The Effect of Opioids on Emotional Reactivity

Steven M. Savvas, BHSc (Hons)

Discipline of Pharmacology,
School of Medical Sciences, Faculty of Health Sciences
University of Adelaide

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Abstract

Though opioid users report a decrease in negative emotions after opioid administration, there has been no formal study on the effect of opioids on emotional reactivity. This thesis details a body of work using mood induction procedures on opioid maintenance treatment patients, with the main aim of determining the effect of changing plasma opioid concentrations on emotional reactivity. Secondary aims include determining the relationship between pain sensitivity and depression or anxiety in methadone maintenance patients. In the first study, 21 patients on methadone maintenance and 21 Controls were induced into elated and depressed emotional states using Velten's elation or depression induction procedures respectively. These procedures were administered at times corresponding with trough (0 hour) and peak (3 hours) plasma methadone concentrations. The response to the induction procedures were measured as emotional reactivity, using primary measures (Visual Analogue Scales) and secondary measures (Profile of Mood States scores). At 0 hour, methadone patients and Controls showed similar elation (Methadone 13.2 ± 3.1 [Mean ± SEM], Controls 14.4 ± 3.7) and depression reactivity (Methadone 23.6 ± 5.0, Controls 25.1 ± 5.0), as measured by Visual Analogue Scales. However at 3 hours, the methadone patients had significantly decreased depression (Methadone 18.5 ± 4.6, Controls 36.7 ± 5.7; p=0.021) and elation reactivity (Methadone 4.4 ± 1.9, Controls 19.0 ± 2.4; p = 0.01) compared to Controls. Methadone patients appeared to be less reactive to mood induction at times of peak plasma methadone concentration than Controls, suggesting that methadone blunts both elative and depressive emotional reactivity. Study 2 compared the effects of methadone and buprenorphine on emotional reactivity in opioid maintenance patients at steady state of dosing. 26 patients on buprenorphine maintenance, 27 patients on methadone maintenance and 27 Controls were induced into elative and depressive emotional states at either 1.5 hours or 3 hours post dose, corresponding with peak plasma buprenorphine and methadone concentrations respectively. The results show significant differences between the three groups in elation and depression reactivity scores, controlling for Beck's Depression Inventory scores. Methadone patients showed a smaller increase in elation reactivity than buprenorphine patients (Methadone 13.3 ± 3.5, Buprenorphine 25.3 ± 3.4; p = 0.015), and a smaller increase in depression reactivity than buprenorphine patients (Methadone 20.3 ± 4.3, Buprenorphine 32.3 ± 4.2; p = 0.044) and Controls (Methadone 20.3 ± 4.3, Controls 35.8 ± 4.4; p = 0.021). This demonstrates that at time of peak plasma opioid concentration, methadone maintained patients are less reactive to mood induction than buprenorphine maintained patients. Therefore only methadone blunted

elative and depressive emotional reactivity. These results have improved our understanding of the psychotropic effects of opioid maintenance drugs. The results show that methadone blunts both elation and depression emotional reactivity in opioid dependent users and can be added to the range of effects that are observable at the time of peak plasma methadone concentrations. Buprenorphine, a partial μ-opioid agonist, does not blunt emotional reactivity in buprenorphine maintained treatment patients. As emotional reactivity has consequences in social and psychological functioning, consideration of the effect of opioids on emotional processing systems may improve treatment outcome.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree. I give consent to this copy of my thesis when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968. The author acknowledges that copyright of published works contained within this thesis resides with the copyright holder(s) of those works. I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library catalogue and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

List of publications:

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