



Amikacin Sulphate and Corticosteroid Admixtures: a Medication Misadventure

Naureen SHEHZADI¹, Khalid HUSSAIN^{1*}, Muhammad SALMAN¹,
Najma ARSHAD² & Muhammad T. KHAN³

¹ Punjab University College of Pharmacy, University of the Punjab,
Allama Iqbal Campus, Lahore-54000, Pakistan

² Department of Zoology, University of the Punjab, Quaid-e-Azam Campus, Lahore-54000, Pakistan

³ Faculty of Pharmacy, the University of Lahore, Off Defense Road, Lahore, Pakistan

SUMMARY. The administration of admixtures of antibiotics and corticosteroids, two magical bullets, may be a medication misadventure leading to an increased/compromised efficacy or hazardous/life-threatening response. Therefore, the present study describes the evaluation of admixtures of amikacin sulphate (AS) and dexamethasone sodium phosphate (DSP) and hydrocortisone sodium succinate (HSS) for physico-chemical and therapeutic compatibility. Physicochemical compatibility/stability was evaluated at 4 ± 2 °C, 25 ± 2 °C and 45 ± 2 °C by visual observation and colorimetric and HPLC metabolomes. The effect of steroids on antibacterial activity of AS was determined, using *Escherichia coli* (ATCC 8739). Spontaneous turbidity and precipitation indicated incompatibility of AS with HSS, whereas no physical change was noticed in AS-DSP mixtures for 12 h at all the storage conditions. However, metabolomics studies indicated that AS was not compatible/stable with both the steroids. The antibacterial activity of AS (MIC = 6.25 µg/mL) was found to be decreased in both admixtures (MIC = 12.50 µg/mL). The results of the present study indicate that amikacin sulphate should not be admixed with dexamethasone sodium phosphate or hydrocortisone sodium succinate prior to administration.

RESUMEN. La administración de aditivos de antibióticos y corticosteroides, dos balas mágicas, puede ser una desventaja de la medicación que conduce a una eficacia aumentada/comprometida o a una respuesta peligrosa/potencialmente mortal. Por lo tanto, el presente estudio describe la evaluación de las mezclas de sulfato de amikacina (AS) y fosfato de dexametasona sódica (DSP) y succinato de sodio de hidrocortisona (HSS) para determinar su compatibilidad fisicoquímica y terapéutica. La compatibilidad fisicoquímica/estabilidad se evaluó a 4 ± 2 °C, 25 ± 2 °C y 45 ± 2 °C mediante observación visual y metabolitos colorimétricos y de HPLC. Se determinó el efecto de los esteroides sobre la actividad antibacteriana de AS, utilizando *Escherichia coli* (ATCC 8739). La turbidez espontánea y la precipitación indicaron incompatibilidad de AS con HSS, mientras que no se observó cambio físico en las mezclas AS-DSP durante 12 h en todas las condiciones de almacenamiento. Sin embargo, los estudios de metabolómica indicaron que el AS no era compatible/estable con ambos esteroides. Se encontró que la actividad antibacteriana de AS (MIC = 6,25 µg/mL) disminuyó en ambas mezclas (MIC = 12,50 µg/mL). Los resultados del presente estudio indican que el sulfato de amikacina no debe mezclarse con fosfato sódico de dexametasona o succinato sódico de hidrocortisona antes de la administración.

KEY WORDS: amikacin sulphate, antibacterial studies, compatibility, corticosteroids, efficacy, metabolomics.

* Author to whom correspondence should be addressed. E-mail: hussain_761@yahoo.com, khussain.pharmacy@pu.edu.pk