BDNF Val66Met polymorphism predicts differential response to antidepressants in depressed Caucasians patients.

R. COLLE[1], F. GRESSIER[1], C. VERSTUYFT[2], L. BECQUEMONT[2], E. CORRUBLE[1]

[1]Inserm U669, Department of Psychiatry, Univ Paris Sud, Assistance Publique-Hôpitaux de Paris, Bicêtre University Hospital, France.
[2]EA 4123, Univ Paris Sud, Department of Molecular Genetic, Pharmacogenetic and Hormonology, Assistance Publique-Hôpitaux de Paris, Bicêtre University Hospital, France.
Corresponding Author: romaincolle@hotmail.com

INTRODUCTION

Whether the Brain Derived Neurotrophic Factor (BDNF) Val66Met polymorphism can predict antidepressant efficacy in depressed patients remains unclear, suggesting that it may depend on antidepressant classes(Niitsu et al. 2013). This question is relevant for public health since antidepressant response and remission are still difficult to predict in depressed patients (Kupfer et al. 2012). we investigated whether antidepressant drug response and remission were influenced by the Val66Met polymorphism and antidepressant classes in Caucasian patients.

MATERIALS AND METHODS

Design: 3-month prospective, real-world setting treatment study, patients with a current major depressive episode (MDE) in major depressive disorder were assessed at the beginning of antidepressant treatment and 3 months later.

Genotyping was performed blind to clinical data. Participants were classified into two groups: Val/Val and Met (Met/Met and Met/Val genotypes), on account of the dominant nature of the Met allele.

The Antidepressants studied were the 3 most commonly prescribed classes of antidepressants: SSRI, SNRI and tricyclic antidepressants (TCA). Antidepressant drugs were studied in two groups, SSRI versus SNRI/TCA. An antidepressant monotherapy was required.

The Responder rate 3 months post-treatment based on the HAMD score was defined a-priori as the main outcome measure. The Clinic Global Impression scales (CGI) were the secondary outcome criteria.

RESULTS

Sample comprised 345 patients. Their mean age was 45.2 years. 66.7% were women. 75.6% had a recurrent MDD. The baseline scores were was 24.5 for the HAMD-17 and 20.4% were antidepressant naïve at baseline. Of note, patients who prematurely dropped out (48.4%) from the study did not significantly differ from completers.

