

Sensitive and Inexpensive HPLC Method for Combined Monitoring of Metformin and Sitagliptin in Plasma

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SUMMARY. A simple and economical high performance liquid chromatographic method has been developed for the combined monitoring of metformin and sitagliptin in plasma on C₁₈ column ZORBAX ODS (1.5 cm × 4.6 mm, 5 μm) with UV detection at 220 nm. The expected optimal assay condition comprised of 0.01 M potassium dihydrogen phosphate and acetonitrile 45:55 % v/v at a flow rate of 1.25 mL/min. The regression values obtained from linearity curve of metformin and sitagliptin were 0.9988 and 0.9979, respectively. The retention time of metformin and sitagliptin were 3.601 and 6.253 min, respectively. The percentage recoveries of metformin and sitagliptin was ranged from 93.5 to 98.04 % and 95.0 to 98.44 %, respectively. The LOD and LOQ of metformin were found to be 1.4 and 2.9 ng/mL and LOD and LOQ of sitagliptin were 1.6 and 2.5 ng/mL. The resolution of metformin and sitagliptin were found in the range of 1.22 to 2.79 and 1.34 to 5.11, respectively. The freeze-thaw studies showed that metformin and sitagliptin in rabbit plasma sample was stable. The method can be used to analyze the metformin and sitagliptin concentration in plasma samples for bioavailability and bioequivalence studies.

RESUMEN. Se ha desarrollado un método cromatográfico líquido de alto rendimiento simple y económico para el monitoreo combinado de metformina y sitagliptina en plasma en la columna C₁₈ ZORBAX ODS (1,5 cm x 4,6 mm, 5 μm) con detección UV a 220 nm. La condición de ensayo óptima esperada comprendía 0,01 M de dihidrógeno fosfato de potasio y acetonitrilo 45:55% v/v a un caudal de 1,25 mL/min. Los valores de regresión obtenidos de la curva de linealidad de metformina y sitagliptina fueron 0.9988 y 0.9979, respectivamente. El tiempo de retención de metformina y sitagliptina fue de 3.601 y 6.253 min, respectivamente. El porcentaje de recuperación de metformina y sitagliptina osciló entre 93.5 y 98.04% y 95.0 a 98.44%, respectivamente. Se encontró que el LOD y el LOQ de la metformina eran 1.4 y 2.9 ng / mL y el LOD y el LOQ de la sitagliptina fueron 1.6 y 2.5 ng / mL. La resolución de metformina y sitagliptina se encontró en el rango de 1.22 a 2.79 y 1.34 a 5.11, respectivamente. Los estudios de congelación y descongelación mostraron que metformina y sitagliptina en muestras de plasma de conejo eran estables. El método se puede utilizar para analizar la concentración de metformina y sitagliptina en muestras de plasma para estudios de biodisponibilidad y bioequivalencia.

KEY WORDS: metformin, sitagliptin, rabbit plasma.

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