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Lipid Dysregulation in seminal and follicular fluids could affect gonadal response

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INTRODUCTION

Human Reproduction, Vol.25, No.2 pp. 308–316, 2010
Advanced Access publication on November 25, 2009 doi:10.1093/humrep/dep416

human
reproduction

ORIGINAL ARTICLE *Andrology*

Increased lipid peroxidation and abnormal fatty acid profiles in seminal and blood plasma of normozoospermic males from infertile couples

I. Oborna^{1,4}, G. Wojewodka², J.B. De Sanctis³, H. Fingerova¹,
M. Svobodova¹, J. Brezinova¹, M. Hajduch¹, J. Novotny¹,
L. Radova¹, and D. Radzioch²

Human Reproduction, Vol.29, No.11 pp. 2522–2529, 2014
Advanced Access publication on September 29, 2014 doi:10.1093/humrep/deu249

human
reproduction

ORIGINAL ARTICLE *Reproductive endocrinology*

Lipid profiles and ovarian reserve status: a longitudinal study

Fahimeh Ramezani Tehrani^{1,*}, Hadi Erfani^{1,2}, Leila Cheraghi¹,
Maryam Tohidi³, and Fereidoun Azizi⁴



Endocrinology & Metabolism International Journal

Lipid Dysregulation in Seminal and Follicular Fluids could be Related with Male and Female Infertility

In conclusion, altered sperm parameters and low ovarian reserve are associated with elevated triglycerides and fatty acids in seminal plasma and ovarian follicular fluid. Gamete maturation within this lipid-rich environment is detrimental to spermatozoa and oocytes.

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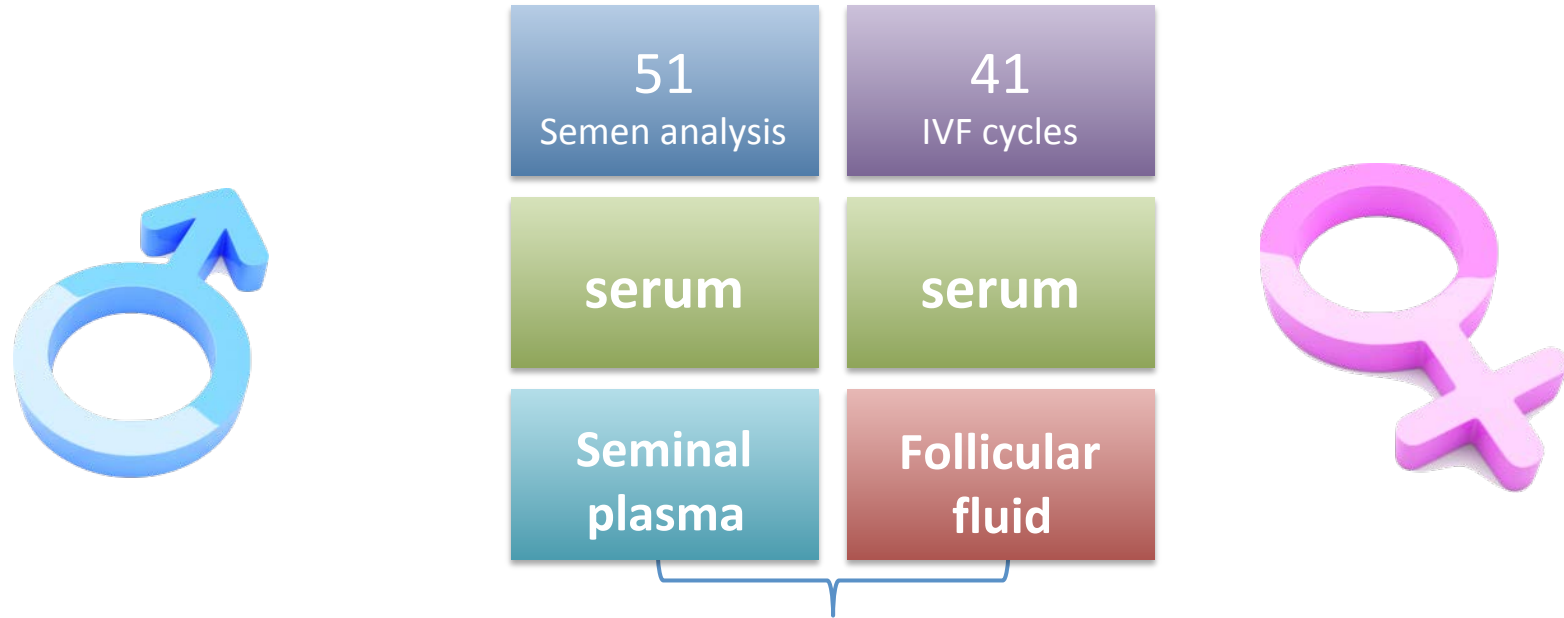
²Galicia Sur Health Research Institute, Spain

