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Case Report

A Case Report on Polymyxin B Induced Hypotension: A Rare Emerging Catastrophe

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Abstract

Polymyxins are a group of bactericidal antibiotics discovered from different species of *Paenibacillus polymyxa* in 1947. These antibiotics have been reintroduced as a last-resort therapy due to the rise in infections caused by multidrug resistant organisms (MDRO) gram negative bacteria and the scarcity of new antibiotics to address them. Spectrum of activity includes various gram-negative organisms including *Klebsiella spp., Enterobacter spp., Pseudomonas aeruginosa, Acinetobacter spp., Escherichia coli, Salmonella spp., Shigella spp., Citrobacter spp*. Earlier findings illustrate that nephrotoxicity and neurotoxicity are the most prevalent side effects associated with polymyxin B, whereas cardiovascular toxicity is rare according to current knowledge. We describe here in a very unusual case of Polymyxin B induced hypotension.

Keywords: Polymyxin B; Hypotension

Case Presentation

A 56 years old female, with no known comorbidities was brought to the hospital Emergency Department (ED) with 2 days history of fever, breathlessness and productive cough. She was referred from a rural hospital after the initial conservative management in view of worsening symptoms [1]. On arrival to ED, she was febrile (101.8°F), hypertensive (initial blood pressure 150/70 mmHg), with a heart rate of 104 bpm, and a respiratory rate of 28 inhalations/min & SpO_2 84% (qSOFA score 2). In view of worsening Arterial Blood Gas (ABG) levels, viral ARDs evident on the chest x-ray, she was intubated and nasal swab was sent for H1N1 screening. She was then transferred to ICU with a diagnosis of viral ARDs. Treatment was promptly initiated with Inj. Methylprednisolone 125 mg BD, Inj. Clexane 06ml OD, Inj. Pantoprazole 40 mg OD, Tab. Clopidogrel 75 mg OD, Tab. Atorvastation 40 mg OD, alongside prophylactic antibiotic coverage with Tab. Oseltamivir 75 mg BD & Inj. Meropenem 1 gm Q8H. Her bronchial wash culture sensitivity report revealed MDRO Klebsiella pneumonia sensitive to only polymyxins B, However, due to financial constraints and culture report, Polymyxin B was escalated and Meropenem was deescalated [2]. She was started on Polymyxin B with the loading 15 lacs/IU diluted in 300 ml 5% dextrose and infused over 3 hours. Ten minutes after initiating infusion through the central line, her Blood Pressure (BP) unexpectedly decreased from 140/80mmHg to 85/70 mmHg. The infusion was promptly halted due to this unanticipated reaction, and we monitored her until her BP began to stabilize. The infusion was resumed at a slower rate, but unfortunately, her BP dropped again to 90/50 mmHg. Rechallenging in this scenario was deemed problematic, so we chose to initiate a new regimen. The patient was in observation in hospital for 17 days and discharged in a hemodynamically stable condition [3,4].

Discussion

The proposed hypothesis regarding for the cardiovascular effects of polymyxin B is assumed due to neuromuscular block i.e.1) At presynaptic level it decreases the release of acetylcholine and at postsynaptic levels it blocks the release of acetylcholine from the receptor channels leading to significant effect on the action potential of nervous and muscle tissue and it can also non-competitively antagonise the acetylcholine active channels on the endplates of post synaptic junction and alter the levels of acetylcholine. 2) The other possible mechanism for cardiovascular effects of Polymyxin B is assumed due to prolonged depolarisation phase secondary to calcium depletion caused by Polymyxin B, or histamine release causing systemic vasodilation and hypotension (Figure 1).

Conclusion

Polymyxins B induced hypotension, though relatively rare, is a significant clinical condition. The mechanism behind this hypotension includes histamine release causing systemic vasodilation and hypotension. With the rise of MDRO, the usage of Polymyxin B is expected to rise in the future. It is Imperative that all health care professionals who either prescribes or care for patients receiving polymyxin B be aware of their toxic effects and remains vigilant. As MDRO continues to increase the use of polymyxins to combat these infections is likely to become even more widespread.

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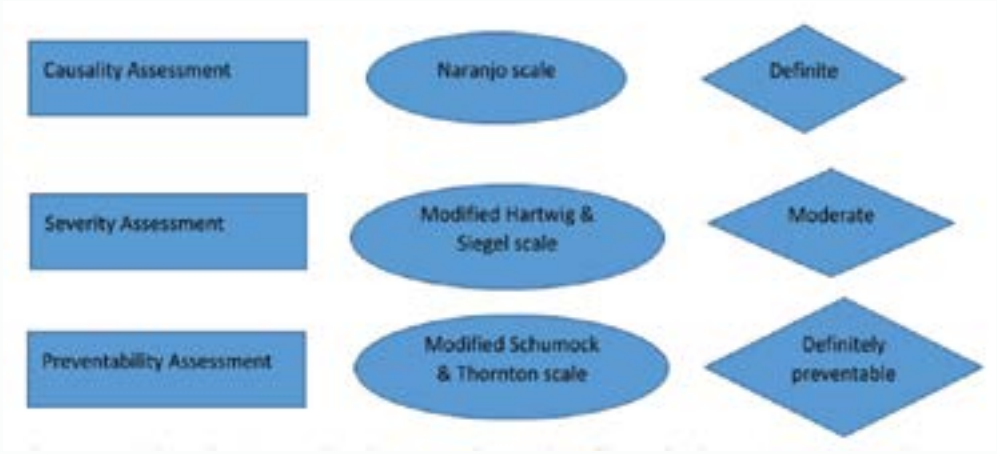

Figure 1: Hypothesis for the cardiovascular effects of polymyxin B.