7-7-2021

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MULTICENTER ASSESSMENT OF CRYOANALGESIA USE IN MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM

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Purpose
Minimally invasive repair of pectus excavatum (MIRPE) entails significant pain management challenges, often requiring high postoperative opioid use. Cryoanalgesia, which blocks pain signals by temporarily ablating intercostal nerves, has been recently utilized as an analgesic adjunct. We hypothesized that the use of cryoanalgesia during MIRPE would decrease postoperative opioid use and length of stay (LOS).

Methods
A multicenter retrospective cohort study of 19 children's hospitals was conducted of children (age < 18) undergoing MIRPE from 1/1/2014 to 8/1/2019. Demographics, surgical details, analgesic medication utilization, and 30-day postoperative outcomes were collected. Differences in total postoperative oral morphine equivalents per kilogram (OME/kg) and 30-day LOS between patients who received cryoanalgesia vs. those who did not (usual care) were assessed using univariate and multivariable generalized linear models with gamma distribution and log link, adjusting for confounders and within-center clustering. $P < 0.05$ considered significant.

Results
Of 887 patients, 135 (15%) received cryoanalgesia. Groups were similar by age, sex, body mass index, comorbidities, and Haller index. On univariate analysis, preoperative gabapentin, cryoanalgesia, continuous infusion catheters, and regional blocks were associated with lower opioid use ($P < 0.05$). However, on adjusted analysis certain adjuncts were ineffective or associated with higher opioid use; cryoanalgesia was associated with lower OME/kg vs. usual care (2.5 vs. 6.8, risk ratio [RR] 0.37 [95%CI, 0.28-0.48]) (Figure). Cryoanalgesia was also associated with a shorter mean LOS than usual care (2.6 days vs. 4.0 days, RR 0.65 [0.50-0.85]). Complications were similar between groups (29.5% vs. 21.5%, p=0.06), including a similar rate of emergency department visit, readmission, and/or reoperation.

Conclusions

Use of cryoanalgesia during minimally invasive repair of pectus excavatum appears to be effective in lowering postoperative opioid requirements and length of stay without increasing complication rates. Other adjuncts appear to increase and/or be ineffective at reducing opioid utilization. Cryoanalgesia should be considered for patients undergoing this surgery.

Figure: Predictors of opioid use in multivariable regression model adjusting for center allocation