Turkish Journal of Endocrinology and Metabolism, (2000) 2 : 75-76 **ORIGINAL ARTICLE**

U-40 Syringe for U-100 Insulin: A New Cause of Hypoglycemia in Turkey

Dear Sirs,

We would like to draw your attention to a new cause of hypoglycemia in Turkey. On July 7th, 2000 an 80-year-old woman was brought to the emergency room at 1 p.m. for loss of consciousness due to a serum glucose of 35 mg/dl. Administration of 500 ml of 10% dextrose resulted in recovery of consciousness and a capillary blood glucose of 158 mg/dl in fifteen minutes. Her serum sodium was 141 mEq/L, potassium: 2.8 mEq/L, urea: 56 mg/dl and creatinine was 0.7 mg/dl. To correct her hypokalemia isolyte 1000 ml with 10 mEq KCL at 100 ml/hr was started. Two episodes of hypoglycemia developed two and fourteen hours later (31 and 49 mg/dl). These were treated with 10% dextrose infusion. Upon awakening, she told us that she takes Humulin N 25 units subcutaneously in the morning, cilazapril 2.5 mg tablet and atenolol 50 mg tablet once daily. She has had diabetes for 25 years and has used insulin for the last 10 years. She has never practised self-blood glucose monitoring (SBGM). Except for mild dehydration, there were no exogenous factors to cause severe hypoglycemia. When her son brought her medications, we found that she had used a U-40 syringe to inject U-100 insulin. She had actually injected 62.5 units of intermediate acting insulin rather than her usual dose of 25 units. She had hypokalemia from excess insulin. She did not experience the alarming adrenergic symptoms of hypoglycemia as she was taking a beta-blocker. Three months ago, her private physician at the community prescribed her U-100 syringes and insulin that were filled correctly by the local pharmacy. She also saw reports about the subject on TV in March. She ran out of her U-100 syringes at the beginning of July. Forgetful of the matter, she used her previous U-40 insulin syringes. After her hypoglycemic episodes were resolved, we gave her Humulin N 25 Units with correct material. Her fructosamine was 3.03 mmol/L (normal: 1.61-2.68) and HemoglobinA1C: 8.5% (normal 4.3-5.8 %). We think that the excessive dose of insulin first normalized her elevated blood sugar in a few days, then caused hypoglycemia.

We report the case of an elderly patient who suffered severe hypoglycemia due to erroneous use of U-40 syringes with U-100 insulin. Turkey has changed its insulin concentration in a period starting on January 1st and ending on March 31st, 2000. This incident happened 6 months after the initial change. One should always consider erroneous use of U-40 syringes with U-100 insulin in diabetics who present with hypoglycemia in Turkey. The opposite should be kept in mind for patients who have hyperglycemia with no other explanation. This is always a possibility as U-40 insulin and syringes have not been collected. If the changes were made on a case by case basis at the diabetic clinics in Turkey, there would be no such an adverse event. We do not have information about the setting in which insulin-requiring diabetics receive their care in Turkey. In the United Kingdom where 80% of the diabetic population are seen at special diabetes clinics, patients were switched under the direct supervision of the physician. It was the doctors' responsibility to train the diabetic patient and to issue a prescription for U-100 materials. The pharmacist collected all the U-40 materials before filling the new prescription. Conversion to U-100 insulin was postponed if the patient failed to bring old insulin and syringes to the pharmacy. The patient practiced with U-100 materials in the clinic until a diabetes specialist nurse was satisfied with his or her competence (1). Another take home message from this case is the importance of SBGM and diabetes education. Our patient did not perform blood sugar checks. If she had self-diagnosed low or low-normal

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blood sugar earlier, hospitalization due to hypoglycemia could have been prevented. An educated patient should contact to his/her physician to avoid a catastrophe when he/she encounters a very high or low reading at SBGM. SBGM can always foresee future problems. It is reported that 21% insulin requiring type 2 diabetics do not check their blood sugar at all, but patients who perform daily SBGM have better quality of metabolic control (2).

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