XXVI IFSO WORLD CONGRESS OF BARIATRIC & METABOLIC SURGERY

IFSO International Federation for the Surgery of Obesity and Metabolic Disorders

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XXXI CONGRESSO NAZIONALE

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

Gender differences and hydratation status in obese subjects treated with liraglutide

(*Preliminary data*)

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Congress President: **Prof. Luigi Angrisani**

DISCLOSURES

I have no potential conflict of interest to declare

BACKGROUND

Among the drugs approved for the treatment of obesity, ***liraglutide*** (a GLP-1 analogue) is one that is showing the best efficacy in terms of weight loss.

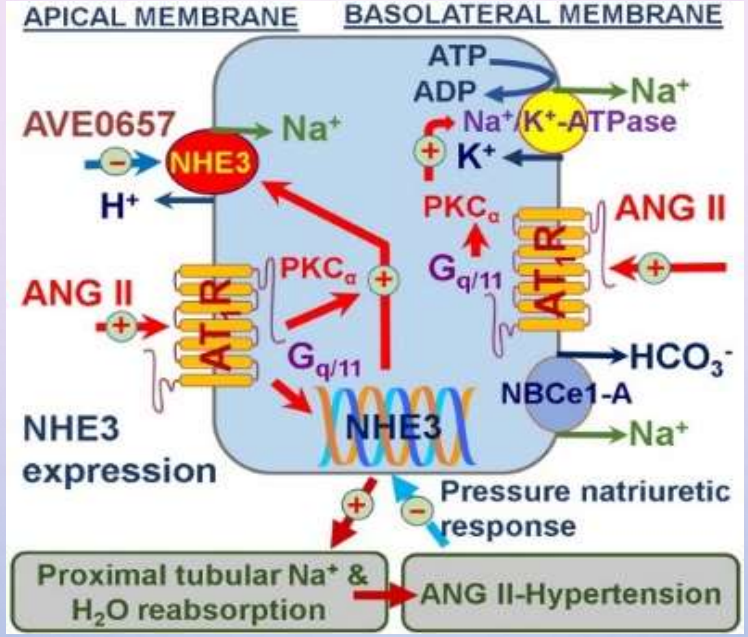
Am J Physiol Renal Physiol 301: F355–F363, 2011.
First published May 18, 2011; doi:10.1152/ajprenal.00729.2010.

Mechanisms mediating the diuretic and natriuretic actions of the incretin hormone glucagon-like peptide-1

Renato O. Crajoinas et al., 2011

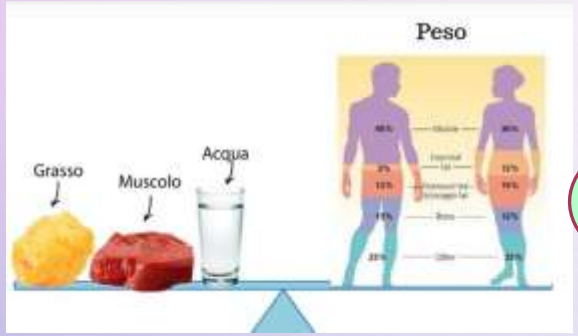
Studies in animal models have shown an <u>inhibitory effect</u> of GLP-1 on tubular Na^+/H^+ (NH3) exchanger isoform 3 resulting in increased **natriuresis** and **diuresis**.

BACKGROUND



Inhibition of NH3 seems to be due to **increased intracellular cAMP accumulation, PKA activation,** and **phosphorylation of the exchanger's COOH-terminal region** at the PKA consensus sites, serines 552 and 605.

AIM OF THE STUDY



Currently, there are still insufficient data in humans about the effects of GLP-1 analogs on **body composition** (BC) changes during weight loss and possible **gender differences.**

The aim of our study is to evaluate any gender differences in the **hydratation status** of subjects with obesity treated with liraglutide

STUDY DESIGN

27 Ob subjects (Table 1)

Attending at Outpatients Clinic of the I.P. "Diet Therapy in transplantation, renal failure and chronic pathology", University of Naples Federico II

Group A

(Treated for 3 months with daily s.c. liraglutide 3mg/dl + Mediterranean hypocaloric diet)

