

# Screening pattern of carbamazepine level on admission to the psychiatric unit in patients receiving the medication: quality improvement project

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## Introduction

Accurate monitoring of psychotropic drugs blood level is imperative for proper clinical practice, to prevent side effects or relapse, to optimize treatment and ensure compliance. In 1995, Schoenenberger RA et al tried to develop explicit reliable criteria to decrease routine daily monitoring for anti-epileptic drugs in efforts to substantially reduce cost without missing clinical results,<sup>1</sup> so did Affolter N et al in 2003.<sup>2</sup> Both studies found that 27% and 48% -respectively- of all AED measurements had appropriate indications. The role of Therapeutic drug monitoring (TDM) of Antipsychotics and Antiepileptic drugs in Bipolar disorder was discussed and evaluated by Musenga A et al.,<sup>3</sup> in 2009 where he focuses on currently available analytical TDM methods, reviewing and discussing their advantages and limitations. In 2009 a retrospective study was designed with Sharma S et al.,<sup>4</sup> to assess the appropriateness and clinical utility of TDM at a tertiary care hospital. In 2013, Dalaklioglu S<sup>5</sup> published a study where he pointed out the need for interventions to improve the rational use of TDM, based on data from a teaching hospital in Antalya, Turkey.

A nationwide survey -the first of its kind in China- was conducted by Guo W et al.,<sup>6</sup> to assess the status and lay foundation for improvement of TDM. His result pointed out that although current equipment and analytical methods meet the TDM need, much improvement is needed, particularly in new analytical method development, interpretation of results, consultation services, and quality control. The TDM expert group of the Arbeitsgemeinschaft für Neuro-psychopharmakologie und Pharmakopsychiatrie AGNP<sup>7</sup> issued consensus guidelines for best practice of TDM in psychiatry and neurology in 2004 and an updated version in 2011. In 2015, Hiemke C suggested that TDM could become a standard of care in psychiatry and neurology and exemplified the use of TDM consensus guidelines on patients receiving antidepressants. Also in 2015, Burianová I et al., conducted a study to consider the introduction of the pharmacologically active metabolite carbamazepine-10,11-epoxide (CBZ-E) to TDM, and found it might be beneficial for patients receiving CBZ with AED.

## Objective

To evaluate the status of TDM as part of routine procedure upon admission and follow up for patients receiving Carbamazepine as a mood stabilizer or an anti-epileptic, in HMC psychiatry hospital, inpatient units.

## Method

A study of 754 patients admitted to the inpatient unit in HMC psychiatry hospital in 2012; Admission records including baseline

demographics and initial laboratory workup were reviewed retrospectively in 2013 as a part of Quality Improvement Project.

## Results

Only 83 out of the total 754 patients were taking Carbamazepine; 29 (35%) of which were not tested upon admission. 4 of the 54 who were tested had toxic levels, while 2 patients had sub therapeutic levels that would lead us to conclude that we may have potentially and mathematically missed two more patients with toxic level and another undertreated patient.

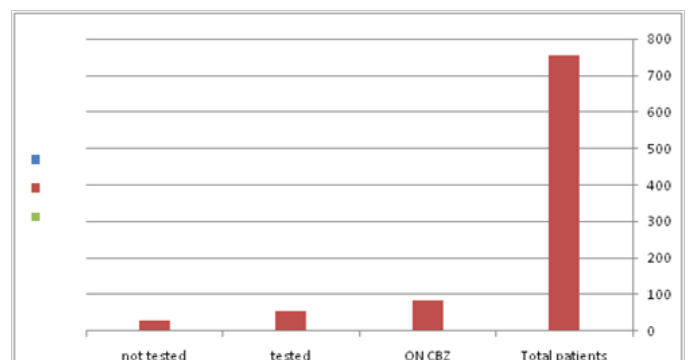


Figure 1

## Conclusion

Based on numerous international guidelines we do recommend the testing of any patient on Carbamazepine on regular intervals and on admission to psychiatric unit, furthermore, after initiating Carbamazepine, two levels should be drawn, 4 weeks apart, to establish therapeutic dosage secondary to auto-induction of the CYP450 system. CBC, LFTs, electrolytes, and renal function should be done monthly for 3 months, then repeated annually.<sup>8</sup> In the case of Asian patients (who represents about 60 to 70% of our patients pool) it is highly recommended to undergo genetic testing for the

HLA-B\*1502 whenever logistics allow it as they are at higher risk to develop Stevens- Johnson syndrome (Figure 1 & 2).

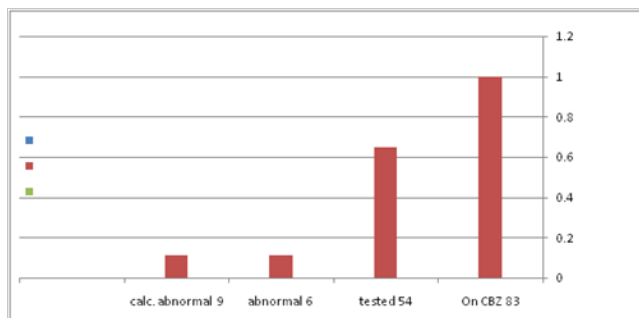


Figure 2

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None.

## Conflicts of interest

Author declares there are no conflicts of interest.

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