SPECIAL ARTICLE

Postoperative delirium after cardiac surgery; incidence, management and prevention

Ali Asghar, Khalid M. Siddiqui, Khalid Ahsan, Shakaib Chughtai

Department of Anesthesiology, Aga Khan University Hospital, Stadium Road, Karachi 74800, Pakistan

Correspondence: Dr. Khalid Maudood Siddiqui, Department of Anaesthesiology, Aga Khan University Hospital, Stadium Road P.O. Box 3500, Karachi 74800, (Pakistan; E-mail: khalid.siddiqui@aku.edu

SUMMARY

Delirium is an acute neurological state branded as confusion, distraction, and varied consciousness. Other symptoms include disorientation, memory impairment, perceptual disturbances, altered psychomotor activity, and sleep disturbances. Gilman was the first person to report delirium as a complication of cardiac surgery in 1965. Despite peri-operative advancements, including both surgical and anesthetic, delirium is a frequent post cardiac surgery complication.

Delirium is a common menace in the cardiac surgical ICU and outcome consequences of greater number of morbidity and mortality. Recent research has identified possible hazards for the occurrence of delirium and strategies to treat it. However, more studies are required to standardize the risk factors, its occurrence and treatment strategies in post cardiac surgical patients.

Key words: Delirium; Confusion; Morbidity; Mortality; Complication, anesthetic

Citation: Asghar AM, Siddiqui KM, Ahsan K, Chughtai S. Postoperative delirium after cardiac surgery; incidence, management and prevention. Anaesth Pain & Intensive Care 2017;21(1):109-111

Received: 16 Aug 2016; **Reviewed:** 1 Sep 2016; **Corrected:** 4, 7 Mar 2017; **Accepted:** 30 Mar 2017

INTRODUCTION

Delirium is an acute neurological state branded as confusion, distraction, and varied consciousness.[1] Other symptoms consist of perplexity, memory loss, disruption in perception, change in psychomotor activity, and sleep disturbances.[2] Gilman was the first person to report delirium as a complication of cardiac surgery in 1965.[3] Despite peri-operative advancements, including both surgical and anesthetic, delirium is a frequent post cardiac surgery complication.[4]

Dasgupta, is 2006, reported the incidence of delirium as high as 73.5% following non-cardiac surgeries,[5] and ranging between 13.5% to 41.7% following cardiac surgery.[6] Moreover, although generally known as an acute cognitive dysfunction, delirium may have ongoing sequelae, comprising persistent cognitive deficits, dependency, functional damage, increased outlays, and increased mortality for up to 2 years.[7]

Monitoring and detection of delirium after surgery remain inconsistent, due to fluctuating course and high prevalence of hypoactive manifestations. In contrast to major neurological complications, postoperative confusion states are less noticed. Moreover, variety of symptoms overlapping with dementia and natural changes of aging brain makes the recognition of this complication extremely difficult in elderly population

Given the alarming association of perioperative delirium with morbidity, preoperative risk assessment for delirium remains the only tool to guide informed decision-making and preventative therapy.

PATHOPHYSIOLOGY

Delirium is a primarily a condition of unknown pathophysiology and etiology, with the onset caused by a possible interface of predisposing and precipitating factors. Delirium is thought ensue as an end effect of the inflammatory response and disturbances in neurotransmitter systems related to the surgical stress.[8]

In patients following cardiac surgery, development of post-operative cognitive dysfunction is hypothesized as a synergistic effect of micro emboli, hypo perfusion and rapid rewarming during cardiopulmonary bypass.[9]

RISK FACTORS

Pre-operative cognitive impairment, history of stroke, old age, peripheral vascular disease, atrial fibrillation, depression and nutritional status have been identified as risk factors for the development of post-operative delirium.[9]

Other risk factors related to hemodynamics like low cardiac output states, intra-aortic balloon pump, use of inotropes and the number of pack cell transfusion are also associated with the development of postoperative delirium.[9]

Diagnosis:

Delirium is a challenging diagnosis in the critically ill and the bulk amount of delirious patients go unrecognized.[10] Although with more than 24 instruments used for the assessment of delirium,[11] the most preferably and frequently used instrument is the Confusion Assessment Method (CAM), having a sensitivity of 94% and specificity of 89% against a gold standard of psychiatrist diagnosis.[2] CAM-ICU perfectly diagnoses delirium effectively in intensive care unit patients, who are quite repeatedly intubated and mechanically ventilated.[12] The sensitivity of CAM-ICU score is measure 95% and specificity of 89%.

