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Reversal of P-Glycoprotein Mediated Resistance in *Pseudomonas aeruginosa* and *Escherichia coli* by Various Agents

Farheen TAIMOOR[1], Uzma SALEEM[2], Fareeha ANWAR[1], Bashir AHMAD[1], Tariq ISMAIL[3], Abid HUSSAIN[4], Fahad Said KHAN[4], Muhammad AKHLAQ[5,*], Muhammad AKRAM[6] & Aisha SIDDIQUA[7]

[1] *Riphah Institute of Pharmaceutical Sciences, Riphah International University, Lahore Campus, Lahore, Pakistan*
[2] *Government college (GC) University, Faculty of pharmacy, Faisalabad, Pakistan*
[3] *Department of Pharmaceutical Sciences, COMSATS, Abbottabad, Pakistan*
[4] *Faculty of Medical and Health Sciences, University of Poonch, Rawalakot, AJK, Pakistan*
[5] *Department of Pharmaceutics, Faculty of Pharmacy, Gomal University, DIK, KPK, Pakistan*
[6] *Department of Eastern Medicine, Directorate of Medical Sciences, Government College University Faisalabad, Pakistan*
[7] *Gomal Center of Biochemistry and Biotechnology, Gomal University, DIK, KPK, Pakistan*

SUMMARY. **Different classes of drugs which are known as permeability glycoprotein (P-glycoprotein) inhibitors have ability to reverse P-glycoprotein mediated resistance in bacteria. In this study, the effects of antibiotics alone and then in combination with different p-glycoprotein inhibitors was observed to analyze the reversal of resistance caused by P-glycoprotein. Three fluoro-quinolones, nalidixic acid, clarithromycin and penicillin G were used as antibiotics, and verapamil, tamoxifen, glybenclamide, sertraline and paroxetine were used as p-glycoprotein inhibitors. Resistant strains of *Pseudomonas aeruginosa* and *Escherichia coli* were used as test microbes. The effects of p-glycoprotein inhibitors were observed by measuring the increase in zone of inhibition. The disc diffusion method was used. Main focus was on the active efflux resistance which played a major role in many species of bacteria. Results showed that inhibition of efflux pumps by an efflux pump inhibitor would restore the activity of an agent subject to efflux P-glycoprotein inhibitors. It was concluded that p-glycoprotein inhibitors increased the zone of inhibition of antibiotics.**

RESUMEN. Las diferentes clases de fármacos que se conocen como inhibidores de la glucoproteína de permeabilidad (glicoproteína P) tienen la capacidad de revertir la resistencia mediada por la glicoproteína P en las bacterias. En este estudio se observaron los efectos de los antibióticos solos y luego en combinación con diferentes inhibidores de la glucoproteína P para analizar la reversión de la resistencia causada por la glicoproteína P. Se utilizaron tres fluoroquinolonas, ácido nalidíxico, claritromicina y penicilina G como antibióticos y verapamil, tamoxifeno, glibenclamida, sertralina y paroxetina como inhibidores de la glicoproteína P. Cepas resistentes de *Pseudomonas aeruginosa* y *Escherichia coli* se utilizaron como microbios de prueba. Los efectos de los inhibidores de la glicoproteína P se observaron midiendo el aumento en la zona de inhibición. Se utilizó el método de difusión discal. El enfoque principal se centró en la resistencia activa al flujo de salida que jugó un papel importante en muchas especies de bacterias. Los resultados mostraron que la inhibición de las bombas de flujo de salida por un inhibidor de la bomba de flujo de salida restablecería la actividad de un agente sujeto al flujo de salida de inhibidores de la glicoproteína P. Se concluyó que los inhibidores de la glicoproteína P aumentaron la zona de inhibición de los antibióticos.

KEY WORDS: Escherichia coli, glybenclamide, *Pseudomonas aeruginosa*, sertraline, tamoxifen, verapamil.

* Author to whom correspondence should be addressed. *E-mail:* dr.akhlaq@gu.edu.pk

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