- Males
- Females

Group B

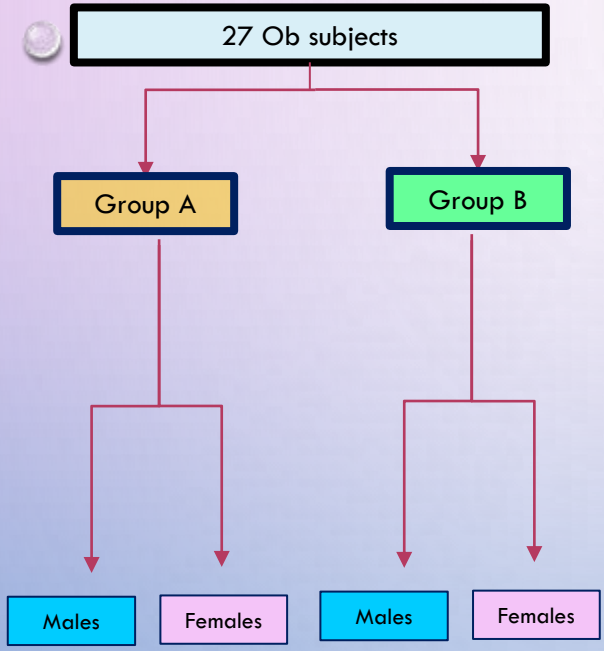
(Treated for 3 months with Mediterranean hypocaloric diet)

- Males
- Females

27 Ob	Group A (n° 13)	Group B (n°14)
Age (ys)	42,8 ± 8,9	43,4 ± 8,9
Gender (n° M)	6	5
Weight (Kg)	127,7 ± 35,0	128,2 ± 34,3
BMI (Kg/m²)	45,8 ± 10,0	46,0 ± 10,3
WC (cm)	130,7 ± 16,9	126,6 ± 14,8

Table 1. Study population

TIMELINE



Baseline

-Enrollment
-Division into two groups
-Anthropometric measurements and BC assessment

3 months

-Anthropometric measurements and BC assessment
-Data Analysis
-Gender stratification

MATERIALS AND METHODS

Discriminating between body fat and fluid changes in the obese adult using bioimpedance vector analysis

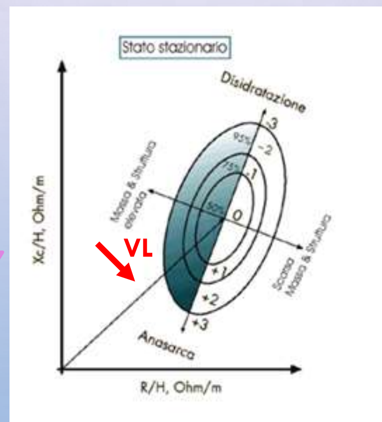
A Piccoli[1], A Brunani[2], G Savia[2], L Pillon[1], E Favaro[1], ME Berselli[2] and F Cavagnini[3]

REVIEW

Bioelectrical impedance vector analysis (BIVA) for the assessment of two-compartment body composition

R Buffa[1], E Mereu[1], O Comandini[1], ME Ibanez[2] and E Marini[1]

Conventional bioimpedance analysis (BIA) applied to any condition in which there is a **violation of the assumption of constant tissue hydration (73%)**, such as **Obesity**, propagates prediction errors. So, the direct use of raw electrical data obtained from BIA analysis through bioelectrical impedance vector analysis (**BIVA**) was proposed and employed in the study



Hydration status was assessed by measuring the **length of the vector (VL)** along the longitudinal axis of the BIVA graph ($p < 0,05$, i.e. significant Hotelling's T2 test)

RESULTS

After 3 months, the mean **ΔBMI%** in Group A and Group B was 5.72% and 5.61%, respectively, with **no statistical significance** when compared with each other (Group A vs Group B $p > 0.05$).

In Group A, there was a **significant increase in Vector Length (VL)** after *3 months* of treatment compared to the *Baseline* ($p < 0.05$) (**Figure 1**), assessed from BIVA.