PREVENTION

Both pharmacological and non-pharmacological methods have be described in literature to prevent delirium.

Non-pharmacologic approach

Lack of sleep or of poor quality, decreased ambient light and noise pollution have been implicated to contribute to post-operative delirium.[13] Whereas as early ambulation has been shown to be directly linked with decrease in the progress of delirium.[14]

A multidisciplinary mediation which has strategies on reorientation, limited usage of psychoactive drugs, early ambulation, adequate sleep and well hydration, assisted hearing/visual aids is needed to lessen the occurrence of delirium in the ICU. Similarly, proactive geriatric consultation also proves helpful.[15] However, neither of these non-pharmacologic approaches has been extensively studied and investigated in the intensive care settings.

Pharmacologic approach

The Society of Critical Care Medicine has to date no standard guidelines for the use of either haloperidol or atypical antipsychotics for the avoidance of delirium; the use of prophylactic antipsychotics is still under debate.

However, two recent trials have shown a decrease in the occurrence of delirium with prophylactic haloperidol administration patients at high risk[16,17] in non-cardiac surgery ICU patients. A study conducted in cardiac surgical patients particularly recommended the use of sublingual risperidone but randomized trials in cardiac surgical patients are still required to guarantee the merits of prophylactic antipsychotic administration.

THERAPY

The primary goal in patients at threat for delirium is to eliminate any reversible precipitating factors. Treatment regime should be reviewed and those with potential to have delirium should be restricted as much as possible. Although frequently used to decrease agitation symptoms whether antipsychotic agents actually do lessen the length of delirium is controversial. In a current systematic review mentioning serious practical constraints of the greater number of studies addressing this question having found no difference between typical and atypical antipsychotic agents in dropping period of delirium in general medical and surgical patients.[18]

In his study, Hakim S compared risperidone and placebo for post-cardiac surgical patients with sub-syndromal delirium and found the risk of progression to delirium lower in the resperidone group (14%) vs. placebo (34%).[19]

CONCLUSION

Delirium is a common menace in the post-surgical intensive care areas and fallouts in greater number of morbidity and mortality. Recent researches in such patients have identified risk factors for the occurrence of delirium and strategies to treat it. However, more studies are required to standardize the risk factors, its occurrence and treatment strategies in post cardiac surgical patients.

Conflict of interest: None declared by the authors.

Author contribution: All the authors took part in literature search and manuscript writing

