Hypoglycemia in the Elderly

Chia-Jung Hsieh¹, Dr. Meng-Jung Chen²*

¹Chung-Hwa University of Medical Technology, Taiwan
²Department of Family Medicine, Chi-Mei Medical Center, 901, Chung-Hwa Road, Tainan, Taiwan.

Abstract

Hypoglycemia is a common condition happening in the elderly, this condition might not be noted by patients or the health care providers without keen awareness. Hypoglycemia in the elderly leads to complications including all kinds of dysfunction. This eventually results in health deterioration and poor outcomes. The association between hypoglycemia and health deterioration is related with a lot of factors including poor oral intake, renal insufficiency and other co-morbidities. More effort should be made to improve the nutrition status in the elderly by increasing calories intake and also by increasing physical activity to improve overall health condition. A more careful approach regarding selecting appropriate agents to glycemic control in the elderly population for those who have diabetes with an immediate response plan should be made to avoid from the complications of hypoglycemia and achieving a good life quality possible.

Keywords: hypoglycemia, the elderly

INTRODUCTION

Diabetes Mellitus is becoming a major problem worldwide. Most diabetic patients are not aware of their problems. Diabetes Mellitus is aggravated by the increase in body weight and little exercise. More education should be made to improve the awareness of diabetes. An efficient approach to sugar control in the overall population with diabetes should be made to avoid from the possible complications of treatment especially the hypoglycemia. Hypoglycemia is referred to as a symptomatic condition of reduced blood sugar level below the normal range. Hypoglycemia is one of the most common complications in the treatment of diabetes. Hypoglycemia may happen in any type of 

* (Corresponding Author: Dr. Meng-Jung Chen, E-mail: ericmjc@yahoo.com.tw)
diabetes as side effect of overt treatment with certain drug therapy. Hypoglycemia in the elderly with diabetes is hard to estimate because of limited available studies. Some hypoglycemic incidences are very mild and are not noted by patients, family or the health care providers at all. But, severe hypoglycemia may present with symptoms such as consciousness change or convulsion. The complications with hypoglycemia can cause fall injury, vehicle accidents, head trauma or fractures. For those with less severe hypoglycemia may cause all kinds of dysfunction, leading to health deterioration in the long run. The importance of hypoglycemia in the elderly is not well recognized and managed. This review article explores hypoglycemia in the elderly with diabetes. A review was done by using database from medline to explore the hypoglycemia in the elderly.

HYPOGLYCEMIA DEFINITION

Hypoglycemia is a condition of reduced blood glucose level below 70 mg/dl. Hypoglycemic coma is a medical emergency because prolonged severe hypoglycemia may result in permanent neurological deficit. Hypoglycemia also has a negative impact on the cardiovascular system. Severe hypoglycemia may result in arrhythmias. Severe hypoglycemia requiring admission in patients with diabetes happened mostly in elderly. Low HbA1c level indicates too much treatment as a main cause of severe hypoglycemia in the elderly. Hypoglycemia may occur in patients using insulin or other drugs to treat their diabetes. Hypoglycemia may be caused also by adrenal, liver, renal insufficiency or alcohol intoxication. Hypoglycemia requires the help of another person to give carbohydrates, glucagon or other treatment. Recurrent hypoglycemia is usually referred as 2 or more episodes of severe hypoglycemia in the last 12 months. Severe hypoglycemia is usually combined with central nervous system dysfunction requiring medical help. Particularly high risk for severe hypoglycemia was observed in patients with Diabetes Mellitus treated too intensively.

RECOGNITION IN OLD AGE

Although hypoglycemia in the elderly with diabetes is not uncommon, its recognition is not easy at all. Hypoglycemia may be presented with nonspecific symptoms such as light headiness or mood disorder because of more diverse neurological presentations than the typical autonomic symptoms such as cold sweating or palpitation. Another difficulty is the resemblance in the presentation of hypoglycemia with dementia because patients may all present with conscious disturbances or behavioral changes. This may lead to unawareness of the progression of hypoglycemia.

COMPLICATIONS

The elderly with diabetes are likely to have hypoglycemia if combined with comorbidities, such as renal or liver dysfunction, irregular meal pattern and polypharmacy compared with the younger ones. Severe hypoglycemia may induce
acute events such as stroke, ischemic heart disease, heart failure, or arrhythmias. Recurrent hypoglycemia is associated with mobidities which could cause significant dysfunction and eventually poor health condition.

INCREASED MORTALITY

Nocturnal hypoglycemia may cause sympathetic overactivity, leading increased Q-T interval and ventricular arrhythmia or sudden death. Tight sugar control has also been noted to be related with increased mortality in the previous study. The poor nutrition status and frailty are predisposing factors to mortality. Therefore these high-risk patients should be recognized and glycemic control should be carefully managed and planned. In insulin treated patients, long acting insulin might be a better choice as they might reduce the incidence of hypoglycemia. Patients who do not have regular eating habits and unreliable food ingestion should be treated with careful dosage adjustment based on the current situation.

