**HISTORY AND DIAGNOSTICS**

**TB treatment history:**
The patient was diagnosed with pulmonary tuberculosis two years ago after presenting to his health center with fatigue. He failed six months of Category I and was then treated with Category II but remained culture positive after eight months. Multiple DST results at the end of Category II treatment showed MDR, and he was subsequently started on an MDR regimen.

**Past medical history:**
He was diagnosed with diabetes mellitus about four years ago and has been managed with glibenclamide (known as glyburide in the US). Monthly random glucose levels have been well controlled, with a level of 105 mg/dl one month prior.

**Current medications**
- **Pyrazinamide** 1750 mg daily;
- **ethambutol** 1600 mg daily;
- **capreomycin** 1 g daily;
- **ofloxacin** 800 mg daily;
- **cycloserine** 750 mg daily in two divided doses;
- **ethionamide** 750 mg daily in two divided doses;
- **PAS** 8 g daily in two divided doses;
- **pyridoxine** 150 mg daily;
- **glibenclamide** 5 mg daily;
- **metaclopramide** 10 mg twice daily before administration of medications;
- **cisapride** 10 mg before meals;
- **amitriptyline** 25 mg daily

**Physical Exam:**
- **General** tired appearing;
- **weight** 68 kg;
- **head and neck** oral mucosa dry, no exudates;
- **chest** clear;
- **abdomen** soft, non-tender and non-distended;
- **lower extremities** no edema

**Laboratory (normal values in parentheses)**
- **Creatinine** 0.58 (0.6 – 1.2 mg/dL)
- **Glucose** 305 (80 – 120 mg/dL)
- **HIV serology** negative

**Microbiology**
- Smear microscopy from baseline, month one and month two positive; negative starting month three.
- Sputum cultures from baseline, month one and month two positive; negative starting month three.

*Case Origin: South America*
TEACHING POINTS

Patients with diabetes and MDR-TB are extremely challenging because many common complications of diabetes overlap with side effects of second-line TB drugs. Nausea and vomiting can be caused by gastroparesis. The presentation of diabetic peripheral neuropathy is the same as that of peripheral neuropathy caused by cycloserine. Visual problems can be caused by diabetic retinopathy or simply high blood glucose levels. Diabetic nephropathy is often present due to years of poor glycemic control, and increases the risk for nephrotoxicity from the injectable.

Many of this patient’s symptoms could be caused by MDR-TB drugs, but before considering changing the regimen, it is important to confirm that the patient actually has good glycemic control. In many resource-limited settings, tight glycemic control is often not practiced. MDR-TB treatment is actually a good opportunity to reinforce patient education, re-evaluate and improve control of blood glucose levels, and manage diabetic complications. Random blood glucose levels can be misleading. Hemoglobin A1c is a much more accurate measure of glycemic control. If it is not available, simply asking the patient to measure blood glucose multiple times a day and recording when they were measured in reference to meals is also effective.

OUTCOME

In this patient, the blood glucose monitoring was increased to three times a week. Subsequent testing over the next week ranged between 260 to 280 mg/dl.

The dose of glibenclamide was increased to three times a day before meals. Blood sugar continued to range between 160 to 180 mg/dl over the next few weeks. The patient was educated about the importance of diet in controlling blood sugars. Metformin was started. Initiation of insulin was discussed but deferred.

Blood glucose control subsequently improved. Blood sugars fell into the normal range two months after starting metformin. Ophthalmology was consulted for evaluation of retinopathy using fundoscopy, which was negative.

Treatment for MDR-TB was extended given concerns about diabetes and relative immunocompromise. The patient was declared cured after 24 months of treatment.