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# VANCOMYCINE DETERMINATION IN SERUM – COMPARISON OF METHODS

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Vancomycin is a glycopeptide antibiotic used in the treatment of infections caused by numerous gram-positive bacteria, primarily *Staphylococcus aureus*, and in patients without a therapeutic response to penicillin and cephalosporins. Therapeutic serum vancomycin concentrations are 5-10 mg/L. Higher concentrations can cause serious adverse reactions such as ototoxicity and nephrotoxicity, therefore monitoring of serum vancomycin levels is essential. The aim of the paper is comparison of the results obtained by immunoenzyme assay and chromatographic method. Vancomycine was quantified in 36 serum samples using immuno enzyme essay (Emit 2000 Vancomycin Assay test), with Beckman Coulter Analyzer system and Shimadzu ultrafast liquid chromatographer with triple-quadrupole mass spectrometer (LCMS-8030). The results were statistically analyzed using SPSS 20. Samples for hromatographic analyses were prepared by protein precipitation and separation was performed on the column Kinetex C18, 1,7um, 50 x 2.1mm, termostated on 50, using mobile phase consisted of 0.1% formic acid in water (A) and 0.1% formic acid in acetonitrile (B), with 0.45 mL/min gradient flow rate. Vancomycine MRM transition in ESI (+) mode is 725.2>144. Using the student's t test, it was shown that there is no statistical difference in the results obtained by two described methods ($p=0.069 \geq 0.05$). The correlation coefficient of the obtained results is $r=0.9972$. According to the obtained results, immunoassay and chromatographic methods are reliable and are applicable to routine vancomycine monitoring.

**References**

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## ODREĐIVANJE VANKOMICINA U SERUMU – POREĐENJE METODA

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Vankomicin je glikopeptidni antibiotik koji se koristi u lečenju infekcija izazvanih brojnim gram-pozitivnim bakterijama, pre svega bakterijom *Staphylococcus aureus*, i kod pacijenata bez terapijskog odgovora na primenu penicilina i cefalosporina. Terapijske koncentracije vankomicina u serumu su 5-10 mg/L. Povišene vrednosti mogu da izazovu ozbiljna neželjena dejstva kao što su ototoksičnost i nefrotoksičnost, te je važan monitoring nivoa vankomicina u serumu. Cilj rada je poređenje koncentracija leka u serumu dobijenih primenom imunoenzimske metode za rutinsko određivanje i hromatografskom metodom. Izvršena je kvantifikacija vankomicina u 36 uzoraka seruma imuno-enzimskom metodom (Emit 2000 Vancomycin Assay test), upotrebom Beckman Coulter Analyzer sistema i tečnom hromatografijom sa triple kvadrupol masenim spektometrom (Shimadzu LCMS 8030). Rezultati su statistički obrađeni programom SPSS 20. Uzorci za hromatografsku analizu su pripremani precipitacijom proteina, a razdvajanje je izvršeno na koloni Kinetex C18, 1,7um, 50 x 2,1mm, na temperaturi od 50 °C, uz upotrebu mobilnih faza: 0,1% rastvor mravlje kiseline u vodi (A) i 0,1% rastvor mravlje kiseline u acetonitrilu (B) u gradijentnom protoku 0,45 mL/min. Praćena MRM tranzicija vankomicina u ESI (+) modu je 725,2>144. Korišćenjem Studentovog t-testa, pokazano je da ne postoji statistička značajna razlika u rezultatima dobijenim dvema opisanim metodama ($p=0,069 \geq 0,05$). Dobijeni koeficijent korelacije je $r=0,9972$. Na osnovu dobijenih rezultata, imuno-enzimska i hromatografska metoda su pouzdane i mogu se koristiti u rutinskom monitoringu vankomicina u serumu.

**Literatura**

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