Opinoin
Volume 5:5, 2022

Journal of Clinical Neurology and Neurosurgery

ISSN: 2684-6012 Open Access

Patients Undergoing Heart Surgery and Neurosurgery have an Effect on how Intensive Care Units Vary in Terms of Severity-Adjusted Resource Consumption

Chirenda Takala*

Department of Clinical Pharmacology, University of Zimbabwe, Harare, Zimbabwe

Introduction

In order to prevent death and disability in patients who are critically ill or who have undergone major, complex surgery, intensive care is necessary. Due to the high mortality of ICU patients and the high costs of ICU care, the evolution of resources required for ICU care and the evaluation of ICU performance in saving lives are of major interest. We recently demonstrated that illness-adjusted hospital mortality was significantly less severe (standardized mortality ratio; SMR) in ICU patients over time without a rise in severity-adjusted resource use ratio (SRUR) and without a wide and distinct variation in mortality and resource use between ICUs [1].

Description

Postoperatively, cardiac surgery and intracranial neurosurgery patients typically receive care in the intensive care unit (ICU) at tertiary care hospitals. Cardiovascular surgery accounted for 13% and intracranial neurosurgery and head trauma 9% of approximately 70,000 admissions in 17 intensive care units in Finland, Estonia, and Switzerland between 2015 and 2017 in our study on variation in resource utilization and outcome These two distinct groups of ICU patients are likely to have different outcomes and patterns of resource utilization from the general ICU population. After elective surgery, the majority of these patients are admitted. Mortality is low in the majority of cardiac surgery patients, who require brief but intensive care. While the evaluation of illness severity in head trauma may be hampered by sedation, many neurosurgical patients are admitted for observation with minimal treatment. It is unknown how cardiac surgery, neurosurgery, or both affect SRUR in intensive care units [2].

We previously discovered that ICU category and illness severity all influenced SRURs and SMR. In addition, the small non-university ICU category was linked to a higher SMR, and university ICUs had lower SMR ranges and higher SRUR ranges than non-university ICUs. We hypothesized that cardiac surgery and neurosurgery patients treated in university intensive care units might be a factor in this. It will be easier to compare how resources are used in different intensive care units (ICUs) and may help to optimize resource allocation if these major patient groups are understood. By separating the costs of care for these patient groups from those of general ICU patients, we assessed the relevance and contribution of cardiac surgery, intracranial neurosurgery, and head trauma to the costs of care and SRUR of multidisciplinary ICUs [3].

Similar to what was previously described our analysis approach was similar. We used frequencies (n), percentages (%), means, standard deviations (SD), medians, and percentiles to describe the study population. An analysis of variance and a chi-squared test were used to look for differences between ICU categories. By calendar year, we used box plots to describe SRUR. To investigate ICU-related factors connected to costSRURLOS and costSRURTISS, we made use of Gamma distributed hierarchical regression models with clusters on hospitals. Included were the following ICU-related variables: Based on a custom model, ICU-category (university, small/large non-university), median SAPS-II, and SMR [8] We utilized both bivariable and multivariable models, in which each of the aforementioned variables was adjusted for the calendar year. Standardized (centered and expressed per one standard deviation increase) continuous variables were reported along with relative risk estimates (RR) with 95% confidence intervals. R version 4.1.2 (R Team Core) was used for all analyses. R: A statistical computing environment and language, Vienna, Austria. (R is the R Foundation for Statistical Computing).

Regardless of the cost separation method, excluding cardiac surgery or excluding cardiac surgery and neurosurgery had no consistent effect on SRURLOS and SRURTISS across all cohorts. On the other hand, there were significant adjustments made to specific ICUs. All ICUs without in-house cardiac or neurosurgery services, or non-university ICUs and one university ICU, saw a decrease in SRURs. When the ICUs were ranked according to increasing SRURs in the overall population, the rank order for all units was the same with SRURLOS and SRURTISS. However, the responses of the ICUs with either cardiac or neurosurgery service or both were much more variable, ranging from minor decreases to significant increases in individual ICUs. The maximum change in rank from the initial was 2 in 2015–2016 and 3 in 2017 (rank increase indicating higher SRUR) after cardiac surgery or cardiac and neurosurgery were excluded. With both TISS- and LOS-based cost separation, ICUs in ranks 1–5 (high performers), 6–11 (middle performers), and 12–17 (low performers) remained the same. The only exception to this was in 2017, when three ICUs in SRURTISS-rankings (ranks 3–6) switched between being "high performers" and "middle performers" [4].

