

PD-16. THE EFFECT OF NSAIDS ON SPINAL FUSION

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Introduction: Nonsteroidal antiinflammatory drugs (NSAIDs) are prescribed frequently for the management of postoperative pain after spinal fusion surgery. Ketorolac, the only parenteral NSAID available in the United States, is frequently administered in the immediate postoperative period after a number of spinal procedures including lumbar laminectomy and lumbar fusion (1-3). A cost-benefit analysis revealed that ketorolac improved postoperative ambulation and pain and decreased hospitalization stays when utilized for spinal surgery (3). Unfortunately, these drugs are known to inhibit osteogenic activity (4) and interfere with spinal fusion both in the animal model (5,6) and in humans (7). On the basis of these data, many physicians are reluctant to use NSAIDs with patients undergoing spine arthrodesis. However, the new class of COX-2 inhibitors (celecoxib and rofecoxib) may offer an alternative to conventional NSAIDs in the management of pain after spinal fusion surgery (8). A recent study has revealed that COX-2 inhibitors do not have significant deleterious effects on the healing of intertransverse process fusions in the rabbit model (9). This study was designed to examine the effect of either ketorolac, celecoxib, or rofecoxib on the nonunion rate of patients undergoing posterior spinal fusion surgery.

Methods: We retrospectively analyzed the data on 342 patients receiving perioperative celecoxib, rofecoxib, ketorolac, or no NSAID between the years 1996 to 2001. All patients underwent single or bi-level instrumented posterior spinal fusion using autologous crest bone graft. Patients were administered a total perioperative dose of ketorolac (15-240 mg), rofecoxib (50 \bar{n} 250 mg), celecoxib (200 mg), or no NSAIDs in the 5 days following surgery. All patients received patient-controlled analgesia for the first 48 hours after surgery. No other NSAIDs or glucocorticoids were administered during the perioperative period. At 1-year follow-up, office records were reviewed to evaluate the status of the fusion. Nonunion was defined using similar criteria by Glassman et al. (7), which included surgical exploration, hardware failure, or tomograms.

Results: There were no differences in demographic variables, surgical procedures, or operative time among the four groups. A total of 90 patients received no postoperative NSAID therapy, whereas 112 patients received rofecoxib, 20 patients received celecoxib, and 120 patients received ketorolac. Nonunion rate was identified in 6/90 patients (6.7%) who received no NSAID, 8/112 patients (7.1%) who received rofecoxib, and 1/20 patients (5%) who received celecoxib. In contrast, nonunion was identified in 23/120 patients (19%) who received ketorolac. In the rofecoxib nonunion group: 2 patients received a total of 250 mg, 2 patients received 150 mg, and 1 patient received 100mg. In the ketorolac nonunion group: 17 patients received a total of 150-240 mg, 4 patients received 90-140 mg, and 2 patients received < 90 mg.

Conclusions: The perioperative administration of rofecoxib or celecoxib demonstrated no significant deleterious effect on spinal fusion. In contrast, similar to other studies (5-7), the administration of ketorolac resulted in a significant increase in the nonunion rate following posterior spinal fusion. Furthermore, this deleterious effect appears to be dose-related, in that doses > 150 mg resulted in the greatest incidence of nonunion.

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