

Seeing Past the Smoke...

The effect of a ward-based smokefree initiative on clozapine serum levels in a forensic inpatient unit

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INTRODUCTION

To comply with smokefree legislation, the Waitemata District Health Board has moved to ban smoking within its mental health wards by 2010. On October the 1st 2008, the Rata Unit at the Mason Clinic was the first of these wards to go completely smokefree. Most of the fifteen clients residing on Rata suffer from severe psychotic illnesses, and therefore take clozapine as their primary antipsychotic medication. Many of these clients also smoke cigarettes. It is well known that clozapine serum levels are affected by changes in cigarette consumption due to the effects of inhaled hydrocarbons on CYP-1A2 activity. Literature reports indicate that increased clozapine serum levels of approximately 2-fold are often observed within a week of smoking cessation. Increased serum levels may in turn increase the risk of significant clozapine toxicity, including increased hypersalivation, disabling sedation, confusion and seizure activity.

OBJECTIVES

To describe changes in clozapine dose and serum levels resulting from smoking cessation in all applicable Rata clients stopping smoking from October 1st 2008. This information can then be used to make recommendations for managing clozapine-dosing for both inpatient and community-based clients.

METHODS

Clients were screened for the study criteria, which were (i) smoker at the smoking cessation date and (ii) taking clozapine. Six clients were identified. Each client had trough clozapine serum levels taken approximately 12 hours post dose at least one week prior to the smoking cessation date, and then at one week and four weeks after the smoking cessation date. All clients were also observed clinically for signs of clozapine toxicity, as clozapine serum levels often take three to four days before results are available.

RESULTS

Serum level testing in the first week post-cessation revealed a mean clozapine serum level increase of 1.70 times the baseline (see figure 1). All six clients experienced an immediate increase in clozapine serum level (median=1.72, range=1.46-1.92). Testing at four weeks post cessation showed a mean increase of 2.09 times baseline (median=1.88, range=1.48-3.38). All six clients experienced an ongoing increase in clozapine serum level, and a reduction in clozapine dose was required for five clients (see figure 2). One client was clinically observed to suffer signs of toxicity (hypersalivation and sedation) that required clozapine dose reduction prior to obtaining a serum level. These effects were observed within 3 days of cessation. This client was noted to have suffered adverse effects of a similar intensity when first initiated on clozapine. No seizure activity was witnessed in any of the clients.

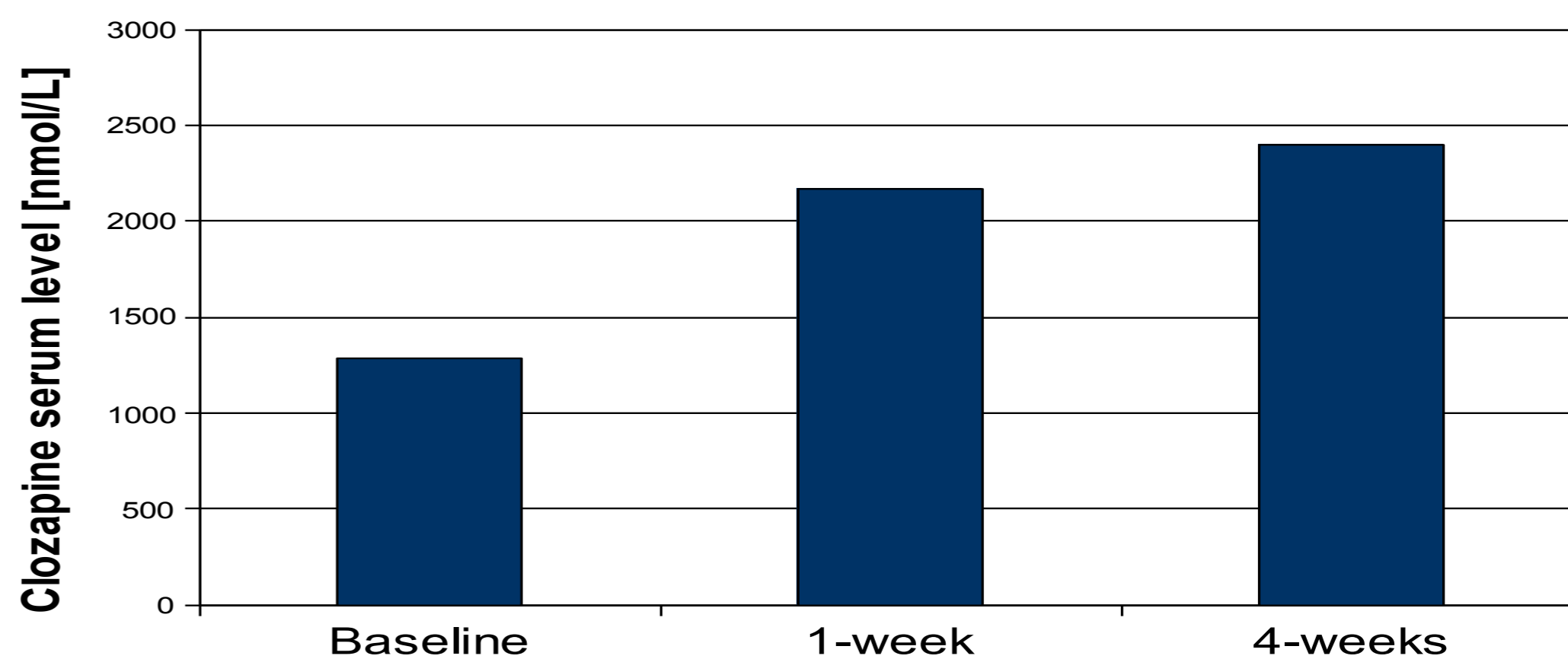


Figure 1: Mean (n=6) clozapine serum trough levels at baseline, 1-week and 4-weeks post-cessation.

