

Decreased concentrations of branched chain amino acids, tryptophan, methionine and threonine in follicular fluid of idiopathic infertile females

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INTRODUCTION

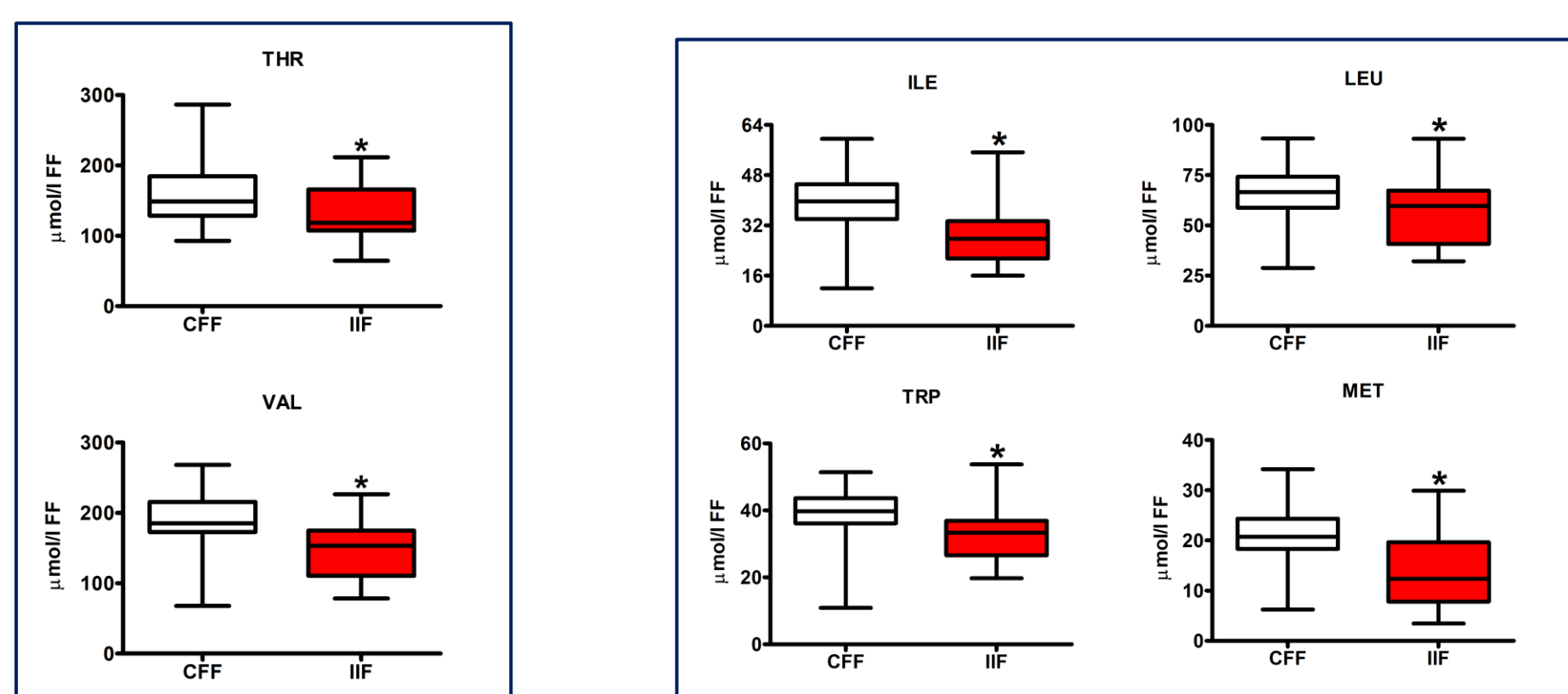
Previous studies analyzing follicular fluid (FF) amino acid content in female with fertility problems gave conflicting results. Either increase or decrease in specific amino acids were reported in patients with endometriosis, polycystic ovarian syndrome, diminished ovarian reserve. To date, no data are available concerning free amino acid concentration in FF of females with unexplained infertility.

STUDY DESIGN

Cross-sectional study. We included two women groups: fertile controls (n = 34); and idiopathic infertile women (n = 20). FF of each participant was properly processed by high performance liquid chromatography (HPLC) to determine concentrations of free amino acids and amino group-containing compounds (25 compounds). Patients were studied from September 2018 to January 2020.

RESULTS

Among the 25 free amino acids (FAA) quantified in FF, idiopathic infertile females (IIF) had lower values (expressed in $\mu\text{mol/l}$) of valine (147.27 ± 41.06 , $p < 0.005$), isoleucine (28.89 ± 9.62 , $p < 0.001$), leucine (56.79 ± 16.12 , $p < 0.01$), tryptophan (33.37 ± 8.79 , $p < 0.05$), methionine (13.81 ± 7.27 , $p < 0.005$) and threonine (131.11 ± 44.18 , $p < 0.05$) than those found in control fertile females (CFF) (valine = 189.88 ± 36.83 $\mu\text{mol/l}$; isoleucine = 39.60 ± 8.63 ; leucine = 67.57 ± 13.77 ; tryptophan = 39.32 ± 7.39 ; methionine 21.16 ± 5.17 ; threonine (159.60 ± 43.22).



CONCLUSION

Due to the relatively limited number of patients, no statistical correlations were found among the concentrations of essential amino acids in FF and IVF outcome. Although tendency to increase oocyte quality and good blastocysts rate were observed in patients with higher FAA concentration. Since these defective amino acids are involved not only in protein synthesis, but also in energy-related metabolic functions and DNA or protein methylation it is possible that their defect in FF affects negatively oocyte and embryo development in unexplained infertility.