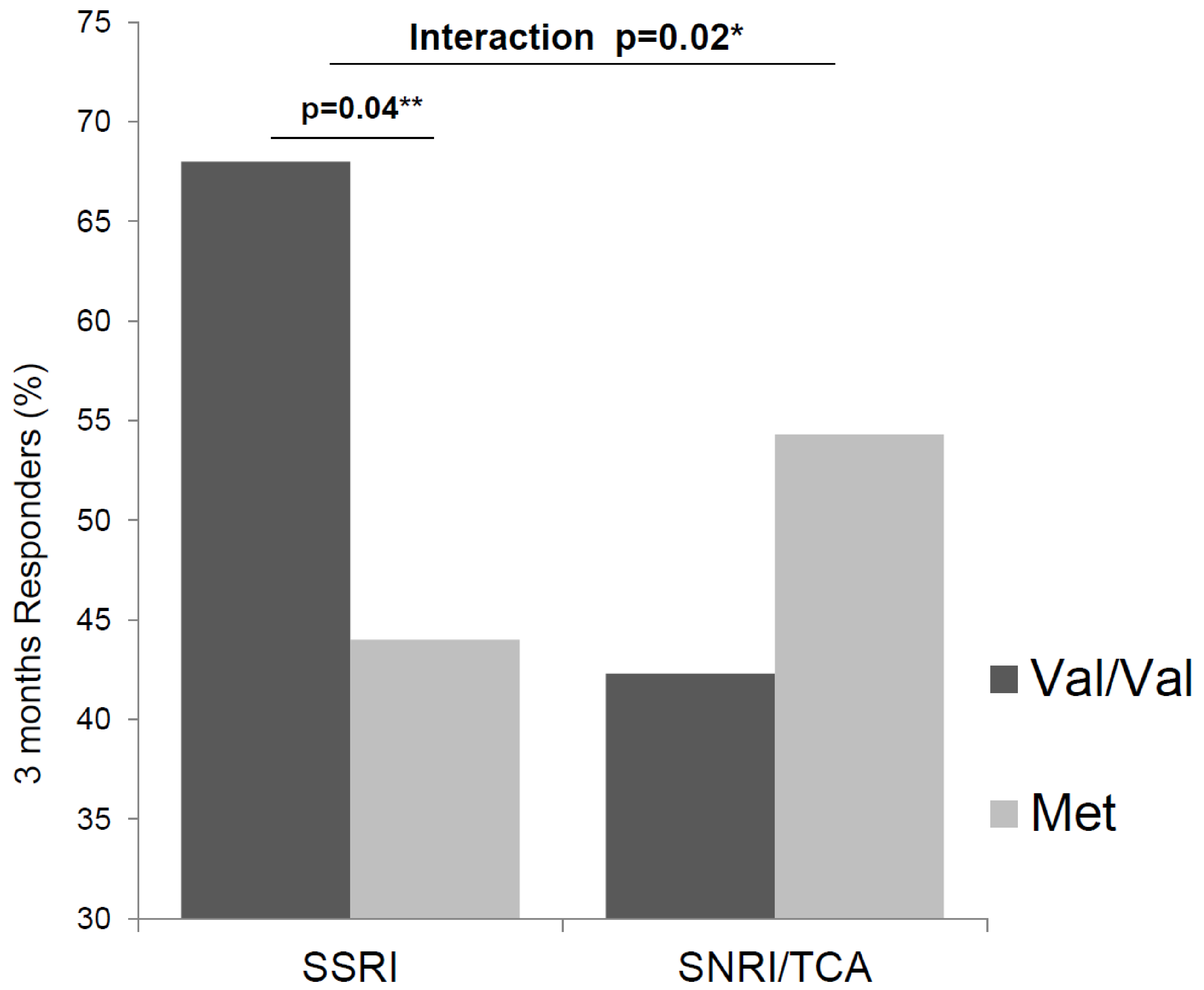
Antidepressants

44.1% patients were treated with SSRI, 55.9% patients were treated with SNRI (45.2%) or TCA (10.7%). Patients treated with SSRI did not differ from those treated with SNRI/TCA, except for age and previous antidepressant drug treatments: they were younger and were more often antidepressant naïve. Thus, further analyses have been adjusted for these variables.

Genotypes

The Val/Val group comprised 67.0% patients. The Met group comprised 33% patients (Val/Met: 28.1%; Met/Met: 4.9%). No significant deviation from Hardy-Weinberg equilibrium was reported. Genotyping distribution did not differ regarding patient characteristics, attrition rates, antidepressant classes, response and remission rates.

Figure 1: Interaction of BDNF Val66Met polymorphism and antidepressant classes (SSRI versus SNRI/TCA) on responder rates 3 months post-treatment.



Responders: decrease in the Hamilton Depression Rating Scale score of at least 50% from baseline to 3 months; SSRI: Serotonin Selective Reuptake Inhibitor; SNRI/TCA: Serotonin and Norepinephrine Reuptake Inhibitor and tricyclic antidepressants; * : p<0.05 in multivariate model adjusted for propensity-score deciles; **:p<0.05 in multivariate model adjusted for age and drug naives

The percentage of responders was explained by a significant **interaction between the Val66Met polymorphism and antidepressant classes** (OR=0.23, IC95% [0.06; 0.81], p=0.02) (Figure 1). The interaction was still significant while adjusting for propensity-score deciles. Similar results were obtained with the CGI.

Val/Val patients had a higher response rate with SSRI than with SNRI/TCA (68.1% versus 42.3%; adjusted-OR= 2.60, IC95% [1.14; 6.11], p=0.02). The NNT was equal to 4.

In **Met** patients, no significant difference was founded probably because power was 26% for responder rates 3 months post-treatment.

With **SSRI**, Val/Val patients had a higher response rate 3 months post-treatment than Met patients (68.1% versus 44%; adjusted-OR= 3.04, IC95% [1.05; 9.37], p=0.04). The corresponding NNT was equal to 4.

With **SNRI/TCA,** Val/Val had lower improvement on the CGI-I 3 months post-treatment than Met (unadjusted-HR=1.43, IC95% [0.93; 2.25], p=0.10; adjusted-HR=1.57, IC95% [1.01; 2.44], p<0.05).

CONCLUSION

The BDNF Val66Met polymorphism strongly influences antidepressant response in Caucasian patients, in a different manner for SSRI and SNRI/ TCA. Indeed, Val/Val patients have a higher than two-fold increased probability of 3-month response to SSRI as compared to SNRI/TCA. And with SSRI, Val/Val patients have a 3 fold increased probability of 3-month response rate than patients carriers of Met allele but lower improvement with SNRI/TCA. Thus, our results suggest that SSRI should be recommended for Val/Val and SNRI/TCA should be recommended for Met. These results argue for a personalized approach of antidepressant prescription based on the BDNF Val66Met polymorphism.

References

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There is no potential conflict of interest