THE EFFECT OF TRANSCRANIAL DIRECT CURRENT STIMULATION (TDCS) ASSOCIATED WITH HYPOCALORIC DIET IN SUBJECTS WITH DIFFERENT DEGREES OF GLUCOSE TOLERANCE

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Background

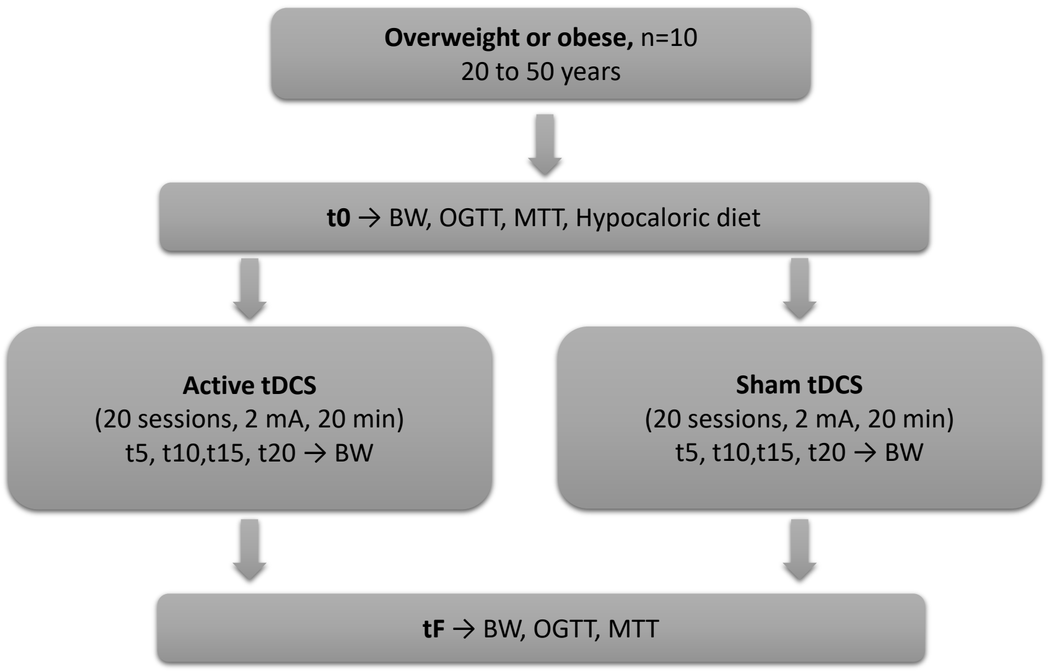
- Non-adherence to lifestyle modification is an important determinant of failure to treat obesity.
- The dorsolateral prefrontal cortex (DLPFC) plays an important role in appetite and food intake regulation and may be a target for electric brain stimulation

Aims

To test the effect of active tDCS over the right DLPFC associated with a hypocaloric diet on weight loss in overweight or obese adults.

Methods

- Randomized, placebo-controlled, double-blind pilot study.



- ClinicalTrials.org NCT 02683902, approved at UFRGS IRB 150119. Consent term was applied in all subjects.

Results

Question 1. How was the baseline and follow-up characteristics of the population at study according to the intervention?

	Active (n= 4)		Sham (n= 6)		*p* value*	GEE *p* value#
	Baseline	Post tDCS	Baseline	Post tDCS		
Age, *years*	38.2 ± 7	-	38.0 ± 2	-	0.940	-
Female sex, *n(%)*	3 (75)	-	3 (50)	-	0.571	-
Weight, *kg*	80.0 [62.4, 97.7]	77.3 [59.3, 95.0]	92.7 [82.5, 101.9]	90.9 [81.9,99.8]	-	0.091
Physical activity, *steps / day*	4190.0 [2529.2, 5850.9]	3849.1 [2460.5, 5327.6]	5172.0 [3323.7, 7020.3]	5087.9 [3500.2, 6675.6]	-	0.849
Glucose, *mg/dL*	91.8 [88.2, 95.4]	93.6 [86.4, 99]	91.8 [82.8, 99]	90 [82.8, 97.2]	-	0.503
2h glucose, *mg/dL*	104.4 [73.8, 135]	108 [104.4, 113.4]	102.6 [86.4, 117]	113.4 [91.8, 136.8]	-	0.683
A1c, *%*	5.8 [5.3, 6.3]	5.7 [5.2, 6.2]	5.3 [5.0, 6.0]	5.1 [4.9, 5.4]	-	0.379

Table 1. Data are expressed as absolute number (%), mean ± SD, or mean [95% CIs]; **p value was tested by Fisher's exact χ2 test for or Student's t test; #p value for interaction (tDCS by time) was tested by generalized estimated equation (GEE).*

Question 2. How was the effect of tDCS over body weight and BMI?

