

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 ($p = .034$).

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Abbreviations: (BG) blood glucose, (CSII) continuous subcutaneous insulin infusion, (PACU) postanesthesia care unit

Keywords: anesthesia, continuous subcutaneous insulin infusion, glucose, insulin, pump, surgery

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Abstract cont.

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.

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