



Comparison of Vancomycin Serum Concentrations Measured by Chemiluminescent Microparticle Immunoassay (CMIA) and Liquid Chromatography-Mass Spectrometry (LC-MS/MS) in a Group of Patients with a Wide Range of Creatinine Levels

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SUMMARY. Vancomycin (VCM) is a glycopeptide antibiotic used for the treatment of infections caused by Gram-positive bacteria. Exposure of VCM molecules to body temperature lead to the formation of its crystalline degradation product, CDP-1, which cross-reacts with anti-VCM antibodies in non-specific immunoassays. VCM concentrations were measured in 187 serum samples using CMIA and LC-MS/MS assays. Samples were divided according to CRE levels. The comparability of the measurements was evaluated using statistical tools. LC-MS/MS measured levels were, on average, 6.3% higher than CMIA in quartile 1 (CRE n the range 0.32-0.59 mg/dL), and 1.0% (range 0.60-0.90 mg/dL), 8.7% (range 0.91-1.94 mg/dL), and 15.1% (range 1.98-7.13 mg/dL) lower in quartiles 2, 3, and 4, respectively. When classifying VCM concentrations as sub-therapeutic, therapeutic or supra-therapeutic, 92.5% measurements had concordant interpretations in both methods. VCM concentrations measured by CMIA and LC-MS/MS are highly correlated. However, as the CRE concentration of the sample increases, CMIA increasingly overestimates VCM concentrations.

RESUMEN. La vancomicina (VCM) es un antibiótico glicopeptídico usado para el tratamiento de infecciones causadas por bacterias Gram-positivas. La exposición de las moléculas de VCM a la temperatura corporal conduce a la formación de su producto de degradación cristalino, CDP-1, que reacciona de forma cruzada con anticuerpos anti-VCM en inmunoensayos no específicos. Las concentraciones de VCM se midieron en 187 muestras de suero usando los ensayos CMIA y LC-MS / MS. Las muestras fueron divididas de acuerdo a los niveles de CRE. La comparabilidad de las mediciones se evaluó mediante herramientas estadísticas. Los niveles medidos por LC-MS/MS fueron, en promedio, 6.3% más altos que CMIA en el cuartil 1 (CRE n el rango 0.32-0.59 mg/dL), y 1.0% (rango 0.60-0.90 mg/dL), 8.7% (rango 0.91-1.94 mg/dL), y 15.1% (rango 1.98-7.13 mg/dL) más bajo en los cuartiles 2, 3 y 4, respectivamente. Al clasificar las concentraciones de VCM como sub-terapéuticas, terapéuticas o supra-terapéuticas, el 92,5% de las mediciones tuvo interpretaciones concordantes en ambos métodos. Las concentraciones de VCM medidas por CMIA y LC-MS/MS están altamente correlacionadas. Sin embargo, a medida que aumenta la concentración de CRE de la muestra, CMIA sobreestima cada vez más las concentraciones de VCM.

KEY WORDS: chemiluminescent microparticle immunoassay, creatinine, liquid chromatography-tandem mass spectrometry, vancomycin.

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