VOLUMETRIC ABSORPTIVE MICROSAMPLING (VAMS) AS AN ALTERNATIVE TOOL FOR TACROLIMUS AND MYCOPHENOLIC ACID TDM

Paniagua-González L[1], Díaz-Louzao C[2], Lendoiro E[1], Otero-Antón E[3], Cadarso-Suárez C[2], López-Rivadulla M[1], Cruz A[1], de-Castro-Ríos A[1]

[1]Toxicology Service, Institute of Forensic Sciences, Universidade de Santiago de Compostela, Santiago de Compostela, Spain

[2]Department of Statistics, Mathematical Analysis and Optimization, Universidade de Santiago de Compostela, Santiago de Compostela, Spain

[3]Abdominal Trasplant Unit, Universitary Clinical Hospital of Santiago de Compostela, Santiago de Compostela, Spain

Background: Therapeutic drug monitoring (TDM) of immunosuppressants (IMS) is crucial to prevent rejection or toxicity after solid organ transplantation. Volumetric absorptive microsampling (VAMS) could be a good alternative to conventional venous sampling for IMS' TDM. It enables the collection of precise and accurate blood volumes, overcoming the hematocrit (Hct) effect related to dried blood spots, while offering the same benefits. In this work, the performance of Mitra™ VAMS devices as an alternative to venous whole blood (WB) for monitoring tacrolimus (TAC) and mycophenolic acid (MPA) is deeply evaluated by comparing capillary VAMS (c-VAMS), venous VAMS (v-VAMS) and WB concentrations for both analytes. **Methods:** Sixty-three and twenty-six paired c-VAMS and WB samples were obtained for TAC and MPA, respectively. To initially study the impact of the device in the results, v-VAMS were also prepared from each liquid whole blood sample. Method comparison was assessed by Passing-Bablok regression and calculating the median percentage predictive error (MPPE) and the median absolute percentage error (MAPE). Intraclass correlation index (ICC) was calculated to evaluate the correlation, and Bland-Altman plot was created to study the agreement between methods. The impact of the Hct was assessed by a linear regression analysis to describe the %concentration difference as a function of the Hct. **Results:** For TAC, Passing-Bablok regressions between WB/v-VAMS, WB/c-VAMS and v-VAMS/c-VAMS showed significant differences in all cases. Therefore, VAMS transformed concentrations were used for all. ICC indicated excellent correlations. No identifiable patterns were found in the Bland-Altman plots when using VAMS corrected concentrations, and bias results met acceptance criterion. For MPA, Passing-Bablok regression between WB/v-VAMS showed no significant differences, so no transformation was needed. Nevertheless, correction was made for WB/c-VAMS and v-VAMS/c-VAMS. ICC showed excellent correlations. No patterns were found in the Bland-Altman plots and bias results met acceptance criterion. Additionally, there was no Hct-impact on measurements between methods for neither TAC nor MPA. **Conclusions:** In this ongoing study, VAMS seems a promising tool for the TDM of both TAC and MPA, although more studies are needed in order to have enough data.

Keywords: Volumetric Absorptive Microsampling, Tacrolimus, Mycophenolic acid, TDM, Immunosuppressants