³Hospital Virgen de la Luz, Spain

OBJECTIVE

Our objective was to obtain, through principal component analysis (PCA), a lipid profile in seminal plasma and follicular fluid that reflects the effect of lipid metabolism on the gonadal response, regardless of age and BMI.

METHODOLOGY



Cholesterol(CT) , Tryglicerides (TG)

(DAOS method)

Non-esterified fatty acids *(colorimetric enzymatic method)*

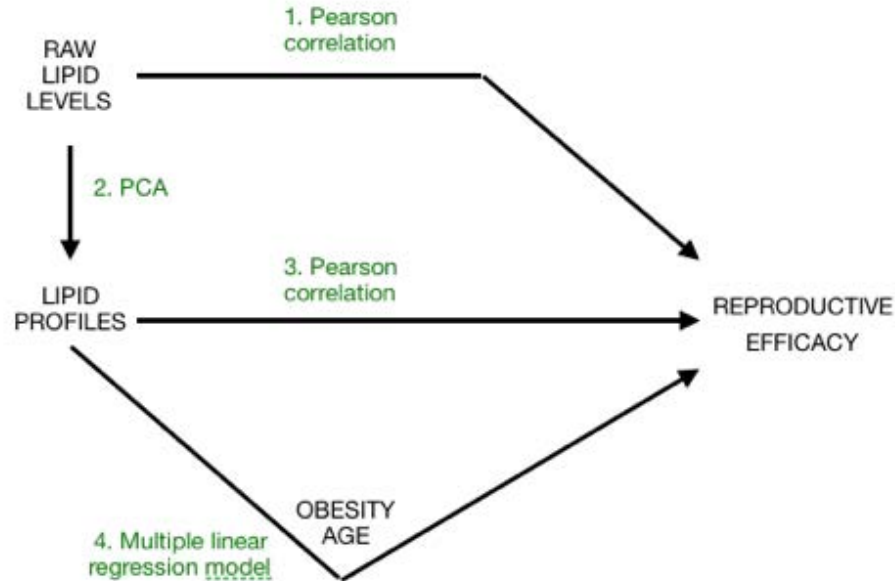
METHODOLOGY

The parameters used to assess gonadal response were number of motile spermatozoa and number of oocytes in metaphase II.

- In order to clarify the relationship between the plasmatic and the gonadal lipid levels with the reproductive efficacy, we use Pearson correlation.
- We use Principal Components Analysis to reduce the information on the previous nine lipids variables into a small set of only three new variables or principal components that still contains most of the initial information, and we cross them again with reproductive results using Pearson correlation.

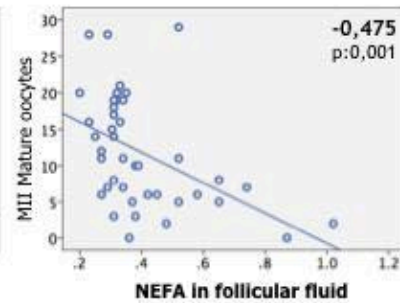
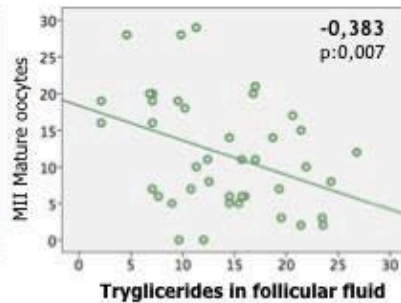
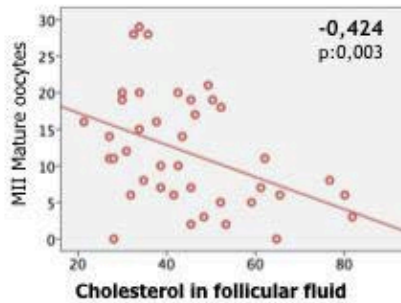
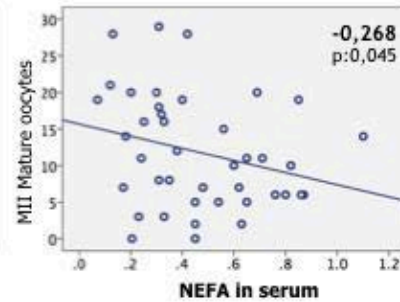
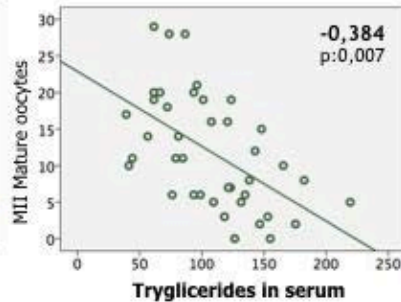
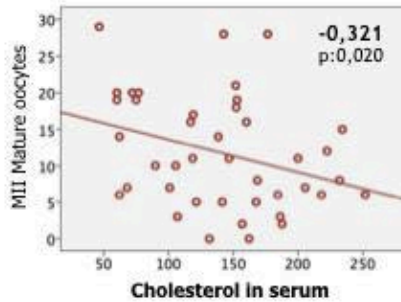
METHODOLOGY