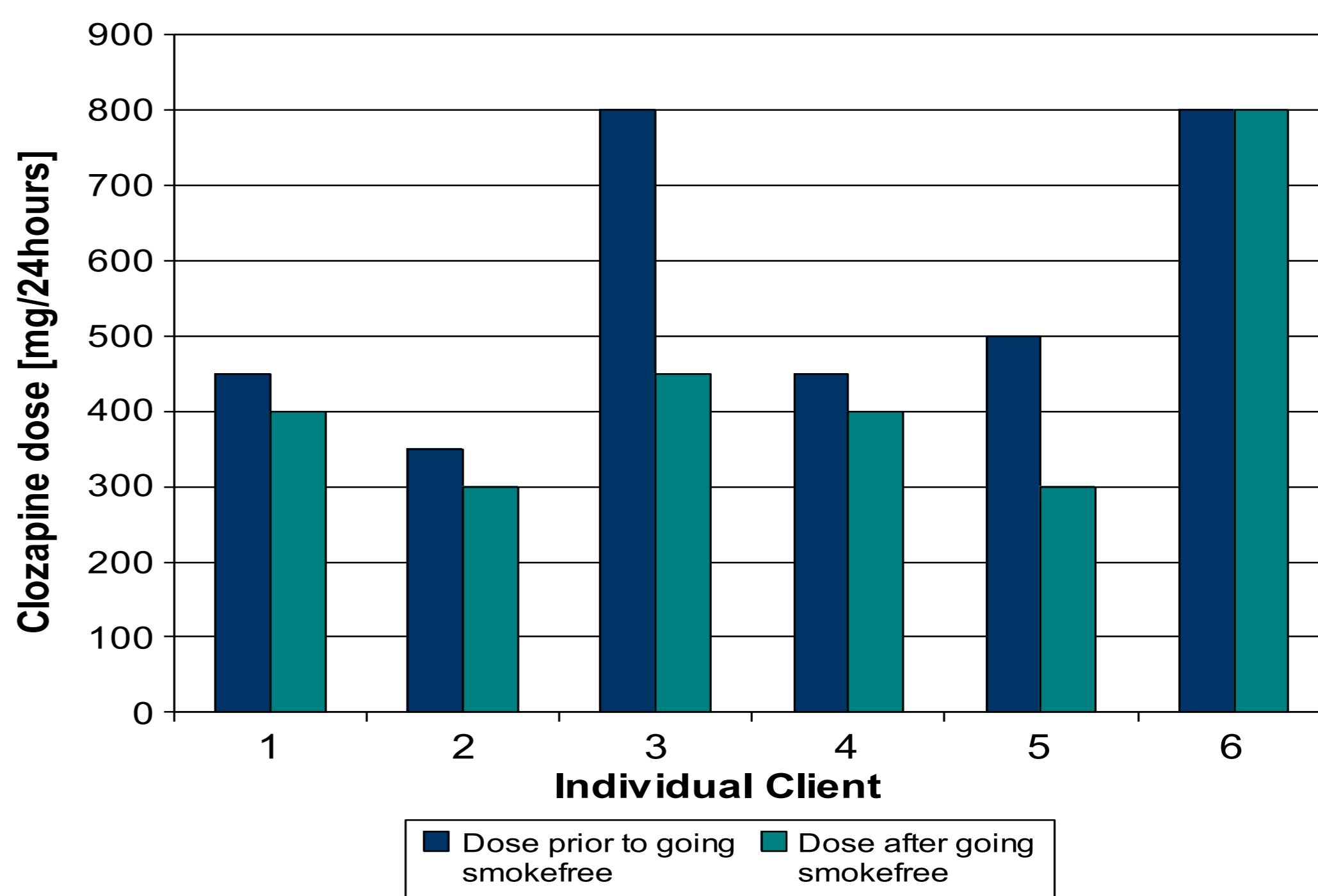


Figure 2: Dose changes for individual clients required to bring clozapine serum levels back to baseline or to within acceptable limits.

CONCLUSIONS

Clozapine serum level increases are a predictable outcome in those undertaking smoking cessation. A large degree of variability was demonstrated in our study population. Changes to clozapine serum levels required ongoing monitoring and adjustment of clozapine dose for greater than four weeks after smoking cessation.

Care is needed when clients prescribed clozapine undertake smoking cessation. Close monitoring for toxicity and serial monitoring of serum level — initially at weekly intervals — is advised. For some clients this may need to be continued for as long as six to eight weeks. Clozapine doses may require significant reduction. Clients who have had past difficulties with tolerance when first prescribed clozapine may expect a recurrence of adverse effects.

We wish to acknowledge the hard work put in by Stuart Dysart, Claire Thompson, Nikki Holmes and the Rata team in achieving a smokefree unit.