Impact Of The Anticholinergic Risk Score (ARS) On Functional Status And Adverse Outcomes In Older Hospitalised Patients

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Anticholinergic drug prescribing scoring systems might better predict anticholinergic-related side effects. The recently developed anticholinergic risk score (ARS), calculated as the sum of the anticholinergic drug score rankings assigned for each of the medications taken by a patient, is associated with a significant increased risk of anticholinergic side effects in older outpatients (Rudolph JL et al, Arch Intern Med 2008 10;168:508-13). We speculated that a higher ARS negatively impacts also ‘global’ parameters of functional status (Barthel Index quartiles on admission) as well as outcomes (length of stay, LOS, and in-hospital mortality) in hospitalised patients. ARS on admission and daily dose of each prescribed drug were calculated in 362 consecutive older patients (age 83.6±6.6 years) admitted to two different hospital sites (Aberdeen, NHS Grampian) between February 1, 2010 and June 30, 2010. After adjusting for age, gender, dementia, institutionalisation, Charlson Comorbidity Index, hospital site, and number of non-anticholinergic drugs, for every unit increase in ARS there was a 29% reduction in the odds of being in a higher Barthel quartile than a lower quartile (OR 0.71, 95% CI 0.59-0.86, z -3.42, P=0.001). The association between ARS and Barthel Index was of a similar magnitude to other factors known to determine Barthel, e.g. age, dementia, and institutionalisation. The relationship between ARS and Barthel Index was even stronger after taking into account the daily dose of anticholinergic drugs (dose-adjusted ARS: OR 0.60, 95% CI 0.47-0.78, z -3.87, P<0.001). After adding Barthel Index category to the other variables previously listed as confounders dose-adjusted ARS did not predict either LOS (HR 1.11, 95% CI 0.97-1.28, P=0.13) or in-hospital mortality (HR 1.12, 95% CI 0.67-1.87, P=0.67). However, it strongly predicted in-hospital mortality in the presence of hyponatraemia (HR 12.36, 95% CI 2.16-70.81, P=0.005; effect for interaction: HR 0.09, 95% CI 0.01-0.56, P=0.01). These results suggest that 1) use of anticholinergic drugs adversely affects functional status as well as in-hospital mortality, particularly in the presence of hyponatraemia, in older patients; 2) the ARS, particularly when adjusted for daily dose, can be used in acutely ill patients to improve risk stratification; and 3) strategies to reduce the ‘anticholinergic load’ might prove beneficial in reducing adverse outcomes in this group.