Effects of intravenous dexamethasone on glycemic control in patients with well-controlled type 2 diabetes mellitus after total knee arthroplasty: Prospective, Randomized Controlled Study

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INTRODUCTION:

The perioperative administration of intravenous (IV) dexamethasone is recognized as effective in minimizing postoperative pain and postoperative nausea and vomiting (PONV) and facilitate early recovery after total knee arthroplasty (TKA). However, concerns persist regarding undesirable side effect resulting from administration of glucocorticoid during perioperative period especially in diabetic patients.

This study aimed to determine whether the IV administration of dexamethasone before and in the immediate postoperative period in well-controlled type2 diabetes mellitus (DM) patients (HbA1c < 6.5% with DM medication or 6.5% ≤ HbA1c < 7.05% without DM medication) (1) increases blood glucose level and insulin requirements, (2) increases postoperative complications, such as surgical site infections and delayed wound healing, and (3) mitigates postoperative pain, nausea and vomiting

METHODS: We randomized 92 well-controlled type2 DM patients undergoing TKA to receive IV injections of 10mg dexamethasone (DEXA group, n = 47), or 2cc normal saline (No-DEXA, n = 45) 1hour before the surgery and on postoperative day (POD) 1 morning (7am). From DEXA group, 3 patients were excluded due to periprosthetic fracture, other concurrent surgery and medical emergency (stroke). From No-Dexa group, 5 patients were excluded due to operation cancel, drug rash after steroid injection, and medical emergency (COVID-19 infection and pulmonary thromboembolism). Blood glucose levels were measured four times a day. Blood glucose curves were then generated from the operation day to POD 5. Pain levels, incidence of PONV and severity of nausea were assessed at postoperatively 0 to 6 hours, 6 hours to the night of the operation day, and daily on POD 1 to 5. Postoperative complications including delayed wound healing and surgical site infection were assessed within 90 days following surgery.

RESULTS:

The DEXA group showed a significant higher blood glucose levels on the operation day and POD 1. No significant differences were observed between the two groups from POD 2 to 5. The insulin requirement was higher in the DEXA group on POD 1. No significant differences were found on operation day, and from POD 2 to 5. Patients in the DEXA group reported lower pain during POD 1 to 3 and consumed less analgesics on POD 1. In severity and incidence of PONV, no significant differences were noted during the overall study period. There were no significant differences in wound complication and surgical site infection between two groups.

DISCUSSION AND CONCLUSION:

The IV administration of dexamethasone to well-controlled type2 DM patients undergoing TKA led to only transient elevation in blood glucose levels and insulin requirement, but no differences in wound complications or surgical site infections.

So, considering the effects of dexamethasone on reducing pain after TKA, the IV administration of dexamethasone is recommended for well-controlled type2 DM patients undergoing TKA.