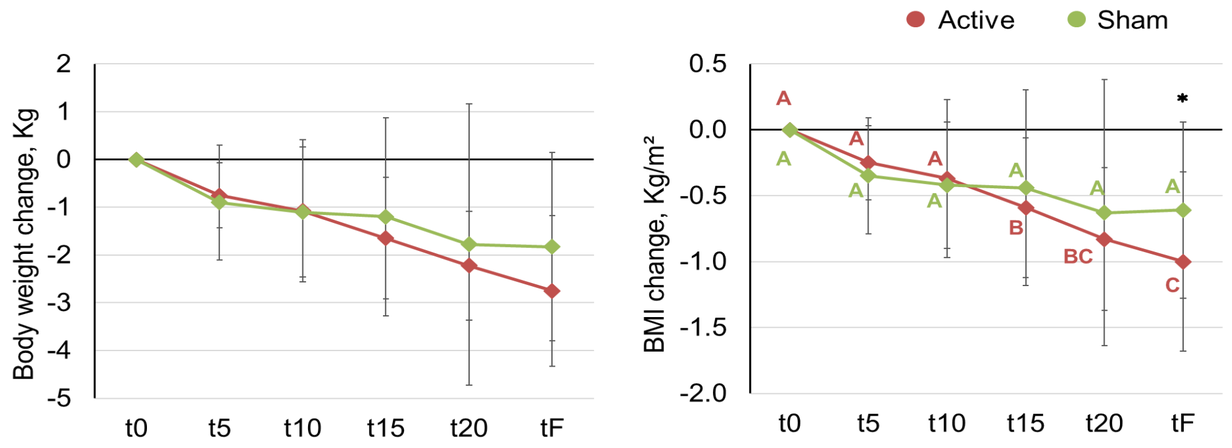


Figure 1. Data are means [95% CI]. *p* value for interaction (tDCS by time) was tested by GEE. *Significant difference between Active and Sham tDCS at a specific moment in the study. A, B and C indicates Bonferroni post- hoc analysis, means without a common capital letter differ in *time,* p<0.001.

Question 3. How was the adherence to the prescription diet of participants between groups?

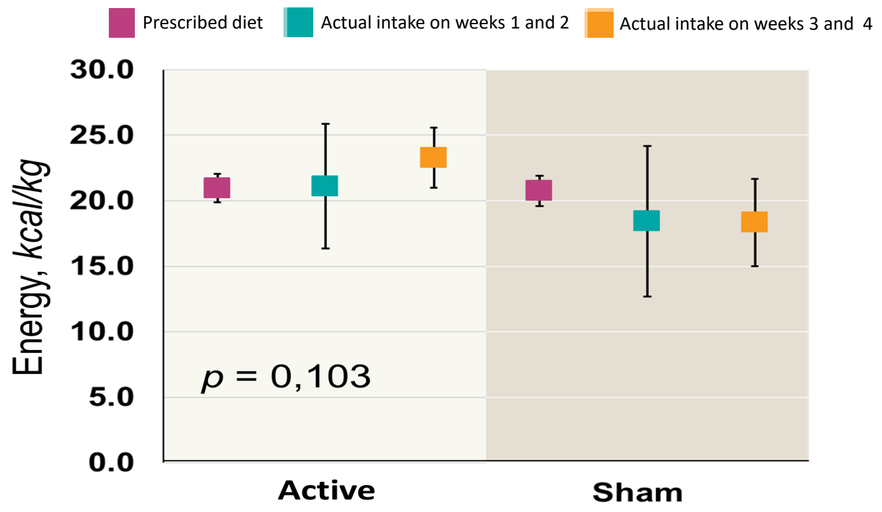


Figure2. Data are means [95% CI]. *p* value for interaction (tDCS by time) was tested by GEE.

Question 4. How was the effect of tDCS over the glycemic-insulinemic status?

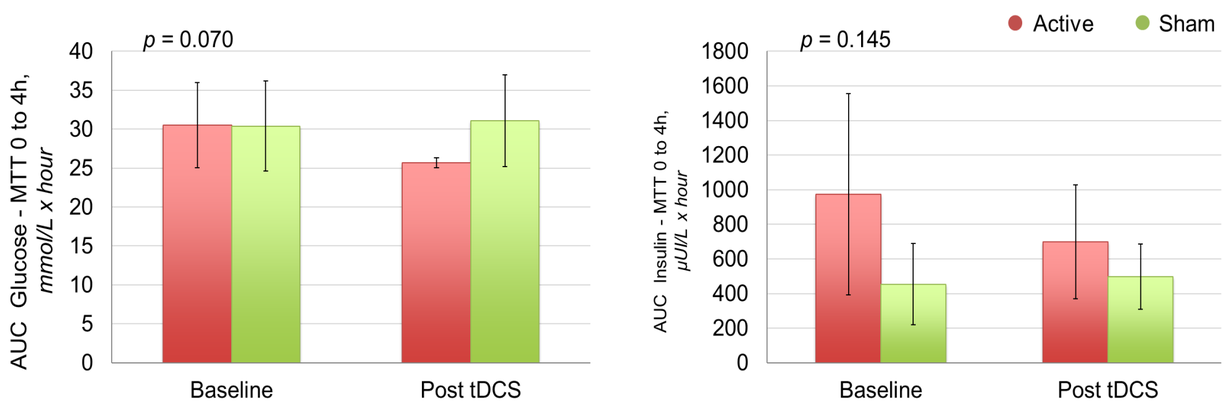


Figure 3. Data are means [95% CI]. * *p value for interaction (tDCS by time) was tested by GEE.*

Question 5. How was the effect of tDCS over depression and anxiety?

	Active (n= 4)		Sham (n= 6)		*tDCS by time p* value*
	Baseline	Post tDCS	Baseline	Post tDCS	
BDI, score	10.3 [4.8, 15.7]Aa	2.8 [0.5, 5.1]Ba	5,7 [3.2, 8.1]Aa	5.3 [2.5, 8.2]Aa	0.013
STAI- S, score	41.5 [32.9, 50.1]	32.3 [29.1, 35.5]	37.2 [30.6, 43.7]	30.7 [27.4, 33.9]	0.655

Table2. Data are expressed as means [95% CI]. * *p value for interaction was tested by GEE. Means without common capital letter differ in time, p< o.o5*

Conclusions

This preliminary analysis suggests that repetitive active a-tDCS may be a potential non-invasive and adjunctive treatment in addition to life style modification for obesity management.

Funding: