

The Role of Perioperative Glucose Management In At Risk Surgical Closures: The Case for Tighter Glycemic Control.

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Purpose: Despite the recognition of the important role that tight glycemic control plays in patients with diseased states, the risk of poor control in patients undergoing surgical closure has yet to be fully defined. We sought to determine the increased risk that poor glycemic control introduces to surgical closures in a high risk patient population.

Materials and Methods: We performed further analysis of a previous randomized study of high risk patients who underwent surgical closure of a variety of wounds. Blood glucose levels were taken regularly during their hospital stay and recorded for five days before and after surgical closure. Primary endpoints were rates of healing, dehiscence, infection and reoperation. Univariate and multivariate analyses were performed.

Results: 81 patients who underwent primary closure of wounds, the majority in the lower extremity (89%), were included for analysis. Average follow up was 113 days. Preoperative and postoperative hyperglycemia (defined as any blood glucose measurement recorded above 200) were significantly associated with increased rates of dehiscence (OR 3.46, $p=0.028$ and OR 3.46 and $p=0.028$ respectively). Preoperative hyperglycemia trended toward significance with increased rates of reoperation ($p=0.09$). There was no association between preoperative or postoperative hyperglycemia and rates of infection ($p=0.457$ and $p=0.457$). Variability in preoperative glucose (as defined as a range of glucose measurements exceeding 200 points) was significantly associated with increased rates of reoperation ($p=0.025$).

	Dehiscence Rate	Re-operation Rate	Infection Rate
Preoperative BG <200mg/dl	18.2%	12.1%	6.2%
Preoperative BG >200mg/dl	43.5% P=.028 OR: 3.462 (1.2-9.9)	29.5% P=.096 OR: 3.04 (.89-10.40)	13.0% P=.457
Postoperative BG <200mg/dl	18.2%	15.1%	6%
Postoperative BG >200mg/dl	43.5% P=.028 OR: 3.462 (1.2-9.9)	27.3% P=.27	13% P=.457
Perioperative BG <200mg/dl	16%	12.0%	8.0%
Perioperative BG>200mg/dl	40.7% P=0.039 OR: 3.6 (1.08-11.97)	26.9% P=.24	11.1% P=1.0
Glucose Variability<200mg/dl	26.1%	11.6%	6.5%
Glucose Variability >200mg/dl	42.4% P=.150	35.3% P=.025 OR 4.14 (1.3-13.33)	15.2% P=.27

In multivariate regression including glycemic control, patient demographics, postoperative dressing and preoperative co-morbidities, only perioperative hyperglycemia was significantly associated with increased rates of dehiscence and trended toward increased rates of reoperation.

Conclusions: When considering surgical closure in high risk patients, the importance of tight glycemic control cannot be underestimated. Poor glucose management is associated with increased rates of dehiscence and reoperation. The reconstructive surgeon must therefore insist on tight glycemic control before and after surgery for better results.