 34 were obese (age: 10.92±3.43 yrs; BMI: 27.44±3.98kg/m²; M: 19, F: 15). Total RNA was isolated from peripheral blood samples and cDNA was prepared. RT-PCR was performed using the Light Cycler 480 Probes Master kit, employing primers and Taqman probes specifically designed for *Gas5* and *RPLP0* (used as control gene), on a Light Cycler 480 System (Roche). The Cp values obtained for *Gas5* expression were normalized for those of *RPLP0*.

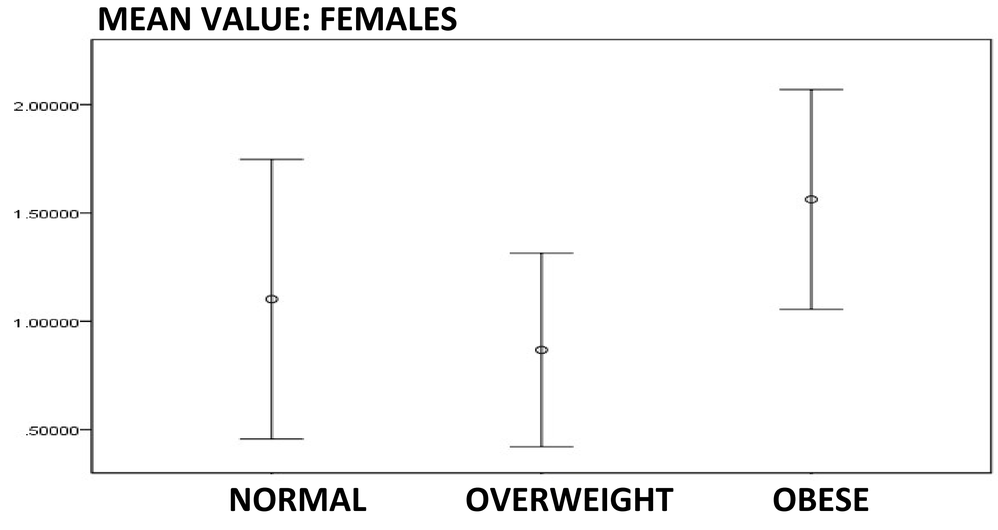
RESULTS

The mean and SEM values of *Gas5* normalized expression were calculated among the three subgroups of each gender group and among the two gender groups. None of the comparisons carried out revealed any statistical significance.

MEAN VALUE: MALES



MEAN VALUE: FEMALES



CONCLUSION

Our findings did not reveal any differences in the Gas5 expression levels in overweight and obese children and adolescents. This may be owing to the small number of samples, but also to the fact that this study was conducted *in vitro*.

The authors have no financial relationship(s) to disclose relevant to this poster presentation