EDA/SDA/RCPE Delirium Teaching Day
4 September 2019

Delirium Association/Royal College of Physicians of Edinburgh
Joint Conference on Delirium
5 and 6 September 2019

ROYAL COLLEGE of PHYSICIANS of EDINBURGH

Poster 11

Evaluation of delirium prevalence in acute geriatric admissions across the years: considerations on the diagnostic bias and delirium subtypes

Ana Rita Silva[1], Patricia Regueira[2], Elisabete Albuquerque[2], Ana Luísa Cardoso[1], Inês Baldeiras[4,1], Isabel Santana[1,3,4], Joaquim Cerejeira[1,2,4]

1 Center for Neurosciences and Cell Biology – University of Coimbra – Coimbra, Portugal
2 Department of Psychiatry – Coimbra University Hospitals – Coimbra, Portugal,
3 Department of Neurology – Coimbra University Hospitals – Coimbra, Portugal
4 Faculty of Medicine – University of Coimbra – Coimbra, Portugal

Introduction

Accurate estimations of delirium prevalence is crucial for adequate allocation of resources and planning of future needs. There is growing evidence suggesting that delirium occurrence can be reduced in acute geriatric wards with multicomponent interventions. On the other hand, increase life expectancy and higher comorbidity burden will lead to higher number of people susceptible to delirium in the next decades. Therefore it remains uncertain whether delirium prevalence remains stable or it is changing over time, and if is highly prevalent in this population at greater risk, thus supporting a proper plan for delirium management in geriatric wards. We currently know, by observing several epidemiological studies with delirium patients, that they conclude for different estimates of delirium frequency even if the setting is similar.

The reasons why the estimates of delirium prevalence vary across studies are unclear and that is even truer regarding the estimates of the three delirium subtypes: hypoactive, hyperactive and mixed. Mixed delirium has been reported to be more frequent than hypoactive or hyperactive delirium, but the proportion of each subtype across different settings is unknown. Several delirium risk factors in acute geriatric setting have already been identified: dementia, illness severity urinary catheterization, polypharmacy, albumin level and length of hospital stay (Ahmed 2014). So far, no systematic review has specifically estimated the pooled frequency of delirium in older people hospitalized in acute medical units.

OBJECTIVES of the STUDY
a) Determine the pooled prevalence of delirium in geriatric acute settings;
b) Estimate the delirium cases accounted for each subtype for this population;
c) Determine factors explaining the variability of estimates.

Methods

- We did an electronic search of papers using five databases of quantitative studies published between December 1999 and February 2019 (Pubmed/Medline – OVID, EMBASE, ISI Web of Science, EBSCO)
- Search words: delirium, acute confusional state, elderly, geriatric, prevalence, incidence, subtype, acute admission.

Figure 1 : Flow diagram on the meta-analysis search criteria
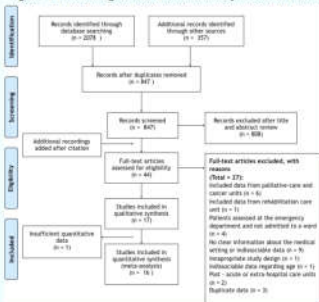
→ Inclusion criteria:
1) original investigation;
2) participants aged 60 years or older;
3) allowed data extraction for age groups;
4) included consecutive participants admitted to acute medical units during the study period;
5) used validated criteria to determine the presence or absence of delirium

→ Exclusion criteria
1) Studies conducted in surgical or intensive care units
2) Absence of clarification regarding medical setting;
3) Delirium tremens studies
4) Absence of quantitative information regarding prevalence (no percentage or proportion information).

**Table 1 : Characteristics of included studies (N=16)**

	Total	Delirium patients
Age (Mean/SD)	381.4 (6.4)	82.9 (7.2)
Diagnostic tools (%)		CAM plus DSM-IV criteria (78,4%) 4 AT (12,5%) Delirium Rating Scale – DAS (5%) Delirium Rating Scale- R- 98 (4%)
Classification of delirium subtypes (N) (total number of studies; N= 5)		Brief Psychiatric Rating Scale and Cohen Mansfield Agiation Inventory (1) Items of DRS-R-98 (2) Delirium Motor Subtype scale – DMSS (1) Only clinical observation (1)

Results

1. POOLED PREVALENCE ESTIMATES IN GERIATRIC ACUTE SETTINGS

From the 16 studies included from which we performed meta-analysis statistics, the pooled prevalence of delirium calculated was 25.6% (95% CI=19%-34%), but varying from 7% (Reynish et al., 2017) to 56% (Daly et al., 2017)
Sample size of included studies varied from 126 to 6724, so a random effects model heterogeneity analysis concluded for high heterogeneity of effect sizes - I^2 of 99.15% (95% CI=98.36, 99.67).

