

Oral presentation

## The use of self-organizing maps to study fatty acids in neuropsychiatric disorders

Massimo Cocchi\*, Luciano Tonello and Glenda Cappello

Address: University of Bologna, Italy

\* Corresponding author

from International Society on Brain and Behaviour: 3rd International Congress on Brain and Behaviour  
Thessaloniki, Greece. 28 November – 2 December 2007

Published: 17 April 2008

*Annals of General Psychiatry* 2008, **7**(Suppl 1):S84 doi:10.1186/1744-859X-7-S1-S84

This abstract is available from: <http://www.annals-general-psychiatry.com/content/7/S1/S84>

© 2008 Cocchi et al.; licensee BioMed Central Ltd.

In our study we have evaluated the theme of the platelet fatty acid composition in subjects with a clinical diagnosis of Major Depression (MD). We have investigated 84 subjects (51 females and 33 males, mean age: 60.21, SD:  $\pm$  12), compared with 60 control, apparently healthy subjects (38 Males and 22 Females, mean age: 33.97, SD:  $\pm$  12.40). The tools used for the diagnosis of Major Depression were: Clinical Global Impression (CGI), Symptoms Check List-90 (SCL-90), Medical and Pharmacological history, BMI, Structured Clinical Interview DSM-IV-SCID-IV (American Psychiatric Association 2000), Hamilton Rating Scale of Depression (HRSD).

We have analysed the groups without taking in account therapies, gender and age. The results obtained show the evidence of three fatty acids, Arachidonic Acid (AA), Linoleic Acid (LA), and Palmitic Acid (PA) in a peculiar position with respect to the biochemical characterization of MD. The ratio among the three fatty acids, in the different conditions studied, allows us to do the hypothesis that the MD is linked to a possible un-balance of the membrane function. The depressive condition, according to the fatty acid composition, is characterized by a progressive increase of the degree of un-saturation of the platelet fatty acids in most of the patients, while a consistent group is characterized by an increase of the degree of saturation. These findings in platelets seem to be more specific indicators with respect to the red blood cell fatty acids and plasma phospholipid fatty acids.

In conclusion, from the study, we can assume:

- 1) AA, LA and PA are the three main lipid biochemical markers in platelets that characterize the MD.
- 2) The constant sum of the three fatty acids ( $AA+LA+PA = 53.33 \pm 3.43$ ) in all the conditions studied other than the depressive and normal people, gives reason of the role that they play in the membrane balance. In particular the coefficient of correlation between the sum of AA and LA versus PA was highly significant:  $r = -.66$  ( $p=0.00$ )
- 3) The differences of the degrees of un-saturation and of saturation in the platelets of the subjects could be a signal of a different condition within the same pathology. The use of the Artificial Neural Network (ANN) to analyse the modifications of the fatty acids allows us to confirm, from a biochemical point of view, the clinical diagnosis of MD.
- 4) It is possible that the blood platelets fatty acids (AA, LA, PA) are strong specific markers also in other psychiatric conditions and that they are an easy way to forecast, at least the MD, possibly, other pathologies.