Transdermal Buprenorphine Utilization Reduces Opioid Use in Orthopedic Patients: A Retrospective Study

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INTRODUCTION: Transdermal buprenorphine (TDB) is emerging as a potentially excellent option for the management of acute perioperative pain in orthopedic patients. TDB is FDA-approved with over ten years of market surveillance, and several randomized, clinical trials have shown TDB to be safe, with an improved side-effect profile compared to full opioid agonists. TDB reaches its full effect at 72 hours from patch application. The objective of this study was to assess the change in pain scores and opioid use from day of patch placement (no effect) to patch day 3 (full effect). Our hypothesis was that our patient cohort would have improved pain scores with decreased opioid use.

METHODS: A retrospective chart review of admitted adult orthopedic patients at a Level 1 trauma center from 2020 to 2025 who received TDB was performed. Demographics, concomitant non-opioid pain medication usage, readmissions, adverse events, substance use, psychiatric history and operative interventions were collected. Visual analog scale (VAS) was used to assess pain. Both short and long acting opioid administration was collected and daily Morphine milligram equivalents (MMEs) were calculated. VAS, Total MME, and short acting opioid agonist were compared between Patch Day 0 and Patch Day 3. Mean and standard deviation were used for demographic data and t-test was performed for statistical analysis.

RESULTS:

Fifty-seven patients were included. Mean age was 60.3 (SD, 19.5) with 53% males. Mean BMI was 29.4 (SD, 7.6). 66.7% were ASA 3. Average ISS was 6.38 (SD, 5.4). 75% (43/57) had surgical intervention. 61% of cases were orthopedic trauma, 32% spine, and 7% other. Patch was applied at a mean of 2.57 days (SD, 3.46) after surgery. Non-opioid pain medication included gabapentinoids (49.1% of patients), muscle relaxant (54.4%), and NSAIDs (35.1%).

Mean MME significantly decreased from Patch Day 0 (95.4, SD 89.6) to Patch Day 3 (76.7, SD 97.8), (p=0.015). Mean pain scores did not significantly decrease from Patch Day 0 (7.0, SD 1.9) to Patch Day 3 (6.7, 1.88), (0.158). Mean oxycodone (mg) use significantly decreased from 39.8 (SD, 37.8) to 37.7 (SD,35.9) (p=0.044).

Mean length of stay was 7.5 (SD, 2.8) days. 5 patients (9%) reported new nausea or emesis after patch. 15 (26.3%) had readmission within 30 days.

DISCUSSION AND CONCLUSION:

TDB is an emerging option for acute perioperative pain in orthopedic patients. In this pilot study with a heterogenous population of orthopedic patients, TDB treatment significantly decreased overall opioid use, as well as short acting opioid use with no worsening of pain scores. Further studies should continue to investigate TDB as part of multimodal regiments for pain control in orthopedic patients.