Rapid quantification of gabapentin, pregabalin and vigabatrin in human serum by UPLC-MS/MS

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Introduction: gabapentin (GBP), pregabalin (PRG) and vigabatrin (VIG) are antiepileptic drugs structurally related to γ-aminobutyric acid. For a clinical study a fast multi-component quantification method was needed.

Methods: An UPLC-MS/MS method was developed and validated for linearity, within- and between run precision and accuracy, stability, specificity and selectivity. Cross-talk, carry-over and the contribution of matrix effects on the method performance were determined.

Results: The method was linear over the range of 0.03 - 25 mg/L for gabapentin, 0.03 - 25 mg/L for pregabalin, 0.06 - 50 mg/L for vigabatrin. The between and within-run precision ranged from 90% to 107%. The between and within-run precision of the method was less than 10%. Stability data show no significant decrease of the analytes. A relative matrix effect of -1%, 0.2% and -5% was determined for GBP, PRG and VIG respectively.

Conclusion: A simple and sensitive ultra performance UPLC-MS/MS method was developed and validated for the simultaneous quantification of GBP, PRG and VIG in human serum, which provided the necessary characteristics.