Cost-Effectiveness of Minocycline Intravenous for the Treatment of Serious Infections Due to Multidrug-Resistant Acinetobacter baumannii in Jordan

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Introduction

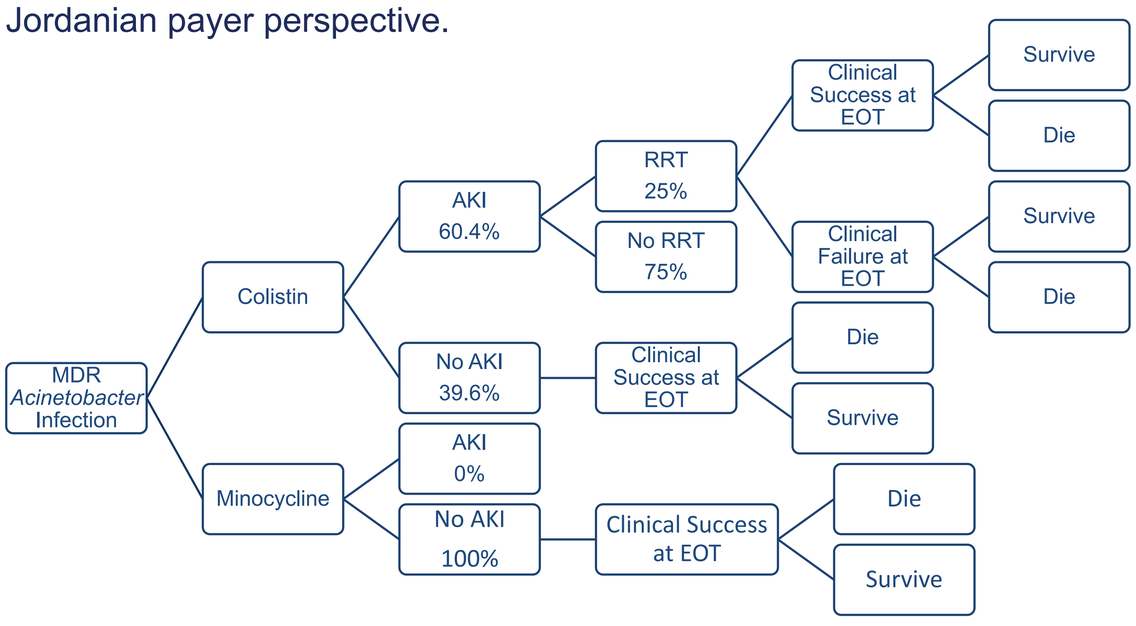
Acinetobacter baumannii is one of the most critical multidrug-resistant (MDR) pathogens in healthcare settings globally, with rising resistance to commonly used antibiotics. Intravenous (IV) minocycline has demonstrated clinical efficacy and favorable safety profile for the treatment of infections caused by MDR *A.baumannii*.

Objective

This study assesses the cost-effectiveness of IV minocycline versus IV colistin in treating MDR A. baumannii infections in Jordan.

Method

A 28-day decision-tree model was developed to evaluate the cost-effectiveness of IV minocycline compared to IV colistin for the treatment of MDR Acinetobacter baumannii infections from a Jordanian payer perspective.



*AKI: Acute Kidney Injury, RRT: Renal Replacement Therapy, EOT: End of Treatment

Drug prices were sourced from Jordanian Food and Drug Administration. Local resource utilization costs were estimated from four private hospitals in Amman, Jordan.

Medication	Strength	Presentation	Public Price without tax
Minocycline IV	100mg	1 vial	JOD 24.8
Colismethane sodium (Average Price)	1 Million Units	1 vial	JOD 6.06

Local resource utilization costs were estimated from four private hospitals in Amman, Jordan.

Input	Cost (JOD)
Cost of IV administration (per 1 session)	JOD 24.8
Cost of 1 hospital stay (per 1 night)	JOD 70.0
Cost of Physician fee (per 1 visit)	JOD 50.0
Cost of 1 dialysis session	JOD 140.0

Direct medical costs included drug acquisition, IV administration, hospitalization, medical consultation, nephrotoxicity management and acute renal failure(ARF) requiring dialysis.

Direct medical costs are illustrated in the table below:

Medication	Duration of therapy (days)	Cost of Drug Acquisition (JOD)	Cost of IV Administration (JOD)	Cost of Adverse effects (Nephrotoxicity-No RRT)	Cost of Adverse effects (Nephrotoxicity-RRT)	Cost of hospitalization (JOD)	Cost of Medical Consultation (JOD)	Total Cost (JOD)
Minocycline	10	JOD 496.00	JOD 380.00	JOD -	JOD -	JOD 1,100.00	JOD 500.00	JOD 2,476.00
Colistimethane sodium	10	JOD 545.40	JOD 380.00	JOD 169.42	JOD 162.17	JOD 1,100.00	JOD 500.00	JOD 2,857.00

The model incorporated the rates of cure, mortality, nephrotoxicity and ARF requiring dialysis for both treatment arms, dose adjustment in case of acute renal failure and treatment regimen modification in case of initial therapy failure as demonstrated in the decision tree.

Results

Total treatment costs were 3,316.34 Jordanian Dinar (JOD) for minocycline and 4,827.98 JOD for colistin. Estimated QALYs were 0.2148 for minocycline and 0.1523 for colistin.

Minocycline Versus Colistin for the treatment of MDR *A.baumannii* infections in Jordan	
Difference in Cost (JOD)	JOD -1,511.64
Difference in QALYs	0.0625
ICER (JOD/QALY gained)	JOD -24,159.70 (Dominant Strategy)

DSA demonstrated that the results were robust to changes in input parameters. The model was most sensitive to changes in mortality rates associated with both treatments.

Conclusion

IV minocycline is a dominant treatment option for MDR A. baumannii infections in Jordan. These findings may support clinicians and healthcare decision-makers in prescribing cost-effective therapies, contributing to more efficient allocation of healthcare resources.

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