

Quinolone-induced Hypoglycemia: A Life-threatening but Potentially Reversible Side Effect

To the Editor:

Quinolones are some of the most commonly prescribed antimicrobial agents and have been shown to cause alterations in glucose metabolism.¹ We recently reported the eighth case of levofloxacin-induced hypoglycemia, which is an uncommon but potentially fatal side effect of this antibiotic.¹ Our patient was readmitted with severe hypoglycemia caused by 1 dose of ciprofloxacin in combination with glipizide. This was the second episode of severe life-threatening hypoglycemia precipitated by the use of quinolone in our patient. This hypoglycemia was successfully reversed with the use of octreotide.

CASE REPORT

A 65-year-old woman with type 2 diabetes (treated with glipizide), chronic kidney disease, and cirrhosis was prescribed oral ciprofloxacin (250 mg orally twice per day) for symptoms of urinary tract infection. She had been admitted to the hospital 2 months before this presentation for severe hypoglycemia induced by levofloxacin.¹ The last dose of glipizide (5 mg) was given 6 hours before the first dose of ciprofloxacin. A few hours after the dose of ciprofloxacin, the patient developed seizures and was found to have a glucose level of 20 mg/dL. She was admitted to the hospital and received repeated doses of intravenous administration of 50% dextrose and 10% dextrose infusion. The patient had a similar presentation in the past¹ with persistent hypoglycemia (capillary glycemia < 50 mg/dL) despite treatment. Serum insulin levels revealed unsuppressed values (103 microIU/mL) and extremely elevated C peptide levels (5940 pmol/L, upper normal limit < 1400 pmol/L), suggesting hyperinsulinemic hypoglycemia. Because of the severity of presentation and the known history, 50 µg octreotide was

administered intravenously 36 hours after presentation in an attempt to suppress the hyperinsulinemia. Her glucose levels normalized within 2 hours after the administration of octreotide and remained elevated (>200 mg/mL). The patient had a complicated hospital course secondary to arrhythmias and aspiration pneumonia, and she was discharged to a rehabilitation facility on a sliding insulin scale.

DISCUSSION

Fluoroquinolones have been shown to cause hypoglycemia.¹ As we have shown previously, the hypoglycemia in this case was due to the use of quinolones, and the inappropriately uninhibited levels of insulin and c-peptide supported the diagnosis.¹ The patient had no prior episodes of severe hypoglycemia while taking the same sulfonylurea regimen with equivalent renal and hepatic function and developed severe hypoglycemia when a sulfonylurea in combination with a quinolone was given. Although the exact cause of drug-induced hypoglycemia cannot be identified in many cases,² application of the Naranjo adverse drug reaction probability scale to this case determined that the hypoglycemia was possibly due to ciprofloxacin. This case indicates that hypoglycemia induced by quinolones is a class side effect of these antibiotics because both levofloxacin and ciprofloxacin caused severe hypoglycemia. Notably, a single low dose of oral ciprofloxacin (in combination with sulfonylurea) led to severe and life-threatening hypoglycemia that was manifested with seizures. The severe hypoglycemia was reversed with the use of a single dose of intravenous octreotide.

Retrospective studies and a recent prospective randomized placebo-controlled study have indicated that octreotide may play a central role in the management of severe sulfonylurea-induced hypoglycemia.³⁻⁵ To the best of our knowledge, this is the first published case of severe and persistent hypoglycemia caused by quinolones in combination with sulfonylureas that was reversed with use of octreotide.

CONCLUSIONS

Hypoglycemia associated with the use of quinolones can be persistent and severe and often responds only to discontinuation of quinolones. However, use of octreotide may quickly reverse severe hypoglycemia in these cases.

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