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Abstract

Non-pharmacological interventions to reduce the incidence and duration of delirium in critically ill patients: A systematic review and network meta-analysis

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Abstract:

Objective: To compare non-pharmacological interventions in their ability to prevent delirium in critically ill patients, and find the optimal regimen for treatment. Methods: Literature searches were conducted using PubMed, Embase, CINAHL, and Cochrane Library databases until the end of June 2019. We estimated the risk ratios (RRs) for the incidence of delirium and in-hospital mortality and found the mean difference (MD) for delirium duration and the length of ICU stay. The probabilities of interventions were ranked based on clinical outcomes. The study was registered on PROSPERO (CRD42020160757). Results: Twenty-six eligible studies were included in the network meta-analysis. Studies were grouped into seven intervention types: physical environment intervention (PEI), sedation reducing (SR), family participation (FP), exercise program (EP), cerebral hemodynamics improving (CHI), multi-component studies (MLT) and usual care (UC). In term of reducing the incidence of delirium, the two most effective interventions were FP (risk ratio (RR) 0.19, 95% confidence interval (CI) 0.08 to 0.44; surface under the cumulative ranking curve (SUCRA)=94%) and MLT (RR 0.43, 95% CI 0.30 to 0.57; SUCRA=68%) compared with observation. Although all interventions demonstrated nonsignificant efficacy in regards to delirium duration and the length of the patient's stay in the ICU, MLT (SUCRA=78.6% and 71.2%, respectively) was found to be the most effective intervention strategy. In addition, EP (SUCRA=97.2%) facilitated a significant reduction in hospital mortality, followed in efficacy by MLT (SUCRA=73.2%), CHI (SUCRA=35.8%), PEI (SUCRA=34.8%), and SR (SUCRA=31.8%). Conclusions: Multi-component strategies are overall the optimal intervention techniques for preventing delirium and reducing ICU length of stay in critically ill patients by way of utilizing several interventions simultaneously. Additionally, family participation as a method of patient-centered care resulted in better outcomes for reducing the incidence of delirium.

The width of the lines represents the cumulative number of trials for each comparison and the size of the nodes is proportional to the number of patients to receive the intervention. Different nodes referred to different interventions accordingly. PEI: physical environment intervention; SR: sedation reducing; FP: family participation; EP: exercise program; CHI: cerebral hemodynamics improving; MLT: multi-component intervention. (a) Incidence of delirium; (b) Delirium duration; (c) The length of ICU stay; (d) In-hospital mortality.

Biography:

Luxi Deng has her expertise in evaluation and prediction of delirium in critically ill patients. She chinesized the E-PRE-DELIRIC delirium prediction model and tested the reliability and validity in Chinese population. She has years of experience in dealing with delirium in critically ill patients and recently compared different non-pharmacological interventions in their ability to find the optimal regimen for treatment.

Recent Publications:

1. Luxi D, Lan C, Yan H, et al. Application of graded nursing intervention based on the early delirium prediction model to prevent delirium in ICU patients (in chinese) [J]. Chinese Journal of Practical Nursing 2019,35(9):704-708. DOI:10.3760/cma.j.issn.1672-7088. 2019.09.015.
2. Luxi D, Lan C, Yan H, et al. Comparison of PRE-DELIRIC and E-PRE-DELIRIC delirium prediction models in ICU patients (in chinese) [J]. Chinese Journal of Practical Nursing, 2018,34(15):1172-1176. DOI:10.3760/cma.j.issn.1672-7088. 2018.15.013.
3. Deng L X, Zhang L N, Peng X B. Non-pharmacological interventions to reduce the incidence and duration of delirium in critically ill patients: A systematic review and network meta-analysis[J]. Journal of Critical Care, 2020

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