Case Report

Levofloxacin-induced Hypoglycemia in elderly: A Rare but Life-threatening Side Effect of a Widely Used Antibiotic - A Case Report

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Abstract

Levofloxacin is one of the most commonly prescribed antimicrobial agents. However, hypoglycemia due to levofloxacin in elderly is a rarely reported complication and, to our knowledge, only few cases have been published. As it is given in intravenous form in various doses and now days the drug doses been increased so one should be careful using this drug. Elderly patients have associated disease like diabetes, kidney disease and liver disease which may prone to accelerate its effect. We report this rare case of an uncommon but potentially fatal side effect of levofloxacin. This report highlights the importance of recognizing levofloxacin as a potential trigger for hypoglycemia, especially in individuals with preexisting diabetes.

Introduction

Levofloxacin, a fluoroquinolone antibiotic, is widely used for the treatment of various bacterial infections. While its safety profile is generally favorable, rare adverse effects have been reported. We present a case of recurrent hypoglycemia associated with levofloxacin use in a patient with diabetes mellitus.

Case Presentation

A 87-year-old female with type 2 diabetes on metformin, chronic obstructive pulmonary disease, hypertension, presented with a 5 days history of cough, worsening dyspnea, and acute renal failure with an estimated creatinine clearance of 25.1 mL/min. Her management and treatment strategies included the use of diuretics, corticosteroids (100 mg of intravenous hydrocortisone 8hourly daily), and levofloxacin (500 mg intravenously once daily). The last dose of metformin was given 8 hours before the first dose of levofloxacin. The following day the patient experienced multiple episodes of hypoglycemia (capillary glucose of 50 to 35 mg/dL) that were treated with repeated doses of 50-100 ml of intravenous 50% dextrose. In the next 72 hours, due to persistent hypoglycemia, the patient received multiple infusions of 50% dextrose, and dextrose-containing fluids (10% dextrose infusion) with oral glucose solution. On the fourth day, levofloxacin was discontinued and the patient continued to receive the D5 intravenous infusion. After which we noticed the patient's glycemic values gradually returned to her baseline. Serum insulin levels sent during an episode of hypoglycemia revealed unsuppressed values (77 IU/mL), suggesting hyperinsulinemic hypoglycemia.

Discussion

Several articles have associated the administration of fluoroquinolones, especially gatifloxacin, with alterations in glucose metabolism.[1] However, contrary to other quinolones, there are no randomized controlled trials assessing the incidence of hypoglycemia with levofloxacin. Levofloxacin has been previously reported to cause hypoglycemia in 7 patients.[2-3] In 4 of these instances, delays in recognizing the etiology of the hypoglycemia led to unfortunate consequences.[4-5] The persistent and severe hypoglycemia over 6 days, the lack of response to a dextrose infusion despite the fact that the patient was on steroids, and the elevated serum insulin levels despite low blood sugar values imply a different mechanism for hypoglycemia other than a combination of risk factors such as renal failure, hepatic dysfunction, and therapy with glucose-lowering medications. Application of the Naranjo adverse drug reaction probability scale to this case determined that the hypoglycemia was possibly due to levofloxacin.[6]

The inappropriately uninhibited levels of insulin in our case were consistent with an effect of levofloxacin on beta cell function and data from animal studies that have demonstrated that fluoroquinolones directly stimulate insulin secretion from pancreatic B-cells.[7]

Despite the frequent use of levofloxacin, awareness about the potential hypoglycemic effect is poor. In a recent survey, 80.4% of physicians were unaware that levofloxacin could cause hypoglycemia.[5] We describe the eighth case of hypoglycemia associated with levofloxacin. Interestingly, the diabetic patient in our case had severe and persistent hypoglycemia despite the fact that she also was receiving a high dose of corticosteroids for treatment of acute exacerbation of COPD. To the best of our knowledge, this is the first published case of such severe and persistent hypoglycemia caused by levofloxacin in a diabetic patient being treated with a combination of high dose of corticosteroids and continuous infusion of intravenous dextrose.

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Conclusion

Hypoglycemia associated with the use of levofloxacin is an uncommon occurrence but can be very persistent and severe and often responds only to discontinuation of levofloxacin. Increased awareness can prevent significant mortality and morbidity associated with this rare but life-threatening side effect of this widely used antibiotic.

References

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