

Impact of a Novel Diabetic Management Protocol for Carbohydrate Loaded Patients within an Orthopedic ERAS Protocol

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Background: Carbohydrate loading prior to surgical procedures has been proven to decrease peri-operative insulin resistance leading to decreased surgical complication rates. Applying this process to patients with diabetes has been questioned due to elevated preoperative blood glucose levels with standard diabetic medication management. It is postulated that maintaining diabetic patients on their standard regimen of hypoglycemic medications will lead to improved perioperative blood glucose (BG) levels. We have implemented a diabetic medication protocol (DMP) for Type I/II diabetics where patients undergo carbohydrate loading and continue their standard hypoglycemic medication regimen through the morning of surgery.

Methods: We initiated an Enhanced Recovery after Surgery (ERAS) protocol in October 2014 where all patients undergoing total joint replacement (TJR) received carbohydrate loading over 12 hours prior to the start of surgery. The patients were provided with 3 bottles of a maltodextran based carbohydrate drink to consume over the 12 hours prior to surgery with the last drink taken 3 hours prior to surgical start time. Diabetics were asked to hold any oral hypoglycemic medications and take half their usual insulin dose the morning of surgery. On August 1, 2015 we implemented a DMP where carbohydrate loaded diabetics would continue, without modification, their diabetic medications until arrival at the hospital the day of surgery. We performed a retrospective review of 57 consecutive diabetic TJR patients from August 1 to December 31, 2015 compared with 25 consecutive diabetic TJR patients prior to implementing the DMP.

Results: A total of 82 diabetic patients undergoing TJR were reviewed. 25 patients prior to implementation and 57 patients after implementation were reviewed. 12 patients prior to implementation and 11 patients after implementation were excluded due to failure to comply appropriately with medication and or carbohydrate instructions Data was extracted on preoperative, intraoperative, recovery room and postoperative BG levels.

	BG BEFORE DMP			BG AFTER DMP		
	<80	80-200	>200	<80	80-200	>200
Preoperative	0	10	3	4	30	12
Recovery Room	1	10	2	5	40	1
POD#0 4PM	0	8	5	1	29	16

POD#0 9PM	0	9	4	0	32	14
POD#1 7AM	1	10	1	0	37	9
POD#1 11AM 0	4	8	0	27	17	
POD#1 4PM	0	5	6	0	35	9
POD#1 9PM	0	5	6	0	27	18

Conclusions: We have been able to show that diabetic patients may safely receive carbohydrate loading prior to TJR. Diabetic patients undergoing carbohydrate loading prior to surgery are able to safely continue their diabetes medications prior to surgery without a significantly higher incidence of perioperative hypoglycemia. The DMP did not lead to a decrease in the number of patients presenting with hyperglycemia prior to surgery though BG levels were significantly improved on POD#1 at 4PM. The overall number of complications was very low in both groups, therefore the impact of this protocol on surgical outcomes has yet to be determined. This documents the safety of carbohydrate loading diabetic patients prior to surgery as well as continuing diabetic medications until surgery. This practice should be evaluated further to determine the impact of this protocol on surgical outcomes.