Impact Of The Drug Burden Index (DBI) On Functional Status And Adverse Outcomes In Older Hospitalised Patients

Estelle Lowry¹, Richard J Woodman², Roy L Soiza¹, Arduino A Mangoni¹

¹Division of Applied Medicine, University of Aberdeen, AB25 2ZD, United Kingdom, ²Discipline of General Practice, Flinders University, Adelaide, SA 5001, Australia

Anticholinergic and sedative drug prescribing scoring systems might better predict drug-related side effects. The recently developed Drug Burden Index (Total DBI: anticholinergic DBI + sedative DBI; DBI: \(\sum [D/(\delta+D)]\), where D is the daily dose and \(\delta\) is the recommended minimum daily dose) is associated with poorer physical performance and functional status in community-dwelling older patients (Hilmer SN et al, Arch Intern Med 2007;167:781-7). We speculated that a higher total DBI negatively impacts also functional status (Barthel Index quartiles on admission) as well as outcomes (length of stay, LOS, and in-hospital mortality) in hospitalised patients. Total, anticholinergic, and sedative DBI on admission 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, a higher total DBI was strongly associated with a lower Barthel Index (OR 0.71, 95% CI 0.55-0.91, z -2.68, \(P=0.007\)). The association between total DBI and Barthel Index was of a similar magnitude to other factors known to determine Barthel Index, e.g. age, dementia, and institutionalisation. The negative impact of the anticholinergic component of the DBI on Barthel Index (OR 0.49, 95% CI 0.30-0.78, z -3.02, \(P=0.003\)) was stronger than the sedative DBI (OR 0.63, 95% CI 0.40-0.99, z -2.00, \(P=0.046\)). After adding Barthel Index category to the other variables previously listed as confounders the total DBI predicted LOS (HR 1.23, 95% CI 1.06-1.42, \(P=0.005\)) but not in-hospital mortality (HR 1.17, 95% CI 0.72-1.90, \(P=0.52\)). However, anticholinergic DBI weakly predicted in-hospital mortality in the presence of hyponatraemia (HR 5.51, 95% CI 0.98-30.86, \(P=0.05\)). These results suggest that 1) use of anticholinergic and sedative drugs adversely affects functional status and LOS in older hospitalised patients; 2) the anticholinergic component of DBI seems to be a major determinant of Barthel Index and in-hospital mortality, particularly in the presence of hyponatraemia; 3) the DBI can be used in acutely ill patients to improve risk stratification; and 4) strategies to reduce the ‘anticholinergic and sedative load’ might prove beneficial in reducing adverse outcomes in this group.