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Titolo tesi: Delirium in patients with ischemic and haemorrhagic stroke

ABSTRACT

Background Delirium is a frequent and serious acute neuropsychiatric syndrome and it is characterised by disturbances in attention and awareness, associated with alterations in cognitive functions (memory deficit, language, visuospatial ability, perception), which can emerge over a time frame of hours or days and it tends to fluctuate in severity over time. The prevalence and incidence of delirium, as reported in the available literature, significantly varies across studies. Moreover, it is estimated that more than 50% of delirium cases are undetected or not diagnosed. Over one hundred of different delirium risk factors have been identified and described so far, such as older age, previous diagnosis of dementia/cognitive impairment, functional, visual and/or hearing impairments, comorbidities, medications, trauma or stroke, surgery, and use of restraints or medical devices. Patients with delirium are exposed to increased risks and negative outcomes such as: higher mortality, longest length of in-hospital stay, reduced functional and cognitive decline, falls, hospital-acquired infections, pressure ulcers, functional decline and nutritional issues. As a consequence, higher number of nursing care hours, increased costs, and institutionalization have been reported.
Some patients are at higher risk of delirium development and, specifically, those who are frail and vulnerable. One of the frailest categories consists of patients admitted to medical units, who present more features or frailty conditions. Furthermore, among these patients, those with acute stroke are particularly vulnerable to delirium as a consequence of the direct cerebral insult and the occurrence of one or more acknowledged risk factors.

Aims The general purpose of this project was to expand the knowledge available regarding delirium in frail populations, as general medical patients and, subsequently, in patients with ischemic or haemorrhagic stroke. More specifically, objectives were: (a) to increase data available regarding psychomotor agitation (one of the main manifestations of hyperactive delirium) in older patients admitted in internal medicine settings, investigating incidence and predictors; (b) to map available studies regarding delirium among patients affected by stroke, identifying methodological features and gaps in research; (c) to identify delirium screening tools for patients with acute stroke and to summarise their accuracy properties; (d) to identify risk factors and outcomes of post-stroke delirium as perceived by expert nurses, on the basis of their tacit knowledge and clinical experience; and (e) to explore the post-stroke delirium prevalence, associated risk factors and outcomes.

Methods The different objectives were addressed with different sequential studies, designed as: (a) a secondary analysis of data collected from a longitudinal multicentre study on older patients admitted in 12 internal medicine units, estimating psychomotor agitation incidence and predictors; (b) considering that no synthesis on available studies has been published to date on patients with ischemic and haemorrhagic stroke, a scoping review has been performed; (c) a systematic review of the literature was carried out to identify delirium screening tools for patients with acute stroke and their psychometric properties; (d) a qualitative study involving expert nurses in focus groups was performed to explore nurses' clinical knowledge, insights and experiences regarding post-stroke delirium; then, (e) an observational pilot study performed in two Stroke Units to estimate the prevalence of post-stroke delirium, in addition to risk factors and in-hospital outcomes.

Results In the first study, among the 1464 patients included, 200 (13.6%) manifested psychomotor agitation episodes. The multivariate logistic regression analysis explained the 25.4% of the variance and identified the following variables as psychomotor agitation predictors: the risk of falls (relative risk [RR] 1.314), the amount of missed nursing care (RR 1.078) and the patient's age (RR 1.018). Factors preventing the occurrence of episode(s) were: the amount of care received from graduated nurses (RR 0.978) and the lower functional dependence at admission (RR 0.987).
The scoping review performed included 25 studies that have been published regarding post-stroke delirium to date, mainly prospective or cohort studies. The most commonly studied predisposing factors have been the older age, gender, aetiology of the stroke and its location, and the presence of previous cognitive decline/dementia. The most studied precipitating factors to date have been pneumonia, urinary tract infections and symptoms of neglect. Functional

dependence, length of in-hospital stays, post-stroke cognitive impairments or dementia, short and long-term mortality have been the most studied post-stroke delirium outcomes.

The systematic review on delirium screening tools validated among patients with stroke resulted in a total of four studies performed to date. Among these studies two tools were mainly validated: the 4-Assessment Test for delirium (4AT), reporting a range of sensitivity from 90.2 to 100% and a specificity from 64.5 to 86%; and the Confusion Assessment Method-Intensive Care Unit (CAM-ICU) showing a sensitivity of 76% (95% Confidence of Interval [CI] 55-91) and a specificity of 98% (95%CI 93-100). Other tools have been studied, resulting in lower psychometric properties values. Unfortunately, some accuracy properties were heterogeneously reported across studies thus threatening a full comparison of the findings.

In the qualitative study, performing three focus group, four categories of risk factors emerged: individuals; associated with previous (e.g., dementia) and current clinical conditions (stroke); associated with the nursing care delivered; and associated with the hospital environment. In their daily practice, nurses suspect the onset of delirium when some motor, verbal or multidimensional signs and symptoms occur. The delirium episodes affect outcomes at the individual, family, and system levels. From an expert nurses' perspective, a holistic consideration of patient needs is strongly recommended. Moreover, family are fundamental because they are able to detect small changes by comparing pre- and post-stroke conditions; also, a stable staff capable of continuously monitoring and comparing data for each individual patient is recommended.

Finally, in the observational pilot study with among 78 patients included, 27 (34.6%) developed post-stroke delirium during hospitalization which frequently started during the first day (70.4%) and lasted an average of 3.7 days (SD 2.6). Variables significantly associated to post-stroke delirium were: older age (p=0.001), previous diagnosis of dementia/cognitive impairment (p=0.015), dysphagia at admission (p<0.001), aphasia at admission (p=0.020), higher risk of falls at admission (Conley scale; p=0.004), higher pressure ulcers risk at admission (Norton scale; p<0.001), higher dependence in activities of daily living at admission and at discharge (Barthel Index; p<0.001), higher severity of stroke at the National Institutes of Health Stroke Scale at admission and at discharge (NIHSS; p<0.001). Moreover, patients who developed post-stroke delirium were more likely to have a nasogastric tube (p<0.001), a urinary catheter (p<0.001), fever (p<0.001), sedative medications (p=0.007), and were less likely to be mobilized out of the bed (p<0.001) and to be able to ambulate (p<0.001). They also showed a higher modified Rankin Scale at discharge (mRS; p<0.001) and different settings of discharge (p<0.001). The multivariate stepwise logistic regression analysis explained the 64.1% of the phenomenon variance. The only variable that could be considered a predictor of post-stroke delirium was the NIHSS score (RR 1.259, 95%CI 1.035-1.533; p=0.022).

Conclusions To identify post-stroke delirium, risk or development, in its first phases is fundamental to perform immediate and competent interventions in order to reduce its occurrence, severity or duration, potentially limiting worse outcomes and longer rehabilitation periods. This project has developed more knowledge in the field. However, evidence should be expanded: more specifically, more studies are needed to: better understand post-stroke risk factors (especially those modifiable); improve the knowledge and allow a robust selection of the most useful tool to use in this population; explore the role and efficacy of caregiver presence or other interventions potentially useful to prevent this condition.

Keywords Delirium, Stroke, Risk Factors, Outcomes, Screening Instruments, Nurses