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Beyond TIR: The Role of GRI in Glycemic Risk Evaluation

Evaluating the Correlation Between Time-in-Range (TIR) and Glycemia Risk Index (GRI) Using Continuous Glucose Monitoring (CGM) in Indian Patients with Diabetes

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- **Background**
- Time-in-Range (TIR), derived from Continuous Glucose Monitoring (CGM), is widely used to assess glycemic control. ADA-recommended CGM metric for glycemic control.
- **Limitation:** TIR alone does not reflect risks of variability or extremes.
- Glycemia Risk Index (GRI), introduced in 2022, is a novel metric that integrates both frequency and magnitude of hypo- and hyperglycemia into a single score. www.diabetestechology.org/gri.

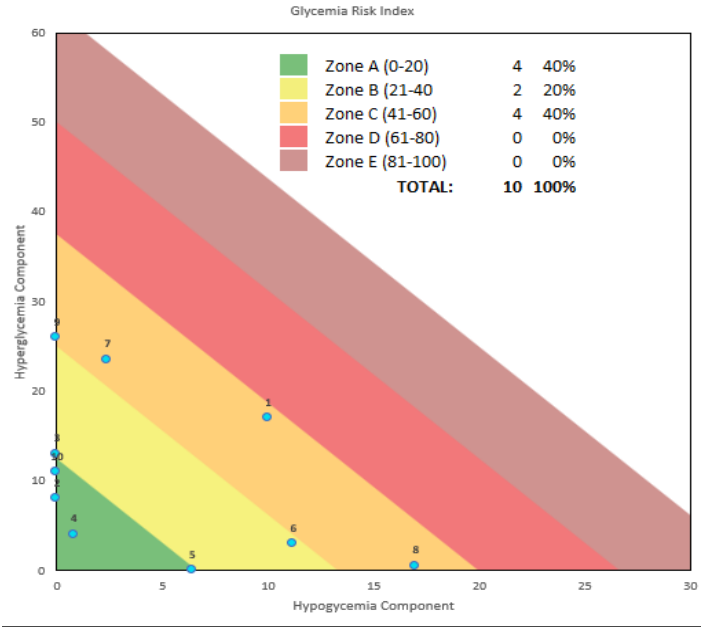
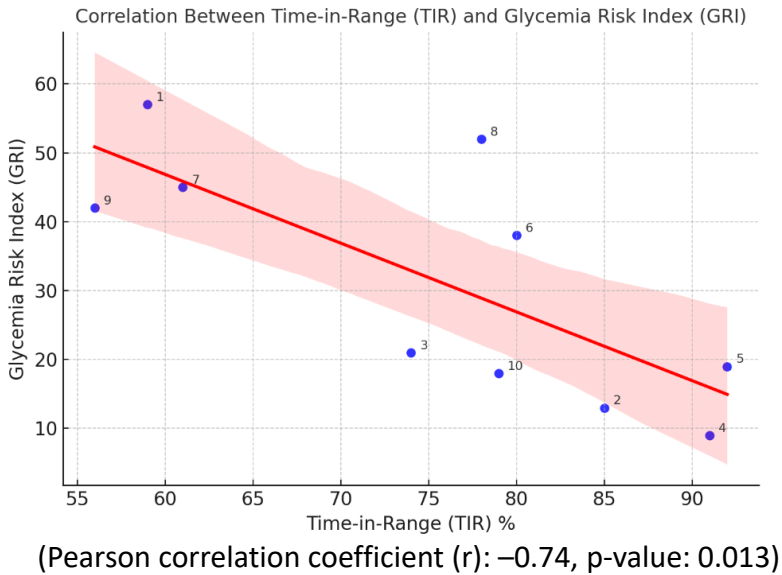
Objective : Assess correlation between **TIR** and **GRI** using real-world CGM data.

Methods

- Design: Retrospective analysis of CGM data.
- Sample: 10 patients with diabetes.
- TIR (%): Percentage of time glucose levels within 70–180 mg/dL.
- GRI: Computed using an online tool considering time in Very Low, Low, High, and Very High glucose ranges.
- Analysis: Pearson correlation between TIR and GRI.

Results:

- TIR values ranged from 56 % – 92 %, and corresponding GRI scores ranged from 9 to 57.
- A strong inverse correlation was found between TIR and GRI ($r = -0.74$, $p = 0.013$)).
- Notably, patients with similar TIR values exhibited significant variability in GRI, indicating differing glycemic risks that TIR alone failed to capture.



The results in percentiles are divided into zones (A–E) from the best (Pc: 0–20) to the worst (Pc: 80–100) glycemic control.

Conclusion:

GRI complements TIR by capturing glycemic risks that remain unrecognized through TIR alone. Incorporating both metrics into clinical practice may enhance risk stratification and inform individualized diabetes management. **Limitation: Small sample size**

GRI is Useful: Single, actionable metric – quick to calculate and easy to use. **Complement TIR** in capturing **hypoglycemia risk** and **extreme glucose value**. **Helps prioritize care** for patients with poorer glycemic control. **Guides treatment** by highlighting both hypo- and hyperglycemia components.