Author’s response to reviews

Title: Safety and costs analysis of early hospital discharge after brain tumor surgery: a pilot study

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RESPONSE TO REVIEWERS
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Guangde Tu
Editor-in-Chief
BMC Surgery

Dear Editor:

I wish to re-submit the manuscript titled “Safety and costs analysis of early hospital discharge after brain tumour surgery: a pilot study”.

We thank you and the reviewers for your thoughtful suggestions and insights. I look forward to working with you and the reviewers to move this manuscript closer to publication in the BMC Surgery.
Below is a point-by-point response letter to these comments.

Thank you for your consideration. I look forward to hearing from you.

Sincerely,

Iuri S. Neville, MD, PhD

Response to reviewers:

Reviewer 1: The authors present a pre-post intervention pilot study of a early discharge protocol in the setting of craniotomy and tumour resection.
The retrospective cohort data is an adequate control group for comparison and has been appropriately matched to the post implementation group.

The proposed discharge checklist is appropriate and generally standard of care however I do believe there needs to be more discussion on two key points prior to acceptance of publication.

Primarily this is on:

(1) Discharge destination: where are the patients, particularly those with motor deficits being discharged too. Is there an agreement between the treating institution and a rehabilitation facility to fast-track referral for patients that may not be deemed ready from a physical standpoint?
Response: There is a rehabilitation center at our institution. All the patients with neurological deficits and/or cognitive impairment are evaluated before hospital discharge and then referred to this service, where they undergo multidisciplinary rehabilitation.

(2) Where do the authors think the time saved is coming from? Currently the discussion has put some weighting on the Intensive Care Unit as an avenue to target for further cost saving, however they have not adequately discussed where they hypothesize the current effect of saved time from the policy has arrived from?
Response: Thank you for giving me the opportunity to discuss this important point. We believe that most of the time saved has came from a change in behaviour of the attending physicians of our neurosurgical team. Keeping the patient in the hospital for at least 3-4 days after brain tumor surgery used to be our routine, regardless of how well was the postoperative course. After adopting the DAHD, we became more prone to authorize patient’s release from the hospital as we started to follow a protocol with clear, objective criteria for hospital discharge from POD1. The criteria for discharging patients from ICU wasn’t changed so we do agree with you: this may be an avenue for further cost saving. We are now working on this process.

The statistical analyses are sound and I have no further issues with the data presented in the results.

Once the two above points are adequately answered I would not have any further criticisms of the play.
Reviewer 2:

1. Age is expressed in the median with the standard deviation there is a strong doubt that it is mean value and not median. Mean is expressed with standard deviation, which measures dispersion from the mean value and not a median, whereas the median is expressed with range. Kindly correct it.
Response: Age was presented as mean ± standard deviation. “Median” was corrected for “mean” in the final version of the manuscript.

2. Univariate analysis is missing in the study; only multivariate analysis is mentioned.
Response: Tables 1, 2 and 3 refer to the univariate analysis and are described on the Results section (first four paragraphs).

3. The authors should clearly mention where student T-test was utilized and where Mann Whitney test, instead of giving a blank statement that the Student T-test or Mann-Whitney test was used as appropriate.
Response: We included notes on the Tables to explicitly mention where each test was used.

4. This retrospective study with non-parametric data distribution does not fit into criteria for doing student t-test as there are no matched pairs.
Response: The Student T test was used only for the age variable, which distribution was normal.

5. ECOG PS of 3 and less corresponds to Karnofsky score of 70 and less, wonder why such a significant difference exists between the groups.
Response: Comparison between ECOG and KPS scoring systems usually do not assume the assumption that ECOG ≤ 3 is equal to KPS ≤ 70. Most of the comparisons assume that ECOG ≤ 3 is equal to KPS ≤ 40 (not 70). Please see the table below.

6. Rate of reoperation was nil in the pre-DAHD group. The incidences of major and minor complications; readmission rates were not different between both the groups. Return to the emergency department (21.9 vs. 29.4 %), the mortality rate (3.1 vs. 6.1 %) was though not significant was in favor of pre DAHD group, how does it translate in a high cost of hospitalization for the pre-DAHD group in comparison with post DHPD. Also, the overall 30 days cost remains similar.
Response: We believe that the reduction in cost of hospitalization came from the significant difference in length of stay (LOS) between the groups, since other independent variables (e.g. rate of reoperation, complications, readmissions, etc) were similar between the groups. Early discharge was achieved in 47.1% of post-DAHD patients, while only 3.1% in pre-DAHD group (p<0.001). This difference was maintained after multivariable adjustment (p=0.002).

7. What was the methodology used for calculating the total cost of hospitalization (Which should be simply the cost of ICU + cost of the ward)?
Response: Cost of hospitalization was independently evaluated by our financial department who was unaware of the adoption of a new protocol. The methodology used was Micro-costing, which is a cost estimation method that involves the direct enumeration and costing out of every input consumed in the treatment of a particular patient (in contrast to gross-costing, reimbursement, estimation of average levels).
The methodology for calculating the total cost of hospitalization for each patient was indeed simply the sum of ICU cost and Ward cost for that subject. However, mathematically, the intuitive and correct assumption that the mean of (A+B) equals the mean of (A) + the mean (B) does not hold for the median of (A+B), which is not necessarily the median of (A) + the median of (B).

“[...]Micro-costing reflects actual resource use and economic costs by collecting detailed data on resources utilized and the unit costs of those resources[...]

Further details, please see: Xu X et al., 2014 - Micro-costing studies in the health and medical literature: protocol for a systematic review