SUGGESTED MANAGEMENT

According to the recommendations of EASD and ADA metformin is the drug to be used in all patients with newly diagnosed type 2 diabetes (excluding contraindications). It is also recommended to use metformin as part of combination therapy. Metformin is effective in reducing the risk of cardiovascular complications in patients with type 2 diabetes in a previous study. A special advantage of metformin treatment is the low risk of hypoglycemia. It is important that the high-risk patients should be detected and sugar control should be monitored frequently. Medications should be reviewed to change from longer acting agent such as sulfonylureas into shorter acting agents or agents with little or no hypoglycemia effect. In patients treated with insulin, long acting insulin may be a better choice because of less chances of hypoglycemia.

SGLT2 inhibitors take reabsorption of about 80% urine glucose. This leads to a reduction in the renal threshold (approx. 175 mg/dl) and therefore increases the excretion with urine, even with normal glucose values. Its therapy is associated with a reduction in blood glucose and glycosylated hemoglobin (HbA1c). If SGLT2 inhibitors are added to the previous use of insulin, there will be less chances of hypoglycemia and less insulin dosage needed. The risk of hypoglycemia in case of monotherapy with SGLT2 inhibitors is about the same as the placebo. This is particularly important in the elderly patients.

DPP-4 inhibitors are oral agents that prolong the activity of endogenously released GLP-1 and GIP by inhibiting the DPP-4 enzyme. DPP-4 inhibitors have low hypoglycemic risk because of their glucose-dependent action. DPP-4 inhibitors, when used as monotherapy or in conjunction with other agents, would be of help in patients with Diabetes Mellitus to reduce the incidence of hypoglycemia for those who have comorbidities such as renal insufficiency.
Recently there is more use of the agonists of the GLP-1 receptor for the treatment of type 2 diabetes. Age of the patient is not a contraindication for treatment with GLP-1 receptor agonists. Benefits of GLP-1 receptor agonists therapy can be used in the elderly with type 2 diabetes and obesity. The advantages of GLP-1 receptor agonists therapy are a lower incidence of hypoglycemia and weight reduction provided that the elderly is in a good nutrition status or overweight.

The aging population is happening in almost every country. If we can improve diabetes care with better sugar control, there will be less incidence of hypoglycemia, which is the major complication of treating diabetes. The elderly with diabetes have a higher risk for hypoglycemia is probably due to slow or poor reactions to low sugar levels. They also may have some conditions, such as cognitive and functional dysfunction, that makes the recognition and treatment of hypoglycemia difficult.

A patient with hypoglycemia who is still conscious should be treated with about 20 grams of carbohydrate such as 4 sugar cubes or candies, a cup of milk or juice. They should receive intensive follow up with regular glucose monitoring and meal eatings. If a patient is unclear, glucagon may be administered intramuscularly if possible or intravenous glucose should be given on the way to the hospital by the emergency medical technician.

The elderly with hypoglycemia also have higher risk for falls, head trauma, fractures or convulsion, leading to health deterioration. Thus, hypoglycemia in the elderly must be recognized and treated to avoid those possible morbidity and mortality. Education to these patients and their family is important to manage and prevent the complications of hypoglycemia.

Hypoglycemia has tremendous impacts on all aspects in the elderly. While mild hypoglycemia might only influence the life quality, severe hypoglycemia is life-threatening and can lead to further cardiovascular and cerebrovascular events such as arrhythmia or dementia. A well managed treatment and education should be planned in advance to avoid or deal with the situation of hypoglycemia. The risk of hypoglycemia will be reduced if the diabetic agents with little or no risk of hypoglycemia are chosen. The importance of checking the sugar level by patient or the carers should be stressed. Regular check of blood sugar level is a good way to know the trend of blood glucose and detect asymptomatic hypoglycemia. It is of utmost importance when patients are under the treatment of insulin or other potent agent.

**CONCLUSION**

Hypoglycemia in the elderly with diabetes is easily missed due to the non-specific presentation in this particular group. Also, patients who fail to present the warning symptoms of hypoglycemia are more likely to have delayed diagnoses. For those who cannot communicate well because of dementia or old cerebrovascular diseases are also at a higher risk. Hypoglycemia in the elderly is likely to be under-diagnosed. Recurrent hypoglycemia can cause a lot of morbidity leading to all kinds of dysfunction and eventually health deterioration. More effort should be made to improve the nutrition...
Hypoglycemia in the Elderly

status in the elderly by increasing calories intake and by increasing physical activity to improve their overall health condition. Education of diabetes is vital for diabetics to know because it is of help in preventing and dealing with the associated complications. A more careful approach regarding selecting appropriate agents to glycemic control in the elderly population with diabetes with an immediate response plan should be made to avoid from the complications of hypoglycemia and achieving a good life quality possible.

REFERENCES


