Introduction

Acute Kidney Injury (AKI), also termed as acute renal failure or acute renal insufficiency, is a condition of abrupt renal function deterioration based on depletion of renal creatinine clearance with reduced renal output. AKI is associated with increased rate of mortality and complications in patients' disease states and associated therapeutics [1]. In hospital settings, 20% AKI episodes are occurred by drugs and in adult patients, 66% drug-induced AKI incidences were recorded [2,3]. Azithromycin is a broad-spectrum antibiotic of macrolide class and indicated in common bacterial infections mostly in upper and lower respiratory tracts, and also in sexually transmitted diseases [4]. Worldwide, azithromycin as a well-tolerated drug, prescribed for both children and adults. Acute nephrotoxicity due to azithromycin in different age groups is a very unusual context and this is a rare Adverse Drug Reaction (ADR) criterion of azithromycin [5]. In this case, we found an azithromycin-induced AKI event in an elderly patient.

Case Presentation

A 76-year old patient came to our hospital because of his history of breathing difficulty with wheezing, tightness of the chest and low grade fever. He had previous history of Chronic Obstructive Pulmonary Diseases (COPD), diabetes mellitus, hypothyroidism and systemic hypertension. He was admitted at general Intensive Care Unit (ICU). On the admission day, his urine output was normal with normal serum creatinine level, but there was no history of defecation in the last 48 hrs before admission. On the second day of ICU-admission, as a prokinetic agent, a single dose of injection azithromycin (1 g, intravenously) was administered to him. On the following day, his serum creatinine level was raised sharply (2.1 mg/dL) and renal output reduced to 27 mL/hr. Azithromycin was suspected for that event and stopped immediately. On the next day, his serum creatinine level was reduced remarkable (1.2 mg/dL) and urine output was normalized (45 mL/hr).

Conclusion: Nephrotoxic drugs generally contribute in developing AKI but to date, azithromycin is considered as a safe drug. However, azithromycin-induced AKI is an unusual event and caution should be taken in use.

Keywords: Acute kidney injury; Azithromycin; Nephrotoxic drugs
For this hyperthermia management, he was treated with injection acetaminophen (1 g, intravenously, 8-hourly). He also received human albumin (25%/100 mL, intravenously, 12-hourly), Levosulbutamol/Ipratropium nebulization, Levotyrothin (50 μg, orally, 24-hourly) and amlodipine/atenolol (50 mg/5 mg, orally, 24-hourly). On his second day of admission, there was no significant change in his biochemical test reports. On that day, as a prokinetic agent, he was administered with a single dose of injection azithromycin (1 g, intravenously). On the next day, there was no significant change observed in his biochemical test reports but the serum creatinine level was abruptly raised to 2.1 mg/dL. Urine output was reduced to 27 mL/hr and AKI was determined. The only newly added azithromycin was suspected for this adverse event and stopped. On the next day, his serum creatinine level was reduced to 1.2 mg/dL and urine output again increased to 45 mL/hr. During the rest of his ICU stay time, he was not experienced with AKI again. No other drug’s involvement was observed to that AKI event except azithromycin [6].

Description

ADR is an unpleasant medication-associated injury that can be developed with the regular dose of a prescribed medication and AKI is one of the most common consequences of ADR [5]. AKI is associated with increased mortality rates range between 25-80 percent and anomalous treatment outcomes [1,7]. Multifactorial causes are the basis of developing AKI events and additionally, several known and unknown patient-specific factors contribute in developing AKI. Drug-induced AKI is a common phenomenon for some drugs such as, Non-steroidal Anti-inflammatory Drugs (NSAID), several antimicrobials and different chemotherapeutic agents [1]. Multiple studies found that a drug becomes nephrotoxic with its one or more pathogenic mechanisms and these may include inflammation, tubular cell toxicity, altered intraglomerular hemodynamics, thrombotic microangiopathy and crystal nephropathy. However, the drug-specific mechanisms are very crucial to recognize and to identify the real facts behind an event [2]. Patient-oriented risk factors sometimes enhance the possibility of developing AKI and these may include age over 60 years; diseases such as, diabetes, heart failure, septic shock, volume depletion and underlying renal insufficiency [3]. In case of admitted patients, a sudden raise in serum creatinine level within 48 hours indicates a predisposition to AKI which is completely justified by its definition. To identify an AKI event, the most popular method is to compare the previous serum creatinine level with the current serum creatinine level and this also express the duration as well as the intensity of an AKI event [7].

Azithromycin is considered as one of the safe antibiotics of the macrolide group and because of having broad spectrum coverage with good patient-safety profile, azithromycin was the best-selling antibiotic in the United States in 2012 according to IMS Institute for Health Informatics market data [4].

In spite of having efficient therapeutic outcomes of azithromycin worldwide, study found that azithromycin causes interstitial nephritis and this may be resulted in persistent renal injury [5]. In this case, we found that administration of azithromycin resulted in increased serum creatinine level which clearly identified an AKI event, and later on, in a reversible manner, serum creatinine level reduced to the normal level just after discontinuing azithromycin and restored the kidney functions again. In our case, we assume that azithromycin played one or more notorious mechanism(s) in that elderly patient. We believe that some further studies are also required to evaluate the potentiality of azithromycin to develop AKI with or without one or multiple risk factors.

Conclusion

Azithromycin is a well established drug of choice in the treatment of respiratory tract infection. However, in elderly patient as one of the patient-associated risk factors, azithromycin may develop a reversible acute kidney injury. The complete mechanism behind this adverse event is still unclear but some studies justified it as azithromycin-induced interstitial nephritis. So, patient-monitoring should be performed carefully when using azithromycin specially, in elderly patients.

References