

# Gatifloxacin Induced Abnormalities in Glucose Homeostasis in a Patient on Glimepiride

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## Abstract

Gatifloxacin, a commonly prescribed antimicrobial can produce profound hypoglycemia and disturbances in glucose homeostasis especially in diabetes patients on sulphonylureas. Also new onset disturbances in glucose homeostasis can occur in patients who were unaffected by the previous use of gatifloxacin. Therefore it is suggested that gatifloxacin is better avoided in patients with diabetes and in the elderly. ©

## INTRODUCTION

Gatifloxacin, an 8 methoxy fluoroquinolone is a commonly prescribed anti-microbial by the general practitioners and physicians for the treatment of various respiratory tract infections. The total bacterial cure rate and eradication rate of gatifloxacin in clinical studies are 91.1% and 93.3% respectively.<sup>1</sup> Gatifloxacin is considered to be a relatively safe drug without too much adverse effect. However there are reports of gatifloxacin induced hypoglycemia and hyperglycemia in diabetic as well as non-diabetic patients.<sup>2,3</sup> Here we report a case of severe hypoglycemia followed by severe and persistent hyperglycemia induced by gatifloxacin in a diabetic patient who was previously metabolically stable with glimepiride and metformin.

## CASE REPORT

A 55-year-old lady, known asthmatic for 25 years and diabetic for 4 years has been on regular follow up in our clinic since last 3 years. Her usual medications include a combination of inhalation salmeterol 25 mcg + fluticasone 125 mcg BD, inhalation tiotropium bromide 18 mcg OD, a fixed drug combination of glimepiride 1 mg + metformin 500 mg BD and atorvastatin 10 mg OD. She was under intensive metabolic management with regular home glucose monitoring and her HbA<sub>1c</sub> values of the past one-year ranged between 6.5-7%.

Few days back she visited our clinic with complaints of mild fever and productive cough for one week. She was put on oral gatifloxacin 200 mg BD for 5 days along

with her usual medications. Her inhaled medicines for asthma were also modified. Next day early morning at around 2.00 am, her husband was awakened to realize that she was in a state of discomfort with profound sweating and not responding to verbal commands. As the couple was well educated on the clinical features of hypoglycemia, her blood glucose was immediately estimated and found to be 32 mg%. She was rushed to a nearby doctor who administered intravenous betamethasone 4 cc and 25% dextrose 10 cc. She became conscious soon and when the blood glucose was measured again it was found to be 60 mg%. She continued her full course of gatifloxacin therapy without any similar attacks of hypoglycemia.

The patient did not report back to our clinic until when she noticed that her blood glucose values were abnormality high during the days of gatifloxacin therapy. Two-hour post meal glucose values on the next 4 days were found to be 316 mg%, 423 mg%, 508 mg% and 446mg% respectively. However without any further modification of anti-diabetic therapy, her blood glucose values touched normal within 2-3 days after completion of gatifloxacin therapy.

## DISCUSSION

Gatifloxacin is considered to be a safe and effective antibiotic. However, there are reports of gatifloxacin induced abnormalities in glucose metabolism.<sup>2,3</sup> But till date there is no published literature from India on this association. Since gatifloxacin is a very commonly used antibiotic, professionals and patients should be aware of its serious consequences. The temporal relation between gatifloxacin administration and the development of subsequent glucose homeostasis abnormality in our patient, point towards gatifloxacin as the cause. The patient had stable blood glucose values for the past 2 years that was evident from her HbA<sub>1c</sub> values. She had

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neither experienced such a hypoglycemic episode in the past nor had abnormally high glucose values like that occurred during the period of gatifloxacin therapy. She experienced the hypoglycemic episode within a few hours after the intake of first dose of gatifloxacin and the glucose homeostasis abnormalities persisted until the withdrawal of gatifloxacin. Moreover she had her usual meals and snacks on the day of hypoglycemia which rules out the chance of missed meals as the etiology of hypoglycemia. But the most interesting fact is that this patient had well tolerated a 5-day course of gatifloxacin a year ago while she was on the same anti-diabetic medications.

The exact etiology of gatifloxacin interaction to produce glucose disturbances is not yet clear. Certain studies describe that gatifloxacin can stimulate insulin secretion by inhibiting potassium dependent ATP channels which may be the reason for hypoglycemia.<sup>4</sup> Moreover data from certain other studies reveals that unlike levofloxacin, gatifloxacin is found to reduce both blood glucose and plasma insulin levels in a dose dependent manner in experimental animals.<sup>5</sup>

Gatifloxacin is renally excreted and high serum concentration will remain in the elderly due to age related decline in renal function.<sup>4</sup> In animal studies the propensity of gatifloxacin for insulin release was related to its high serum concentration. Hence, we suggest gatifloxacin is better avoided not only in patients with diabetes but also in all elderly individuals.<sup>6</sup>

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#### Announcement

**Bihar Chapter API Conference (BAPICON - 2007) will be held on 17th and 18th March 2007 at Jawahar Lal Nehru Medical College Campus, Bhagalpur.**

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