Reply to: “The impact of organ dysfunction in cirrhosis: Survival at a cost?”

To the Editor:

The danger of comparing survival rates from chronic liver disease cohorts with differing levels of organ failure severity

We thank Thomson and colleagues for their comments on our recent article [1], one of the largest prospective studies ever published on intensive care provision and cost utilisation for patients with chronic liver disease. In their letter, they correctly note the inherent difficulty in comparing different datasets. The subsequent comparisons and conclusions they make regarding better outcomes for these patients at non-transplant centres are however difficult to justify, as we will demonstrate.

We analysed 563 patients between 2000 and 2007 with a median APACHE II score of 22 [1]. Thomson et al. refer to a recently published data set [2] of 118 patients from two different London institutions without in-house liver transplantation facilities between 2007 and 2009 with a median APACHE II score of 19. While they suggest the mortality rates are different between the two datasets, this could potentially be entirely explained by differing levels of organ failure severity between the two cohorts. The APACHE II risk of death (ROD) [3,4] is designed to partly overcome the clear potential for bias in directly comparing mortality between different critical care units with different case mixes and failure to compare to the predicted mortality rate leads to inappropriate conclusions on individual unit performance. While a rudimentary tool and not validated in all groups admitted to intensive care, it is instructive to make the following cohort comparison assuming all patients met the APACHE II chronic liver disease criteria. In the Thomson et al. cohort, the predicted ROD would be 49% while their actual rate is 47%. A Chi squared test ($\chi^2$) between observed and predicted survival gives a $p$ value of 0.748. In our cohort, the predicted ROD is 55% (actual 59%) and a $\chi^2$ test again gives a non-significant $p$ value of 0.189. Therefore both cohorts have mortality rates within the range predicted for the organ severity of the admitted patients.

Secondly, comparing datasets of different chronicities is highly problematic given the significant improvement in critical care provision during the study periods of both publications. To answer this, we looked at a cohort chronologically matched to that of Thomson et al. from our institution, comprising 218 patients with cirrhosis between 31 October 2007 and 31 October 2009. The median APACHE II score was 21 with an APACHE II predicted mortality of 51% and actual mortality of 51% (obs-exp $\chi^2$ $p$ value = 1). Comparing, without APACHE II adjustment, to the cohort of Thomson et al. again demonstrated no survival difference ($p = 0.525$). However, whether this is an effect of our shared local patient base or critical care organisation is not known. All we can say is that there is no definitive statistical evidence to suggest a mortality difference between the transplant and non-transplant centres compared outside of what would be expected from the difference in underlying severity of illness. National patient level data would be required to definitively address this question.

Finally, Thomson et al. did not give information on cost utilisation at their study institutions and this was a key message of our article and one likely to be of significant importance given expansion in both critical care provision and incidence of chronic liver disease. Our primary message on the cost–benefit analysis in treating patients with chronic liver disease in intensive care is in the transplant centre setting and it would be interesting to know what the cost utilisation is at non-specialist centres. We therefore uphold the statement that given the increased number of admissions to critical care facilities expected from patients with chronic liver disease, our analysis suggests that many of these patients will benefit from admission to intensive care.

Conflict of interest

The authors declared that they do not have anything to disclose regarding funding or conflict of interest with respect to this manuscript.

References


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