Can Self Blood Glucose Monitoring prevent hospitalization for hypoglycemic events? A retrospective observational study on diabetic patients treated with insulin or sulfonylureas in the Treviso Local Health Authority No.9

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Diabetes is a very common and rapidly growing disease. Pharmacological treatment is the only means at present to prevent hyperglycemia in these patients, especially for type 1 diabetes. One adverse consequence of treatment can be hypoglycemia. Drugs with the highest risk of hypoglycemic events are insulin, sulfonylureas and meglitinide. This study was carried out to evaluate the incidence of diabetic patient hospitalization for hypoglycemia within the Treviso Local Health Authority No. 9. This retrospective observational study was conducted using databases provided by the Treviso Local Health Authority No. 9. The enrolled population was divided into insulin-treated (IT) and non-insulin-treated (sulfonylureas or repaglinide (NIT SR)) groups. Hypoglycemic events considered include patient hospitalization for hypoglycemia, following the algorithm proposed by Ginde et al., through the extraction of the following ICD-9 codes: 251.0, 251.1, 251.2, 270.3, 775.0, 775.6 and 962.3*, hospitalizations for fractures and Access to Emergency (AE) for accident and coma or altered state of consciousness. The inclusion of fractures is justified, as falls due to loss of consciousness is not uncommon in diabetic patients, especially those treated with insulin (Schwartz et al.). Therefore, we considered these patients as defacto hypoglycemic. Hypoglycemic events could be prevented by Self Monitoring Blood Glucose (SMBG); for these individuals the consumption of test strips was taken into consideration. The following databases were consulted: drug prescriptions, Hospital Discharge Records (SDO), AE and Regional Assistance Financial Statement (AIR). The period of study was 2008-2011. A total of 22,574 diabetic patients between 2008 and 2011 were enrolled, of which IT or NIT SR comprised 76% (77%, women; 75%, men). Patients (IT or NIT SR) with hypoglycemia represented 7% for both genders. Women, however, had a higher average age than men (75 years vs. 69 years, respectively). The use of the proposed algorithm showed that during the same period, patients treated with drugs with a high risk of hypoglycemia had more AE or hospitalization compared to those treated with other anti-diabetic drugs such as metformin, dipeptidyl-peptidase-4 inhibitors (DPP-4Is), incretin-mimetics, etc (26 patients/1000 vs. 14 patients/1000, respectively, in 2011). Patients treated with DPP-4Is were also evaluated, as DPP-4Is (unlike other drugs) do not cause hypoglycemic events - due to their glucose-dependent mechanism of action. Patients treated with DPP-4Is did not have any hospitalization for hypoglycemic events. The AIR databases revealed a difference in daily consumption of strips between IT patients without and with hypoglycemic events: according to the algorithm, the former group made fewer daily SMBG than other IT patients (2.2 strips/die vs. 2.5 strips/die, respectively). Based on the algorithm applied, drugs which carry of high risk of hypoglycaemia, such as insulin, sulfonylurea and meglitinide, cause a greater number of hospitalizations for hypoglycemic events, fractures, and AE for accident coma or altered state of consciousness. SMBG can also help to prevent these kinds of events, especially for IT patients.

Adit A Ginde, Philip G Blanc, Rebecca M Lieberman et al., Validation of ICD-9-CM coding algorithm for improved identification of hypoglycaemia visits, *BMC Endocrine Disorders*, 2008.
Ann V Schwartz, Teresa A Hillier, Deborah E Sellmyer et al., Older women with diabetes have a higher risk of falls, *Diabetes Care*, 2010, pp. 1749-1754.