Investigating the Effects of Typhoid Vaccine on Sleep in Healthy Participants: a randomised, double- blind, placebo-controlled, cross-over study

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Introduction

Elevated levels of pro-inflammatory cytokines are implicated in the pathogenesis of major depression and can induce symptoms known as 'sickness behaviours'[1]. This has led to the hypothesis that chronic low-grade inflammation could lead to more persistent alterations in neuropsychological function. However, the mechanisms remain unclear.

This study utilises typhoid vaccination as a model of acute inflammatory challenge, which has previously been shown to stimulate a mild, non-sickness inducing response that increases levels of the pro-inflammatory cytokine, interleukin-6 [2]. This has been shown to elicit a transient depression-like syndrome in healthy participants[2].

The primary objective is to investigate the link between inflammation and depression by looking at effects of immune system activation on sleep. A secondary objective is to see whether changes correlate with increases in inflammatory markers.

Methods

Sixteen healthy participants, 18-40 years, were randomly allocated in a double-blind, placebo-controlled, cross-over design to receive typhoid vaccination and placebo injections 1-2 weeks apart.

Participants received the injection at 1500h and completed mood questionnaires hourly for 4 hours. They were fitted with the sleep EEG equipment (Embla Titanium) and blood was taken and the serum frozen for analysis of inflammatory markers. Participants returned home to sleep and completed the LSEQ the following morning. Sleep was analysed using the REMLogic software and manually edited.

Results

The typhoid vaccine was well tolerated with mild side effects. A preliminary analysis shows that typhoid compared to placebo results in increased awakenings. Small changes in mood ratings were observed. Full analysis will be available at the meeting.

Discussion

Poor sleep is a common symptom in depression. It will be of great interest to see if changes in sleep architecture and mood correlate with increases in inflammatory markers.

1. Dowlati et.al. 2010; Biol. Psychiatry, 67, 446-57.

2. Harrison et.al. 2009; Bio.l Psychiatry, 66, 407-414.