

## Letter to the editor

**Treatment and outcome of acute cardiogenic pulmonary oedema presenting to an emergency department in Hong Kong: retrospective cohort study** (Hong Kong J Emerg Med 2006;13:148-54)

Dear Editor,

We read with interest Kwok et al's article "Treatment and outcome of acute cardiogenic pulmonary oedema presenting to an emergency department in Hong Kong: retrospective cohort study" and we want to raise a few comments.

We feel curious on why only 90-day mortality but not 30-day mortality was used to establish possible predictors. As the median length of hospital stay was only eight days, we predict that most of the survival cases could have been discharged within 30 days. In addition, 90 days as the end point of observation may be affected by the possibility of more repeated admissions after the initial discharge, and in this study it happened to be as high as 30%.

Secondly, the authors mentioned that univariate analysis followed by stepwise multiple logistic regression were performed to establish possible predictors. We believe that eight 'potential candidate variables' have been generated from univariate analysis (according to Table 4 of the article). However, the authors did not mention on how many and which of the eight 'potential candidate variables' were included into the final model. A table to illustrate the results of

logistic regression would be more informative to the readers.

More importantly, the authors concluded that 'a past history of hypertension' and 'higher systolic blood pressure on ED discharge' were significant predictors, however the two predictors seemed to associate with each other by common sense. The authors should establish their independency by correlation test before subjecting them to multivariate analysis as independent factors. Similarly, 'creatinine level following ED treatment' as a measure of renal function could be correlated with 'a past history of hypertension'. To convince the readers that they were independent predictors, again, a test on correlation should have been done.

Furthermore, it is difficult for us to rationalise the clinical reason why the factor 'creatinine level following ED treatment' was a significant predictor but not the factor 'creatinine level before ED treatment'. We could not see how the initial treatment in ED could have changed the creatinine level to a great extent. Could it happen just by chance or be another statistical fallacy?

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### Authors' reply

Dear Editor,

We thank Dr Kam, Dr Lau and Dr Tsui for their interest in our recent paper and we are grateful for the chance to respond.

We chose to examine factors associated with 90-day mortality as we felt that acute pulmonary oedema (APO) and heart failure were physiologically malignant

conditions with both high short-term and medium-term mortality. Indeed, this was borne out by our study, with a 30-day mortality of 12.9% and a 90-day mortality of 29.3%.

Several authors have also demonstrated these findings elsewhere. In Israel in 2000, Roguin et al reported a 12% in-hospital mortality and a one-year mortality of 40% from APO.<sup>1</sup> In the UK in 1993, Parameshwar et al

reported a 30% in-hospital mortality from heart failure and a 44% one-year mortality.<sup>2</sup> Finally, Goldberger et al showed in 1986 an in-hospital mortality of 17% with a one-year mortality of 51% from APO.<sup>3</sup>

Thus our results seem to be consistent with the published literature, confirming that acute pulmonary oedema reflects a physiologically malignant condition with a poor medium to long-term outcome. Indeed, as emergency physicians, we have to deal with the many re-attendees (30%) with recurrent APO in our emergency departments and it is useful to understand the medium to long-term prognosis in our own population given the need to make rapid management decisions which involve other critical care units such as intensive care.

The stepwise multiple logistic regression analysis identified three variables for the final model, namely higher systolic blood pressure on ED discharge, history of hypertension and lower serum creatinine following treatment. Goldberger et al showed in their study that a higher systolic blood pressure (>160 mmHg) was associated with improved survival, consistent with our results.<sup>3</sup> A history of hypertension did not automatically lead to an association with higher systolic blood pressure on ED discharge, as these patients were all subjected to antihypertensive treatment of at least one variety (nitrates, frusemide, morphine, etc.) during their ED stay.

We do agree with the final comments about serum creatinine; we agree that there is little clinical support to use this as a marker for poor outcome. Statistical significance, as we all know, is not always the same as clinical significance. This points towards the need for larger, multicentre studies of these common conditions, frequently with poor outcome, in Hong Kong EDs. Once again, we thank Dr Kam, Dr Lau and Dr Tsui for their stimulating comments.

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## References

1. Roguin A, Behar D, Ben Ami H, Reisner SA, Edelstein S, Linn S, et al. Long-term prognosis of acute pulmonary oedema--an ominous outcome. *Eur J Heart Fail* 2000;2(2):137-44.
2. Parameshwar J, Poole-Wilson PA, Sutton GC. Heart failure in a district general hospital. *J R Coll Physicians Lond* 1992;26(2):139-42.
3. Goldberger JJ, Peled HB, Stroh JA, Cohen MN, Frishman WH. Prognostic factors in acute pulmonary edema. *Arch Intern Med* 1986;146(3):489-93.