An ultimate test without confounding effect of age and obesity was carried out using a multivariate linear regression model.



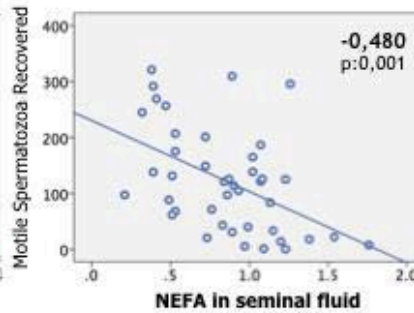
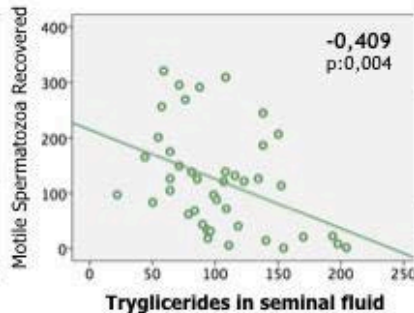
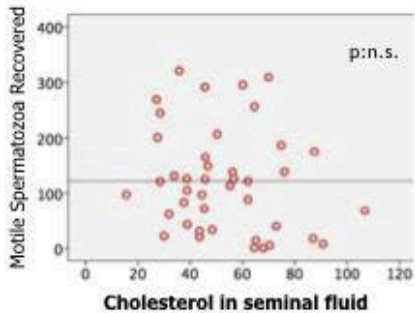
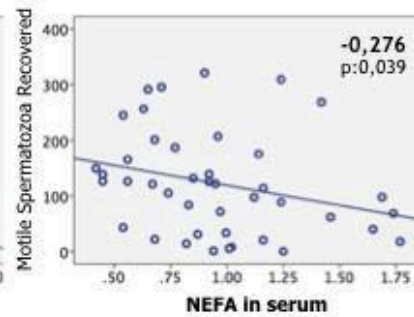
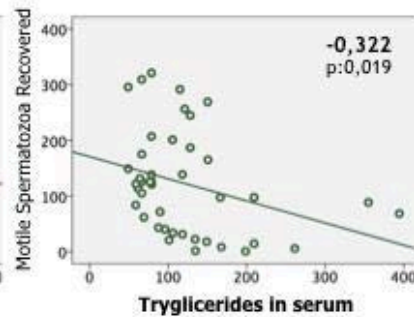
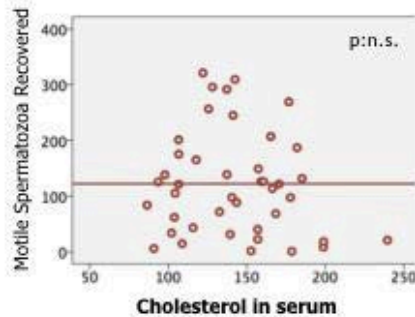
RESULTS

Cholesterol, triglycerides and NEFA concentration in serum and FF.



