

5th World Congress on

Diabetes & Metabolism

November 03-05, 2014 Embassy Suites Las Vegas, USA

Hypoglycemia in diabetes mellitus: Correlation with HbA1C and overall glycemic control

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Aim: To analyze the correlation between hypoglycemia and HbA1C, as well as other predictors of overall glycemic control in Diabetes Mellitus.

Methods: A retrospective chart review of our Diabetes clinic database was conducted, and included Diabetic adults on insulin with frequency of home blood glucose (BG) monitoring >2/day in 90 days prior to visit, who presented to the clinic in September 2013. Final sample size satisfying criteria was 41. Outcome measures and variables studied were frequency of episodes of hypoglycemia (BG ≤ 70 mg/dL) and severe hypoglycemia (BG ≤ 45 mg/dL); HbA1C, gender, type of DM, age, treatment modality, body mass index, hypertension & evidence of nephropathy. Data was analyzed in SPSS.

Results: Out of the 41 patients, 52% had type 2 Diabetes, 70% had hypertension, 70% were on ACE/ARB, 36% had nephropathy & 27% were an oral agent in addition to insulin for management. There was a strong positive correlation between HbA1C and average blood glucose (Pearson coefficient +0.7), and a weak negative correlation between HbA1C and hypoglycemia frequency both BG ≤ 70 and BG ≤ 46 (Spearman coefficient -0.3). The frequency of hypoglycemia (both BG ≤ 70 and BG ≤ 45) was higher in type 1 Diabetics, females, those with hypertension and using Insulin alone as treatment (p < 0.05). The frequency of hypoglycemia also had a strong negative correlation with body-mass index, a weak negative correlation with age & almost no correlation with the range of blood glucose values.

Conclusion: The frequency of episodes of hypoglycemia (BG ≤ 70) as well as severe hypoglycemia (BG ≤ 45 mg/dL) is higher in individuals with lower HbA1C, but the correlation is weak. In addition, other factors such as female gender, lower body-mass index, type 1 Diabetes, hypertension, and use of insulin alone as treatment modality, are associated with higher frequency of hypoglycemia. Interestingly, more hypoglycemic episodes were observed in younger diabetics, but the association of age with Type 1 Diabetes and lower body-mass index might explain this finding. To conclude, the association of more frequent hypoglycemia with lower HbA1C is weak and might be affected by patient characteristics and other factors that influence overall glycemic control. This study was limited due to its small sample size. We are currently performing a retrospective study with a larger sample size to better elucidate these associations.

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