Comparison of Insulin Pump Therapy (Continuous Subcutaneous Insulin Infusion) to Alternative Methods for Perioperative Glycemic Management in Patients with Planned Postoperative Admissions

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Abstract

Background:
Patients with diabetes who use insulin pumps [continuous subcutaneous insulin infusion (CSII)] undergo surgeries that require postoperative hospital admission. There are no defined guidelines for CSII perioperative use.

Methods:
This retrospective single-institution study identified type 1 and type 2 diabetes subjects by electronically searching 2005–2010 anesthesia preoperative assessments for “pump.” Surgical cases (n = 92) were grouped according to intraoperative insulin delivery method: (a) CSII continuation of basal rate with/without correctional insulin bolus(es) (n = 53); (b) conversion to intravenous insulin infusion (n = 20); and (c) CSII suspension with/without correctional insulin bolus(es) (n = 19). These groups were compared on mean intraoperative blood glucose (BG) and category of most extreme intraoperative BG.

Results:
Differences were found on baseline characteristics of diabetes duration (p = .010), anesthesia time (p = .011), proportions receiving general anesthesia (p = .013), and preoperative BG (p = .033). The conversion group had the longest diabetes duration and anesthesia time; it had a higher proportion of general anesthesia recipients and a higher mean preoperative BG than the continuation group. There was no significant difference in mean BG/surgical case between continuation (163.5 ± 58.5 mg/dl), conversion (152.3 ± 28.9 mg/dl), and suspension groups (188.3 ± 44.9 mg/dl; p = .128). The suspension group experienced a greater percentage of cases (84.2%) with one or more intraoperative BG > 179 mg/dl than continuation (45.3%) and conversion (40%) groups Figure 1 groupings (p = .034).

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Conclusions:
In this limited sample, preliminary findings are consistent with similar intraoperative glycemic control between CSII continuation and CSII conversion to intravenous insulin infusions. Continuous subcutaneous insulin infusion suspension had a greater rate of hyperglycemia. Preoperative differences between insulin delivery groups complicate interpretations of findings.