

CUMULATIVE TIME IN BAND (CTIB): GLYCEMIC LEVEL, VARIABILITY AND PATIENT OUTCOME vs MORTALITY

Introduction

Negative outcomes of dysglycemia are associated with exposure and repetition to high glucose levels, indicating that metrics of exposure might influence outcome.

Objectives

To determine cumulative time in band (cTIB) thresholds associated with improved outcomes for intermediate levels of glycemic control (4.0-7.0 mmol/L, 5.0-8.0mmol/L and 4.0-8.0mmol/L).

Methods

Retrospective analysis of patient data (N=1717) from the SPRINT (N=784) and Glucontrol (N=933) studies. cTIB is the %BG from start to the present day within the specified band. It is evaluated daily for the 4.0-7.0mmol/L, 5.0-8.0mmol/L and 4.0-8.0mmol/L bands, with thresholds (t = 50%, 60%, 70%, 80%) for all patients. The odds ratio (OR) is calculated for cTIB \geq t versus cTIB<t for each day 1-14 with 95% CI.

Results

The table shows OR range for days 1-14. For all glycemic bands and all thresholds t, OR>1.0 for all but day 1.

BG Band	t=50%	t=60%	t=70%	t=80%
4.0-7.0mmol/L	1.10-1.42	1.07-1.98	1.08-2.35	1.18-3.76
5.0-8.0mmol/L	1.14-1.34	0.98-1.65	0.98-2.39	1.07-1.70
4.0-8.0mmol/L	1.04-1.28	1.00-1.54	0.96-1.65	0.91-2.28

The lower bound of the 95%CI over days 1-10 where patient data is greatest:

	t=50%	t=60%	t=70%	t=80%
4.0-7.0mmol/L	0.85-0.96	0.82-1.12	0.81-1.56	0.84-1.67
5.0-8.0mmol/L	0.89-0.88	0.76-0.89	0.74-1.02	0.78-0.90
4.0-8.0mmol/L	0.80-0.82	0.78-0.81	0.74-0.98	0.70-1.10

Conclusions

High cTIB in the 4.0-7.0mmol/L band significantly greater odds ratio over days 1-14 compared to the 4.0-8.0mmol/L and 5.0-8.0mmol/L bands. It suggests tighter glycemic control improves patient outcome if control is maintained limiting exposure to glycemia outside 4.0-7.0mmol/L. cTIB is readily calculated and can continuously assess control quality during a patient's stay.

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