These observations suggest that intensive care for neurosurgery and cardiac surgery has a significant impact on the cost structure of multidisciplinary intensive care units and should be taken into account when evaluating resource utilization. We evaluated the effects of patient subpopulations on the SRURs by employing a novel method of SRUR analysis. As long as the total resource use (in the form of costs or other indicators) and the patient level resource use (such as LOS or TISS) are known, the same method can be used to evaluate the impact of actual or potential differences in the case mix on resource utilization. To make it easier for critical interpretation of our findings, it is necessary to address the primary characteristics of this new approach. The ratio of observed to expected resources used to produce survivors is the SRUR of an individual ICU. A subpopulation's share of each ICU's costs is subtracted from the total costs of each ICU when it is excluded. The subpopulation proportion of either TISS or LOS can be used to achieve this cost separation. The remaining population's total costs, including TISS and LOS, will decrease as a result, typically in different proportions. The observed and anticipated costs for the remaining population are recalculated using the remaining costs, TISS and LOS. As a result, the observed and anticipated

***Address for Correspondence:** Chirenda Takala, Department of Clinical Pharmacology, University of Zimbabwe, Harare, Zimbabwe, E-mail: chirenda@gmail.com*

Received: 01 September 2022, Manuscript No. jcnn-23-86330; **Editor assigned:** 03 September 2022, Pre QC No. P-86330; **Reviewed:** 15 September 2022, QC No. Q-86330; **Revised:** 21 September 2022, Manuscript No. R-86330; **Published:** 28 September 2022, DOI: 10.37421/2684-6012.2022.7.154

costs for the severity strata, as well as the mean costs of TISS and LOS, will be affected by the separation of a subpopulation [5].

Conclusion

Costs per person who survives rise with illness severity and as a result, the case mix will have an impact on costs per ICU day and per survivor. When compared to the other patients, the cardiac surgery and neurosurgery admissions had lower mean TISS score sums, shorter mean lengths of stay, and lower mortality rates. Because cardiac surgery and neurosurgery patients had lower costs per ICU day and per survivor than other patients, excluding these two subpopulations and the resources used for them results in higher mean costs per ICU day and per survivor. By adjusting the expected costs and allocating resource use to severity of illness data, the SRURs take into account the case mix effect.

References

1. Ontaneda, Daniel, Alan J. Thompson, Robert J. Fox and Jeffrey A. Cohen. "Progressive multiple sclerosis: Prospects for disease therapy, repair, and restoration of function." *Lancet* 389 (2017): 1357-1366.
2. Tamburin, Stefano, Stefano Paolucci, Francesca Magrinelli and Massimo Musicco, et al. "The Italian consensus conference on pain in neurorehabilitation: Rationale and methodology." *J Pain Res* 9 (2016): 311-318.
3. Maki, Yohko, Takashi Sakurai, Jiro Okochi and Haruyasu Yamaguchi, et al. "Rehabilitation to live better with dementia." *Geriatr Gerontol Int* 18 (2018):1529-1536.
4. Picelli, Alessandro, Stefano Tamburin, Michele Passuello and Andreas Waldner, et al. "Robot-assisted arm training in patients with Parkinson's disease: A pilot study." *J Neuroeng Rehabil* 11 (2014): 1-4.
5. Hachem, Laureen D., Christopher S. Ahuja and Michael G. Fehlings. "Assessment and management of acute spinal cord injury: From point of injury to rehabilitation." *J Spinal Cord Med* 40 (2017): 665-675.

How to cite this article: Takala, Chirenda. "Patients Undergoing Heart Surgery and Neurosurgery have an Effect on how Intensive Care Units Vary in Terms of Severity-Adjusted Resource Consumption." Clin Neurol Neurosurg 5 (2022): 154.