Unconfirmed finding in Group B

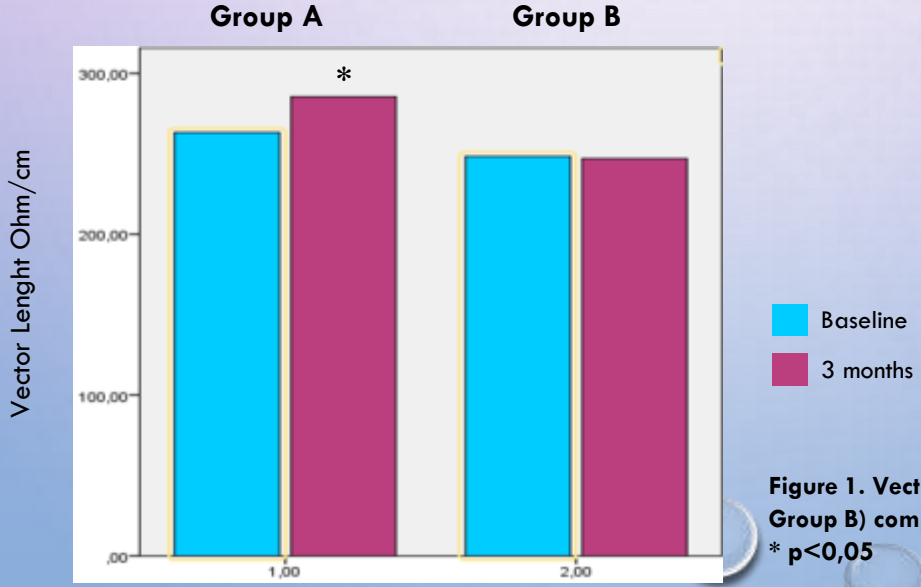


Figure 1. Vector length in the two groups (Group A and Group B) comparing after 3 months vs Baseline
*** p<0,05**

RESULTS

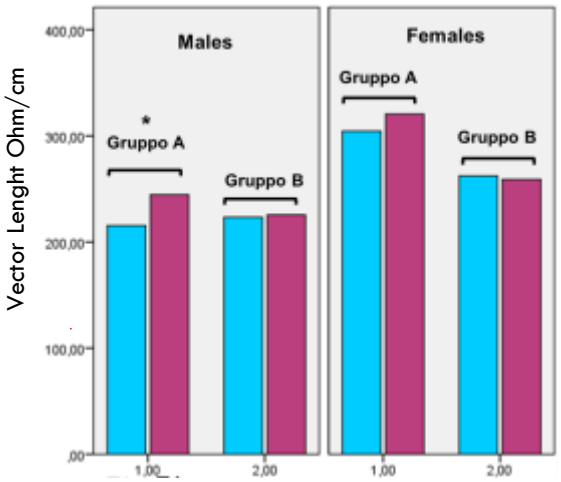
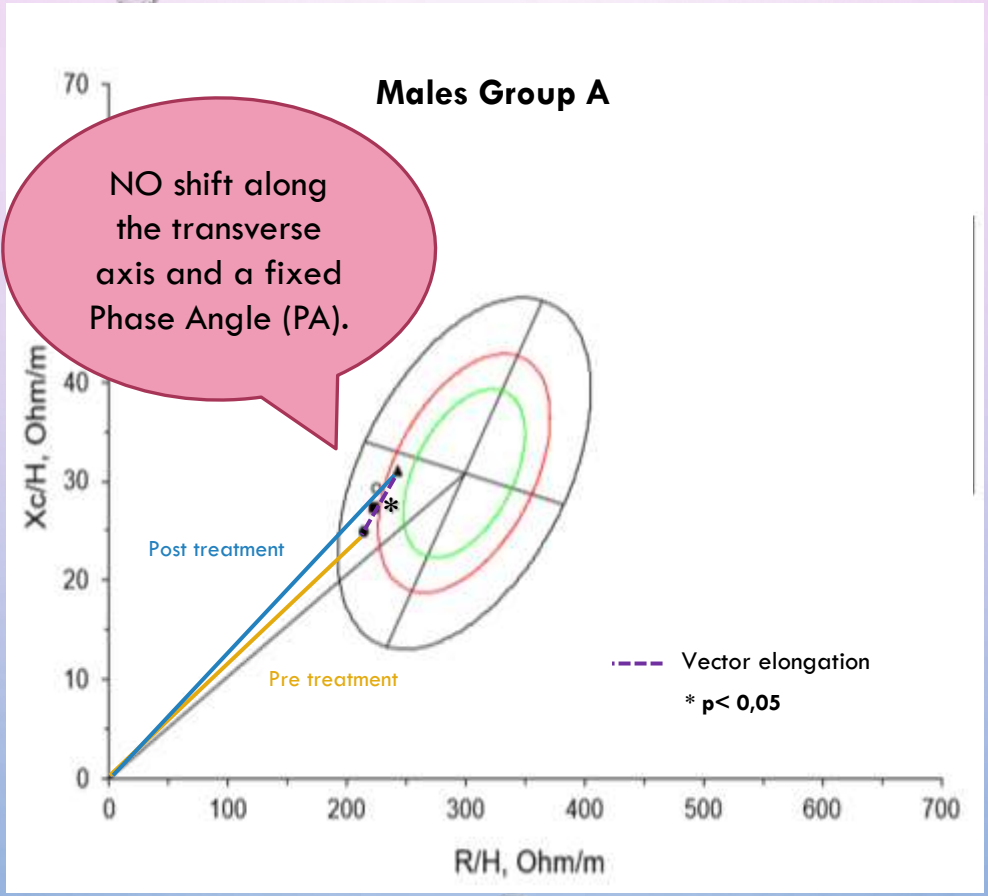


