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Severe hypoglycemia in type 2 diabetes mellitus patients managed in the primary care: incidence and risk factors

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Introduction

Type 2 Diabetes Mellitus (T2DM) is one of the most common chronic conditions encountered in the primary care, affecting up to 10% of HK population. Its complications including kidney disease, blindness, lower limb amputation and coronary heart disease have led to increased morbidity and mortality among diabetic patients. Extensive evidence has shown that optimal glycaemic control among T2DM patients helps reduce the microvascular and macrovascular complications and all-cause mortality.

Objectives

To determine the incidence rate (IR) of severe hypoglycemia (SHG) in type 2 diabetes (T2DM) patients managed in the primary care and to explore possible associating risk factors.

Methodology

Design: Retrospective case series study

Setting: General Outpatient Clinic of Hospital Authority, Hong Kong

Patients: T2DM patients who had been regularly followed up in GOPCs of KCC from 1 July, 2010 to 30 June, 2016. SHG is defined as any episode of hypoglycemia requiring emergency admission to the hospital.

Main outcome measures: Demographic data, biochemical parameters, co-morbidities, drug treatment profile and reasons for SHG were retrieved from the Clinical Management System. Student's t test and analysis of variance were used to evaluate continuous variables and Chi squared test for categorical data. Multivariate logistic regression was used to determine the associating risk factors for severe hypoglycemia.

Result

The satisfactory glycemic control rate of T2DM cases managed at KCC GOPCs has been significantly increased over the past 6 years. Meanwhile, the IR of SHG has been significantly reduced in recent three years, with the latest IR of 0.81% per year from 1/7/2015 to 30/06/2016. Patients who had history of SHG were much older than those without. Compared with age- and sex- matched DM cases without SHG, SHG patients had a longer duration of DM, a lower BMI and were more from Old Age Home (OAH) (all $P < 0.001$). Although their Hba1c level was comparable, the serum Creatinine and urine ACR level were much higher in the SHG group, whereas eGFR and total cholesterol (TC) level being much lower than non-HCG group.

Hypoglycemia DM patients were also found to have a higher co-morbidity rate of dementia, anemia, stroke and chronic kidney disease (CKD) and with a higher proportion being treated with Sulphonylureas (SU) and insulin. Logistic regression analysis revealed that the presence of SHG was associated with an older age [Odds Ratio (OR) 1.98], lower BMI (OR 0.78) and TC level (OR 0.3), co-morbidity with dementia (OR 10.5), anemia (OR 4.4), stroke (OR 2.4), CKD (OR 2.1) and treatment with SU [Daonil (OR 4.4) and Diamicron (OR 2.3)] and insulin (OR 2.4). Most common precipitants for SHG episode included poor appetite/decreased oral intake (37%) and infections (25.6%).