2. CHANGES IN DELIRIUM PREVALENCE IN GERIATRIC SETTINGS ACRROS THE YEARS

DELIRIUM PREVALENCE ACROSS THE YEARS
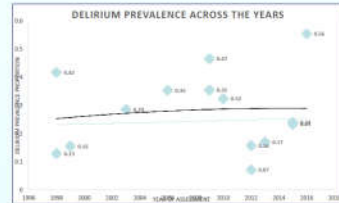
From the random effects model meta-regression analyses, we concluded that geographic location ($Q(1)$=.788, p=.322), age($Q(1)$=.430, p=.123), female/male proportion ($Q(1)$=.540 p=.142)and study year($Q(1)$=.143, p=.783) had no influence regarding delirium prevalence estimates.
We found no differences in the prevalence estimates of delirium in geriatric acute settings from the included studies across 1999 to 2019 (older study prevalence 42%, O'Keefe et al., 1999; earlier study delirium prevalence 56%, Daly et al., 2017)

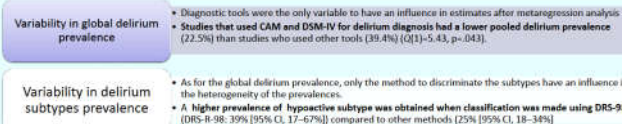### 3. PREVALENCE OF DELIRIUM SUBTYPES IN GERIATRIC ACUTE ADMISSIONS

Very few studies included data for delirium subtypes (N=5). From those, only two from the five studies included data regarding mean age, gender and lenght of stay for each subtype.
Mixed delirium was the most prevalent, but high heterogeneity was found for all subtype estimates, with hipoactive subtype reveiling publication bias after Egger analysis.

Table 1. Patients' carachteristics for each delirium subtype

	Total Sample with delirium N=1393	Hyperactive subtype	Hypoactive subtype	Mixed subtype
Proportion % (CI 95%)	100	26 (15-43)	31 (17-48)	37 (17-46)
Mean age (SD)	82.3(1.1)	83.5 (2.1)	84.3 (1.2)	84.3 (1.7)
Gender, female (%)	NA	52.7	68.5	60.3
Length of Stay – number of days	NA	10.3 (0.90)	18.2 (4.6)	15.7 (3.1)

4. VARIABILITY OF PREVALENCE ESTIMATES : INFLUENCING VARIABLES

Variability in global delirium prevalence
- Diagnostic tools were the only variable to have an influence in estimates after metaregression analysis
- Studies that used CAM and DSM-IV for delirium diagnosis had a lower pooled delirium prevalence (22.5%) than studies who used other tools (39.4%) (Q(1)=5.43, p=.043).

Variability in delirium subtypes prevalence
- As for the global delirium prevalence, only the method to discriminate the subtypes have an influence in the heterogeneity of the prevalences.
- A higher prevalence of hypoactive subtype was obtained when classification was made using DRS-98 (DRS-R-98: 39% [95% CI, 17–67%]) compared to other methods (25% [95% CI, 18–34%])

Conclusions

Main topics:
- Delirium prevalence in acute geriatric settings is 25.6% (95% CI=19%-34%) and this value has been stable during the last two decades.
- Prevalence estimates were highly variable across studies and the methodology to assess delirium was identified as a source of variability.
- The epidemiological studies analysed, despite having all good quality according with STROBE criteria, differ in a set of methodological features that can account for the variability: total sample included in the study; moment of participants' assessment; number of times patients were assessed during hospitalization, etc.
- The oscilations in delirium onset and manifestations, and the set of counfounding variables influencing its presentation makes it necessary to establish a systematic way to identify and monitor delirium in geriatric acute settings, as its prevalence is high and important for health outcomes.