

The Perioperative Pain Management Bundle: An innovative approach to improve acute pain therapy

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The 'Perioperative Pain Management Bundle' is associated with better multi-dimensional pain scores after surgery. This effect is independent of surgical discipline.

BACKGROUND AND AIM

After surgery, pain-related patient-reported outcomes (PROs) are often poor and perioperative pain management practices vary considerably between institutions, indicating that evidence-based guidelines are often not strictly adhered to [1]. A 'bundle', is a small set of evidence-based interventions. When implemented together, these interventions will result in significantly better outcomes than when they are implemented individually or not at all [2].

In an earlier study, we found that staff could implement the 'Perioperative Pain Management Bundle' in 37% of a cohort of 2354 patients undergoing surgery in 5 surgical disciplines. This was associated with a significant reduction in a multidimensional Pain Composite Score (PCS), evaluating pain intensity, interference, and side effects. A sensitivity analysis indicated that surgical discipline did not have an effect on the PCS. The AIM of the current discipline-specific analysis was to gain further understanding of the effect and to determine the next steps in the study.

METHODS

PAIN OUT, a perioperative pain registry, provided staff in 10 hospitals in Serbia with tools for evaluating PROs and management on the first post-operative day.

The bundle consists of 4 elements: [i] full daily doses of 1-2 non-opioid analgesics; [ii] at least one type of local and/or regional anaesthesia; [iii] pain assessment by staff and [iv] offering information about pain management to patients. Patients were considered as having received the FULL bundle when they received all 4 elements of care (vs. 0 to 3 elements).

The primary endpoint was the percentage of bundle-treated patients within each surgical discipline: general, orthopaedics/trauma (ORTHO), gynaecology/obstetrics (OBYN), cardiac, urologic surgery.

The secondary endpoint was the adjusted mean differences in the PCS between patients with FULL bundle administration vs. without. This was analysed using mixed models with random intercepts for every participating ward.

The PCS served as dependent variable. Main independent variables were surgical discipline, FULL bundle administration (yes vs. no) and the interaction of both. The model was controlled for age, sex, pre-existing chronic pain and opioid intake on the ward.

The PCS was z-standardized before modelling. Thus, mean differences and the corresponding 95% confidence intervals (95%CI) can be interpreted as differences in standard deviations (absolute values: > 0.2: small, > 0.5 medium, > 0.8 large effect size).

RESULTS

The FULL bundle was implemented in 20%, 26% and 24% of patients undergoing general, ORTHO and cardiac surgery, respectively. Within these disciplines FULL bundle administration was associated with significantly lower values of the PCS, i.e. better outcomes. These were small-medium effect sizes (Figure 1).

As a composite score, the PCS does not intuitively reflect the individual items from which it is composed. We, therefore, also show descriptive findings of the single PROs for these surgical disciplines (Figure 2).

Few OBYN and urologic patients received the FULL bundle. We found no significant differences between patients with vs. without full bundle administration (Figure 1).

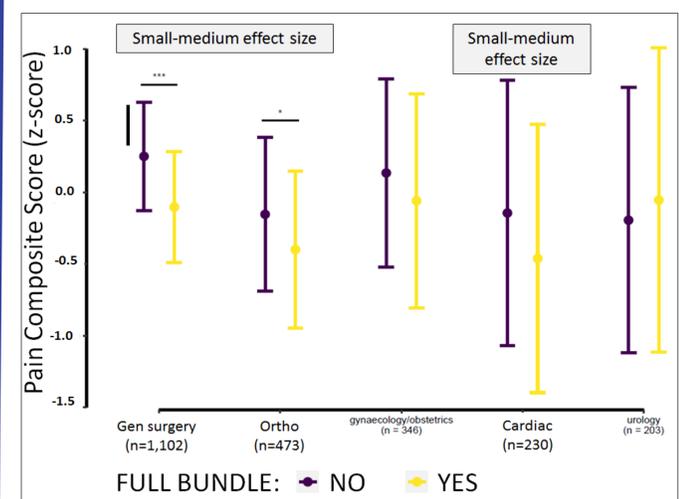


Figure 1 shows the estimated marginal means (dots) and 95% confidence intervals (capped lines) for the Pain Composite Score for each of the surgical disciplines for patients receiving FULL vs 0-3 bundle elements.

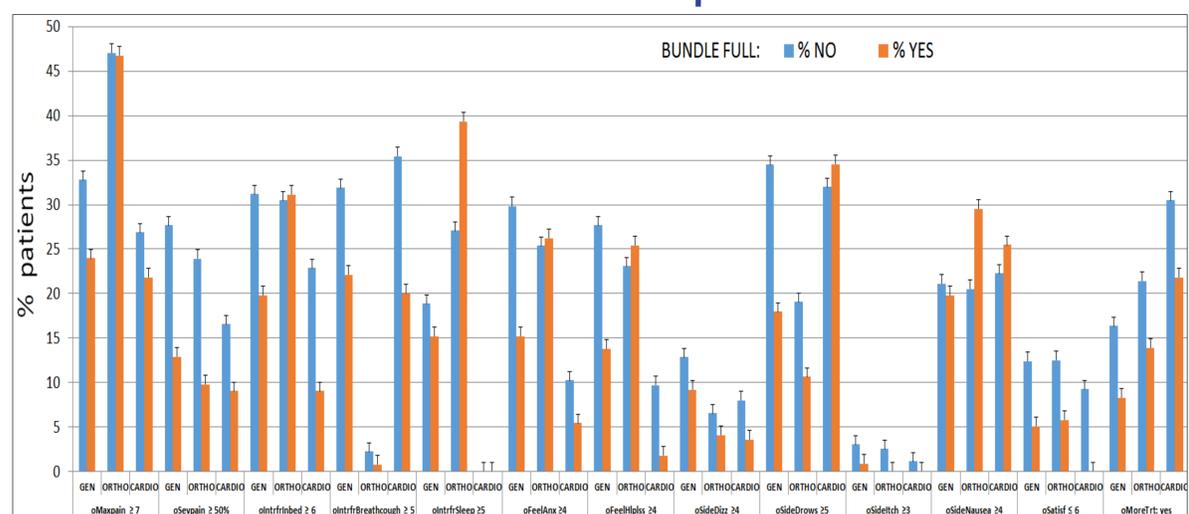


Figure 2 Dichotomized outcomes reported by patients receiving FULL (blue bars) vs. 0 to 3 bundle elements (red bars) for GEN, ORTHO and cardiac surgery. Medians with 95% CI.

CONCLUSIONS

Our findings indicate that implementation of the 'Perioperative Pain Management Bundle' varied considerably between staff working in the 5 surgical disciplines. The bundle was associated relief of post-operative pain in 3 disciplines where approximately a quarter of patients were treated according to its principles. It was ineffective in 2 disciplines where few patients received it. Thus, confirming our earlier analysis that the approach is independent of surgical discipline but that the effect is dependent on having a threshold number of treated patients.

Future work will seek out better understanding of the conditions when the bundle is acceptable to staff and reasons for opposition. This should lead to developing strategies which will broaden acceptability of this approach among clinicians and to finding means to improve its clinical effect.

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The authors declare that they have no conflict of interest related to this study,



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