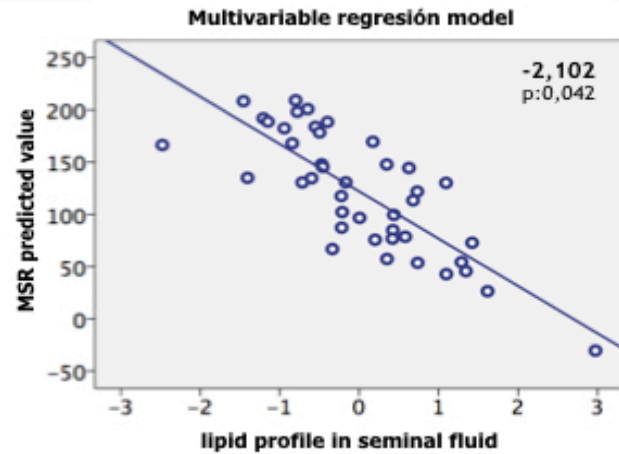
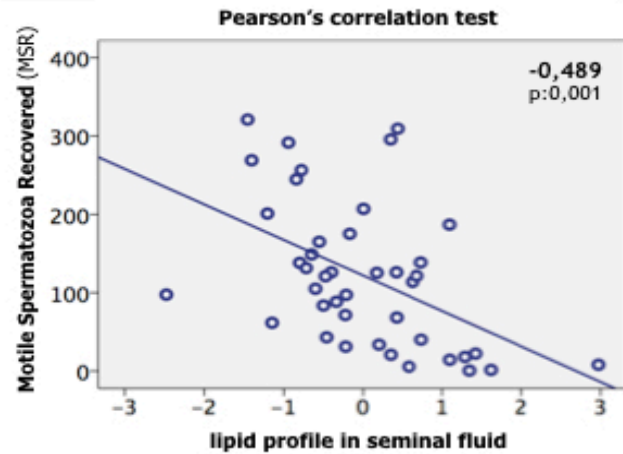
RESULTS

Cholesterol, triglycerides and NEFA concentration in serum and semen.



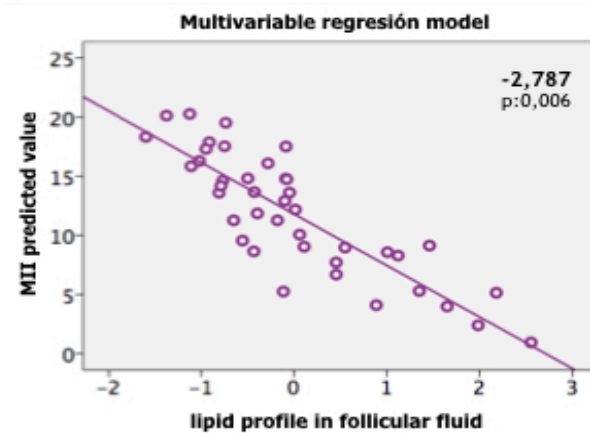
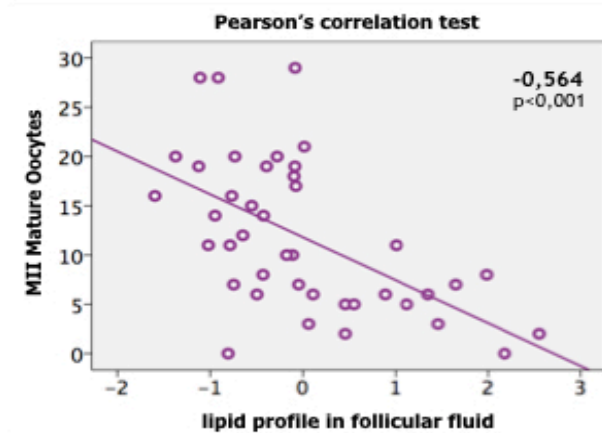
RESULTS

Correlation between the lipid profile in seminal fluid and motile spermatozoa recovered.



RESULTS

Correlation between the lipid profile in follicular fluid and metaphase II oocytes recovered.



CONCLUSIONS

- This study highlights a significant influence of the lipid profile in follicular fluid and seminal plasma on the gonadal response. The effect can be observed on seminal production in the case of men and follicular response to hormonal stimulation in the case of women.
- The gonadal lipid profile is the only variable analyzed that maintains a statistical significance independent to the rest of the covariates (age and BMI), something that does not happen with the plasma lipid profile.
- These findings can lead to improvements in fertility assessment by the addition of lipid screening.

A person wearing a blue lab coat is using a microscope in a laboratory. The person's hands are visible, one holding the microscope's handle and the other adjusting a component. The microscope is positioned over a sample stage. The background shows laboratory equipment and a power outlet. The text "THANK YOU VERY MUCH" is overlaid in white, bold, sans-serif font, with a vertical line to its left.

THANK YOU
VERY MUCH