Introduction

A considerable interindividual variability in clinical response to psychotropic drug treatment is observed (1). As patients differ in their ability to absorb, distribute, metabolize and eliminate drugs due to genetic peculiarities, concurrent disease, age, or concomitant medication, at the very same dose a more than 20-fold interindividual variation in the medication’s steady state concentration in the body may result (2-4). Monitoring blood concentration levels of these drugs remains a valuable and essential tool for optimization of treatment with these drugs (5).

Currently in Rwanda, no determination of psychotropic drugs in patient blood is done. This makes the optimization of treatment with these drugs and exposes patients to a high risk of toxicity. This prompted us to undertake a study aiming to validate an analytical technique for the determination in serum of psychotropic drugs most commonly used in Rwanda: alprazolam, amitriptyline, bromazepam, carbamazepine, chlorpromazine, citop Lapam, clomipramine, clonazepam, diazepam, droperidol, fluoxetine, fluoxetine-phenytoin, haloperidol, imipramine, levomepromazine, lorazepam, midazolam, nordiazepam, olanzapine, phenobarbital, phenytoin, pipamperone, risperidone, sulpiride, tiapentol, zolpidem, and zuclopenthixol.

Materials and Methods

A simple and sensitive HPLC-DAD method has been validated for the determination in serum of selected psychotropic drugs. Except for haloperidol, fluoxetine and zuclopenthixol where it is only applicable for confirmation of intoxication, the method is suitable for both therapeutic drug monitoring and confirmation of intoxication. Sample analysis has shown that the risk of ineffectiveness in patients under psychotropic treatment is higher (47%) than the risk of toxicity (8%), with only 46% of results within the optimal therapeutic window. The situation is quite similar in both compared sites and this obviously demonstrates the need of therapeutic drug monitoring for these drugs in Rwanda.

Results

The developed method was linear over tested dosing intervals with coefficient of determination of at least 0.99 for all molecules. The method showed good selectivity, precision and accuracy. The RSD% and the relative bias respectively ranged from 0.5 to 13.2% and from 0.06 to 12.9%, while the recovery varied between 92.7% and 112.9%. The accuracy of the method was demonstrated over selected dosing intervals. Peaks with good resolution were obtained and hereafter some of chromatograms are presented.

Conclusion