Dissociable Temporal Effects of Bupropion on Behavioural Measures of Emotional and Reward Processing in Major Depressive Disorder

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INTRODUCTION

- Previous research indicates that early in treatment, prior to an improvement in mood, SSRIs and/or SNRIs can remediate negative biases in emotional processing observed in MDD.
- The effects on reward processing potentially relevant to the treatment of anhedonia are less clear but may be particularly affected by antidepressants with an effect on dopamine function.
- Therefore, this study aimed to investigate the early and longer-term effects of the dopamine and noradrenaline reuptake inhibitor bupropion on behavioural measures of emotional and reward processing in MDD patients.

METHODS

- 41 MDD patients and 40 healthy controls participated in a repeated measures study design.
- Open-label bupropion was administered to just the MDD patients over a 6 week period.
- All participants completed the Emotional Test Battery and a probabilistic instrumental reward learning task at baseline, week 2 and week 6.

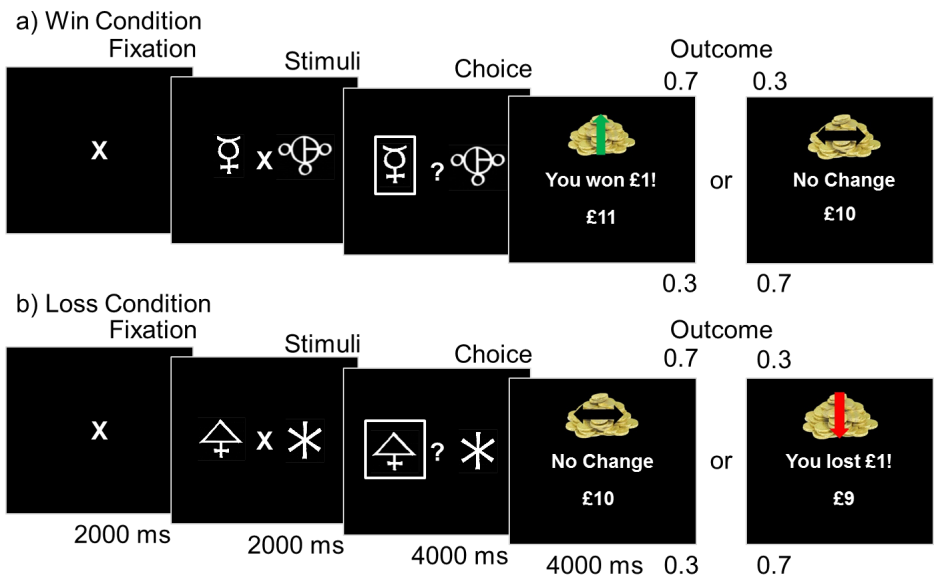
Facial Expression Recognition Task

- Participants were presented with an emotional facial expression for 500 ms and asked to categorise the expression as anger, disgust, fear, happy, sad, surprise or neutral.
- Each emotion had different intensity levels ranging from neutral (0%) to full intensity (100%) in 10% steps.

Emotional Recall Task

- Participants were asked to recall as many positive and negative self-referent words used in a previous encoding task as they could in 2 minutes

Probabilistic Instrumental Reward Learning Task



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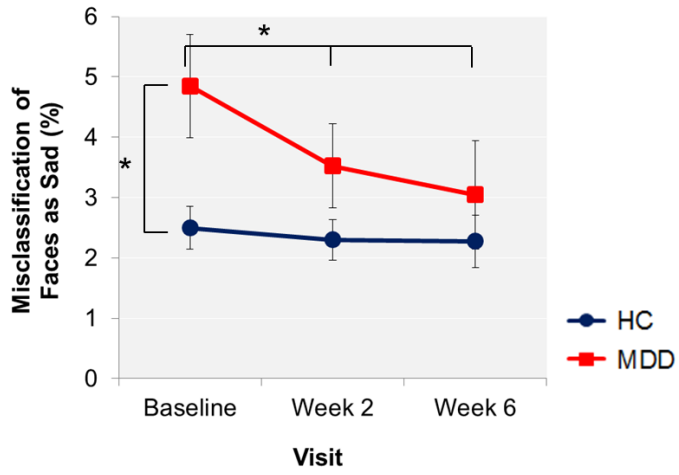
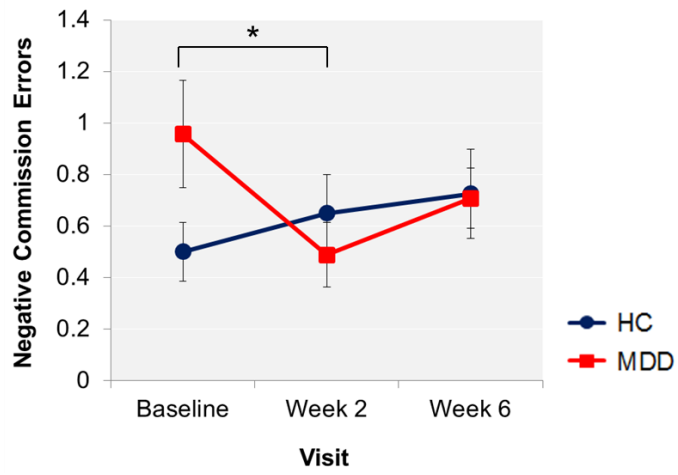
RESULTS

- The bupropion-treated MDD group displayed:

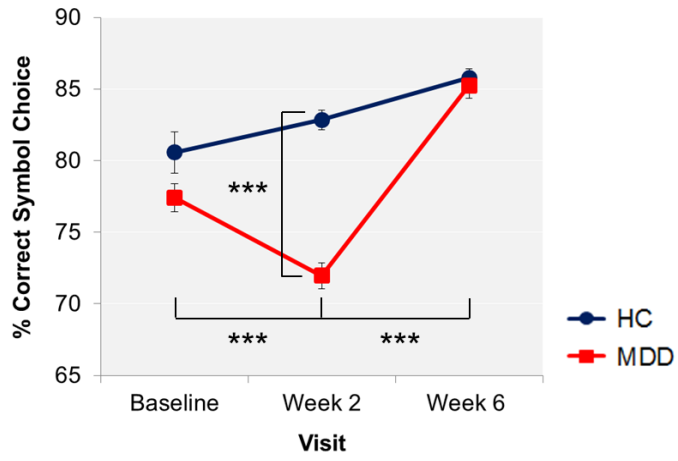
1. A significant decrease in the % misclassification of other faces as sad between baseline and week 2 ($F_{1,\ 80} = 4.09$, $p < 0.05$; $t_{41} = 2.72$, $p < 0.05$) such that the group difference at baseline was no longer significant.



2. A significant decrease in the number of negative self-referent words falsely recalled between baseline and week 2 ($F_{1,\ 81} = 5.73$, $p < 0.05$; $t_{42} = 2.12$, $p < 0.05$).



3. A significant decrease in the likelihood of choosing the symbol associated with high-probability win between baseline and week 2 ($t_{14} = 4.17$, $p < 0.01$), prior to normalisation to HC levels after the full 6 week treatment.



DISCUSSION

- Early in treatment, bupropion acts to reduce negative biases in emotional processing but worsens reward processing.
- The beneficial actions of bupropion on reward processing then occur later in treatment.
- Such dissociation in the temporal effects of bupropion on emotional and reward processing has implications in the treatment of the different symptoms of negative affect and anhedonia in MDD.