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GLUCOSE FLUCTUATION PATTERNS FROM CONTINUOUS GLUCOSE MONITORING ARE ASSOCIATED WITH DYSGLYCEMIA AND ABNORMAL INSULIN RESPONSE

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INTRODUCTION

The association between continuous glucose monitoring (CGM) data, physiologic response to glucose, and dysglycemia is not well-established.

METHODOLOGY

We evaluated the patterns of dysglycemia from CGM and correlated them with glucose, insulin, and GLP-1 from a 75-gram oral glucose tolerance test (OGTT). Cluster analysis was used to classify CGM patterns based on glucose variability and the ability to control glucose levels.

RESULTS

The study enrolled 37 subjects with 19 on the abnormal glucose tolerance (AGT) group and 18 on the control group. No differences in insulin, GLP-1, HOMA-IR, and insulinogenic index between the AGT and control group were observed. Continuous glucose monitoring data revealed less time in normoglycemia and a significantly higher percentage of time above range in the AGT group. Within the AGT group, differences were more pronounced in subjects with impaired fasting glucose (IFG) than impaired glucose tolerance (IGT) or combined IFG and IGT. Higher glucose excursion and a longer return time to baseline in the combined IFG and IGT group were observed. The AGT group had a significantly lower proportion of cases with a pattern of glucose levels that rise and fall back to baseline within 2.5 hours than the control group (0.33 vs. 0.35, $p = 0.023$). Pearson correlation analysis revealed that the LB2 pattern correlated with less insulin resistance and lower glucose burden.

CONCLUSION

Glucose dysregulation characterized by CGM is more heterogeneous than previously thought. Detection of specific glucose patterns from CGM could identify people at risk of diabetes.

KEYWORDS

dysglycemia, continuous glucose monitoring, glucose variability, insulin, GLP-1