

ORIGINAL ARTICLES

Thoracic epidural analgesia vs. intravenous analgesia after lung transplant

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ABSTRACT

Objective: Few reports have evaluated postoperative continuous thoracic epidural analgesia on patients who received a lung transplant. This analgesic modality may facilitate extubation, early ambulation, and achieve adequate pain control with minimization of opioid use. An opioid sparing technique could minimize the side effects of opioids such as ileus, constipation, and somnolence.

Methods: A retrospective chart review following local IRB approval was performed. A total of 97 patients' charts were collected, from April 2015 to March 2017. Forty-eight patients received T6-7 epidural, and forty-nine patients received standard intravenous (IV) analgesia. Outcome measures collected included length of intensive care unit stay, total duration of hospitalization, need for reintubation or noninvasive intermittent positive pressure ventilation (NIPPV), need for IV lidocaine gtt, and total narcotics consumption during hospitalization in milligrams of morphine equivalents (MME).

Results: Both groups were comparable in age, BMI, and race/gender distribution. Additionally, patient pain requirements were comparable between groups. However, a significantly smaller proportion of thoracic epidural patients required NIPPV post-operatively, (20.4%, 53.2%: $p = .0015$). Further, the number of patients requiring reintubation was almost halved, (12.5%, 21.3%: NS). Patients receiving thoracic epidural also experienced shorter ICU times ($p = .0335$) and on average, an overall reduced length of stay by six days.

Conclusions: For patients undergoing lung transplant, epidural analgesia is a viable alternative to IV pain control. Further, it significantly reduced respiratory depression and length of stay in the ICU. More refined comparisons can be made by conducting a precise prospective study with a more structured protocol in place.

Key Words: Lung transplant postoperative analgesia, Thoracic epidural postoperative analgesia, Intravenous opioids

1. INTRODUCTION

Lung transplantation is becoming an increasingly common intervention for those who are suffering from end-stage lung disease. Over the past decades, worldwide lung transplantation numbers have dramatically increased from a meager

45 transplants in 1987 to greater than 3,700 transplants in 2011.^[1] While transplant numbers have increased exponentially over the years, one year and three year survival rates within the United States have remained relatively consistent over the past decade, 85% and 65% respectively.^[1] In the

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occurrence was almost halved; significance in this case is obscured by sample size as the need for reintubation occurs in only a small subset of our sample population.

Post major thoracic trauma and surgery, TEA has been demonstrated to improve patient satisfaction,^[19] reduce narcotics consumption, and reduce the development of chronic pain as compared to IV PCA.^[20] While our results do not support reduced narcotic consumption, the results are confounded by several heavy users dramatically increasing the variance of the sample. This could be a result of these patients having developed opioid tolerance prior to transplantation. A prospective study performed by Michel-Cherqu et al. characterizing the pain of 143 patients recently placed on the waiting list for lung transplantation showed that 59% were experiencing chronic pain prior to their surgery. Of those 85 patients, 14% were using some form of opiate to and 2% were using daily opioids to manage their pain.^[21] However, as we are unable to confirm prescription opioid usage prior to surgery we cannot rightfully exclude these patients from analysis. Additionally due to the nature of retrospective chart review, data concerning patient satisfaction and pain was either inconsistent, inaccurate, or incomplete for many patients reviewed, as such its collection and analysis was precluded from this study. This may be a contributing confound to our narcotics consumption data. While SOP dictates that patients reporting a VAS pain score of 6 or higher be given supplementary analgesia and pain management was handled by the same nursing staff in both groups, we cannot quantitatively confirm equivalent analgesia between groups.

The benefits of TEA do not however come without certain

constraints. Patients undergoing lung transplantation on cardiopulmonary bypass are heparinized, as such the risk of epidural hematoma post catheter placement must be taken into account. A review of 4,583 epidural catheterizations in patients heparinized for cardiopulmonary bypass performed by Ho et al. estimates the risk of hematoma formation post-catheterization at a minimum of 1:150,000 catheterizations and maximum of 1:1,500 catheterizations.^[22] While there are several confirmed cases of spontaneous hematoma formation associated with neuraxial anesthesia in procedures utilizing cardiopulmonary bypass,^[23] to date, paraplegia, major neurological damage, and/or death due to perimedullary bleeding post-catheterization for lung transplantation have yet to be reported.^[7] In current practice, we have removed TEA from our protocols as we have started to utilize cardiopulmonary bypass for lung transplant cases. In the future, given the pulmonary and pain benefits that have been associated with TEA, we may reintroduce this analgesic method into our practice.

5. CONCLUSIONS

Our study indicates that for patients undergoing bilateral or single lung transplant, thoracic epidural anesthesia is a viable alternative to IV patient controlled analgesia for post-operative pain management. Further, it significantly reduced respiratory depression and length of stay in the ICU. More refined comparisons can be made by conducting a precise prospective study with a more structured protocol in place.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare they have no conflicts of interest.

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