Figure 2. Vector length in the two groups (Group A and Group B) compared after 3 months vs Baseline, stratified by gender
*** p<0,05**

The two groups stratified by gender showed a **significant increase in VL** after *3 months* of treatment compared to the *Baseline* only in ***men*** (244.6 vs 215.3, $p < 0.05$) ***belonging to Group A***.

RESULTS


Males Group A
NO shift along the transverse axis and a fixed Phase Angle (PA).
Xc/H, Ohm/m
R/H, Ohm/m
70
40
30
20
10
0
0
100
200
300
400
500
600
700
Post treatment
Pre treatment
*
Vector elongation
* p< 0,05

RESULTS

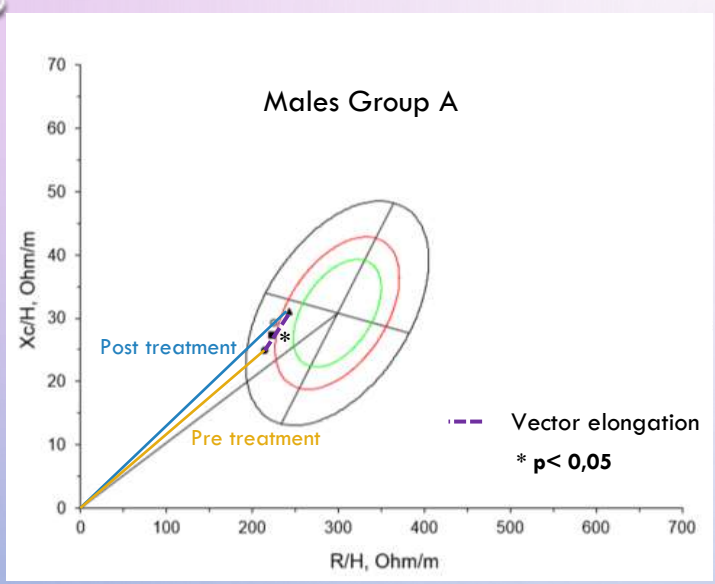
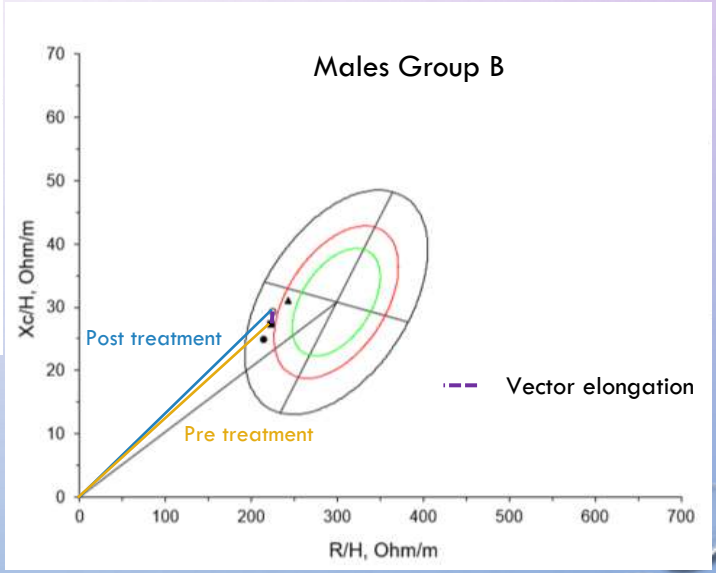


Figure 3A. BIVA after gender stratification, in Males.

