Disability, clinical complexity, and diagnosis-related groups in old patients

SIR—We read with great interest the important paper by Carpenter et al. on the relationship between physical disability, length of stay, and diagnosis-related group (DRG) reimbursement in hospitalised people [1].

We would like to contribute to the discussion on this topic presenting data obtained in 4,094 elderly patients (female = 61.5%, mean age = 79.4 ± 7.8 years) consecutively admitted to our ward. Our ward is modeled on the US ACE units [2, 3] and 78% of our patients are admitted through the emergency room.

A multidimensional evaluation, including information on demographics, cognitive and affective status, physical health, functional abilities, and social support was performed on the first day after admission using a standard protocol, by a trained staff of geriatricians. Physiological severity was computed using the APACHE II score taking into account the degree of abnormality of multiple physiological variables, age and chronic coexistent conditions (e.g. CHF, COPD, cirrhosis, renal failure, and cancer) [4]. Self-reported disability in basic activities of daily living (BADL) was assessed using the Barthel Index (BI) [5]. Seven different levels of disability were considered.

As shown in Figure 1, a decrease of BI score detected on admission paralleled an increase in APACHE II score and DRG weight.

Our data showed that the DRG values take into consideration the elderly patients’ functional status, in line with the well-known strict correlation between disease and disability in old patients.

Furthermore our data indicated that disability is correlated with APACHE II score, an indicator of disease severity, suggesting a possible pathway ‘disease severity–disability–DRG weight’, in which function is a bridge between the biological alterations induced by pathological events and the reimbursement system groups.

In our setting the increase of the DRG weight reflected the appropriateness of hospitalisation since it paralleled the increase in disability and in disease severity. At the same time, this correlation confirmed the accuracy of DRG weight in reflecting the costs induced by clinical complexity in acute care settings, where length of stay (LOS) does not seem to play a significant role in costs (in our sample it is 6.5 days). Moreover, length of stay may also explain the differences we observed between our results and the results of Carpenter et al. [1] where the LOS was 14 days. In fact, in settings performing both acute and most of the rehabilitation care, the cost differences, induced by various disability levels, are more pronounced. This requires correction of the DRG weights at variance with acute care, where the strong relationship between disease and disability shows that the disease plays the most important role in cost determination.
Letters to the Editor

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C-reactive protein and delirium in acute ill elderly patients

SIR—We have read with great interest the research letter by MacDonald et al. [1] and the related editorial by George et al. [2] recently published in Age and Ageing on the relation between C-reactive protein (C-RP) and delirium.

We would like to contribute to this topic with data obtained in a recently developed medical sub-intensive care unit (SICU) for elderly patients. Our model is developed to meet the needs of critically ill elderly medical patients who do not require global intensive care but a higher level of care than that provided in a general ward. The technological equipment of the SICU allows non-invasive monitoring of vital signs and/or intensive interventions.

From January 2004 to December 2006, 1,369 patients aged ≥60 years were admitted to SICU, mean age 77.2 ± 11 years, males 51%, Barthel index (BI) before admission 71.4 ± 31.3, BI at admission 33.0 ± 35.1, BI at discharge 51.6 ± 38.3, Mini Mental State Examination (MMSE) at discharge 20.7 ± 9.8, Charlson Index 6.0 ± 2.1, APACHE-II score 14.2 ± 6.3, APACHE-APS sub score 8.6 ± 5.9, number of drugs 7.4 ± 3.1 and length of stay in hospital 6.5 ± 5 days. Patients were assessed for delirium at admission and three times a day (until remission from delirium), using the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) [3].

Three hundred and one (21.5%) patients had delirium; 132 (9.4%) were cases of prevalent and 169 (12.1%) of incident delirium. Mean MMSE-score was 13.06 ± 10.2, was 16.7 ± 8.5 and 9.3 ± 10.5 in the total number of subjects affected by delirium and in those affected by incident and prevalent delirium respectively. Moreover prevalence of dementia was 39.7%, 15.3% and 24.3% for total, incident and prevalent delirium respectively. Mean C-RP values were 8.8 ± 9.8, 7.85 ± 9.6 and 9.6 ± 9.9 for total, incident and prevalent delirium respectively. Furthermore patients with incident delirium showed better functional status than those with prevalent, as assessed with BI 2 weeks before admission (76.02 ± 29.07 vs 61.6 ± 31.6), at admission (16.81 ± 24.9 vs 7.8 ± 18.9) and at discharge (34.9 ± 32.1 vs 14.9 ± 26.7). Also the severity of illness was found to be higher in prevalent delirium; in fact Acute-Physiology-Score (APS) was 11.6 ± 6.8, 9.4 ± 5.5 and 13.23 ± 7.3 for total, incident and prevalent delirium respectively. Comorbidity (Charlson Index score) had the same trend: 6.8 ± 1.9, 6.5 ± 1.8 and 7 ± 1.8 for total, incident and prevalent delirium respectively.

Data show that prevalent delirium, characterised by a worse health status, high disability, and, as previously reported, by a worse prognosis [4, 5] is associated with higher C-RP plasma levels, in comparison with incident delirium. This fact support the hypothesis that inflammation mediates different degree of vulnerability to delirium in older people.

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