Dexmedetomidine for Prevention of Postoperative Delirium in Elderly

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The physiological changes in the perioperative period can precipitate a number of neurological complications, ranging from acute confusion and cognitive dysfunctions, to long lasting cognitive decline and cerebral vascular accidents. Postoperative delirium is an acute confusional state characterised by fluctuation; inattention and altered level of consciousness. It is associated with high incidence of postoperative complications, and lead to adverse outcomes for patients as well as increased health care costs. It is common presentation with incidence as high as 70% in certain patient groups, but due to its broad range of presentations it remains underdiagnosed in the clinical environment. Unfortunately the currently available pharmacotherapies are mostly symptom orientated are associated with a number of side effects. Dexmedetomidine is a highly selective α_2-adrenergic receptor agonist with anxiolysis and analgesic properties as well as benefit on neuro-protection. It has been demonstrated to reverse a number of pathological changes associated with postoperative delirium (POD), and shown benefits in a number of human trials. Indeed, a double-blind placebo-controlled trial published by Su et al. in Lancet (2016), investigating the effects of non-sedative doses of dexmedetomidine in the elderly population following non-cardiac surgery, demonstrated the ability for prophylactic dexmedetomidine administration to significantly reduce the incidence of delirium in the first 7-days postoperatively. The incidence of postoperative delirium in the placebo group was 23% (79 of 350 patients), whilst the incidence within the dexmedetomidine-treated cohort was only 9% (32 of 350 patients). Interestingly, the study also indicates that low-dose dexmedetomidine administration improves patients' sleep quality, decreases incidence of non-delirium complications, and increases early hospital discharge. The follow up study of this trial also indicated that dexmedetomidine improved survival up to 2 post-operative years and living quality up to 3 post-operative years (Zhang et al. Annals of Surgery 2018). It is a long-accepted belief that POD is not a treatable condition, but the work mentioned above for the first time demonstrated that POD can be prevented pharmacologically. Evidence on the anti-delirium effect of dexmedetomidine will encourage development of more pharmacological strategies, and will ultimately contribute to pharmacological breakthroughs to treat delirium and to reduce the substantial costs associated with POD worldwide.