No significant differences were found in either VL or PA in the other subgroups (**Figures 3A and 3B**)



RESULTS

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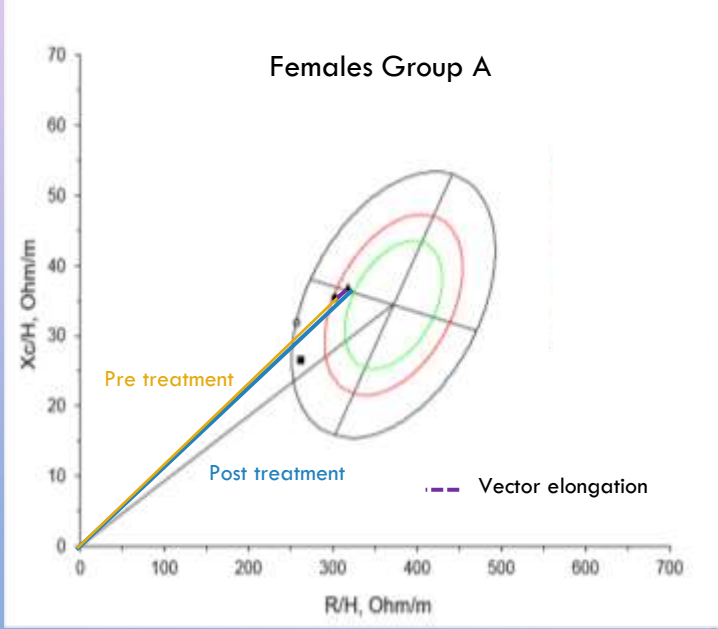

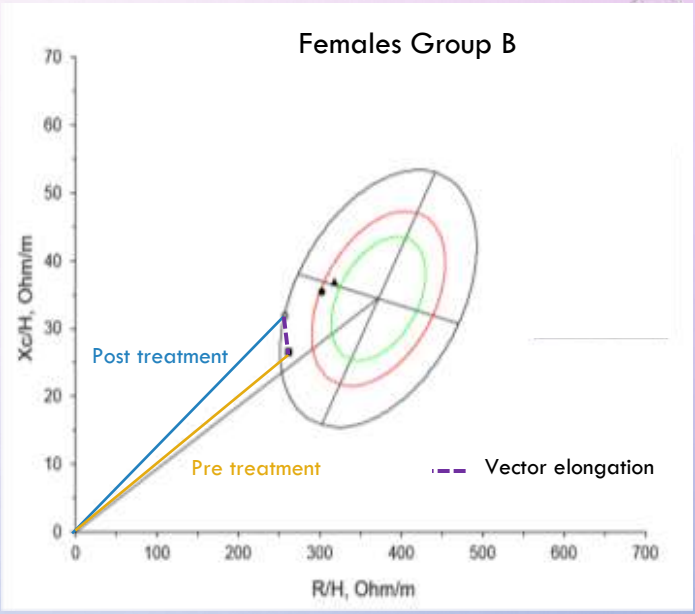

Figure 3B. BIVA after gender stratification, in Females

CONCLUSIONS

While taking into account the small sample size, our results confirm data in the literature and suggest a **gender-specific diuretic effect of liraglutide,** used for the treatment of obesity.

The ***diuretic effect*** could be inferred from a change in ECW (**Vector elongation**) without worsening BCM (**Phase Angle fixity**)

CONCLUSIONS

Comments

Assuming that most of the animal model studies on this topic have been performed on male animals…(Possible Bias?)

Hormonal factors could be involved in the observed gender differences

We expect to confirm these preliminary results in a larger sample. Our intention is to expand the sample size to go deeper in this research

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THANKS FOR THE ATTENTION