REFERENCES

1. Diagnostic and Statistical Manual of Mental Disorders, 4th Ed. Washington, DC: American Psychiatric Association, 1994.
2. Inouye SK, van Dyck CH, Alessi CA, Baikan S, Seigal AP, Horwitz RJ. Clarifying confusion: The confusion assessment method. A new method for detection of delirium. Ann Intern Med 1990 Dec 15;113(12):941–948. [PubMed]
3. Gilman S. Cerebral Disorders After Open-Heart Operations. N Engl J Med 1965 Mar 11;272:489–498. [PubMed]
4. Sockalingam S, Parekh N, Bogoch II, Sun J, Mahtani R, Beach C, et al. Delirium in the postoperative cardiac patient: a review. J Card Surg 2005 Nov-Dec;20(6):560 –567. [PubMed]
5. Dasgupta M, Dumbrell AC. Preoperative risk assessment for delirium after noncardiac surgery: a systematic review. J Am Geriatr Soc. 2006 Oct(10);54:1578-89 [PubMed]
6. Koster S, Oosterveld FG, Hensens AG, Wijma A, van der Palen J. Delirium after cardiac surgery and predictive validity of a risk checklist. Ann Thorac Surg. 2008 Dec;86(6):1883–7. doi: 10.1016/j.athoracsur.2008.08.020. [PubMed] [Free full text]
7. Franco K, Litaker D, Locala J, Bronson D. The cost of delirium in the surgical patient. Psychosomatics. 2001;42:68 –73. [PubMed]
8. Inouye S. Delirium in older persons. N Engl J Med. 2006 Mar 16;354(11):1157–65. [PubMed]
9. Banach M, Kazmierski J, Kowman M, Okonski PK, Sobow T, Kloszewska I, et al. Atrial fibrillation as a nonpsychiatric predictor of delirium after cardiac surgery: a pilot study. Med Sci Monit. 2008 May;14(5):CR286–91. [PubMed]
10. Van Eijk MMJ, van Marum RJ, Klijn IAM, de Wit N, Kesecioglu J, Slooter AJ. Comparison of delirium assessment tools in a mixed intensive care unit. Crit Care Med. 2009 Jun;37(6):1881–5. doi: 10.1097/CCM.0b013e3181a00118. [PubMed]
11. Inouye SK, Westendorp R, Saczynski J. Delirium in elderly people. Lancet. 2013 Mar 8;383(9820):911-22. doi: 10.1016/S0140-6736(13)60688-1[PubMed] [Free full text]
12. Ely EW, Margolin R, Francis J, May L, Truman B, Dittus R, et al. Evaluation of delirium in critically ill patients: validation of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU). Crit Care Med. 2001 Jul;29(7):1370–9. [PubMed]
13. Arenson BG, MacDonald LA, Grocott HP, Hiebert BM, Arora RC. Effect of intensive care unit environment on in-hospital delirium after cardiac surgery. J Thorac Cardiovasc Surg. 2013 Jul;146(1):172–8. doi: 10.1016/j.jtcvs.2012.12.042. [PubMed]
14. Needham DM, Korupolu R, Zanni JM, Pradhan P, Coluntuoni E, Palmer JB, et al. Early physical medicine and rehabilitation for patients with acute respiratory failure: a quality improvement project. Arch Phys Med Rehabil. 2010 Apr;91(4):536-42. doi: 10.1016/j.apmr.2010.01.002. [PubMed] [Free full text]
15. Marcantonio E, Flacker J, Wright RJ, Resnick NM. Reducing delirium after hip fracture: a randomized trial. J Am Geriatr Soc 2001 May;49(5):516–521. [PubMed]
16. Wang W, Li HL, Wang DX, Zhu X, Li SI. Yao GQ, et al. Haloperidol prophylaxis decreases delirium incidence in elderly patients after non-cardiac surgery: a randomized controlled trial. Crit Care Med 2012 Mar;40(3):731–9. doi: 10.1097/CCM.0b013e3182376e4f. [PubMed]
17. van den Boogaard M, Schoonhoven L, van Achterberg T, van der Hoevan JG, Pickkers P. Haloperidol prophylaxis in critically ill patients with a high risk for delirium. Crit Care 2013 Jan 17;17(1):R9. doi: 10.1186/cc11933. [PubMed] [Free full text]
18. Flaherty JH, Gonzales JP, Dong B. Antipsychotics in the treatment of delirium in older hospitalized adults: a systematic review. J Am Geriatr Soc 2011 Nov;59 Suppl 2:S269–76. doi: 10.1111/j.1532-5415.2011.03675.x.[PubMed]
19. Hakim S, Othman AJ,. Early treatment with risperidone for subsyndromal delirium after on-pump cardiac surgery in the elderly. Anesthesiology 2012 May;116(5):987–997. doi: 10.1097/ALN.0b013e31825153cc. [PubMed] [Free full text]

★★★★★