Background:

The word delirium comes from the Latindeaway from + lirafurrow in afield, hence literally meaning going away from the ploughed track. Delirium is a neuropsychiatric syndrome which is transient and reversible.

It is defined as syndrome characterized by the acute onset of cerebral dysfunction with fluctuation in baseline mental status,inattention and either disorganized thinking or an altered conscious leave[1]. It is commonly under diagnosed in ICUand has a reported prevalence of 20 – 80% depending upon the severity of illness and need for mechanical ventilation[2, 3, 4, 5]. Delirium is an independent predictor of mortality[2]. Delirium is known to be associated with long term cognitive decline and early dementia and results in a threefold increase in risk of discharge to long term care. Patient with delirium has increased hospital and ICU stay and overall hospital expenses. It can be classified according to psychomotor behavior into hyperactive, hypoactive and mixed variant.

Case Summary:

A 40 year old male with no previous co morbidities presented to ER with alleged h/o RTA with complain of pain abdomen and respiratory difficulty. He was initially taken to other hospitals and later presented to our hospital. On presentation his GCS was 15/15, BP- 84/52, pulse -110/min, RR – 18/min, SPO2 – 94 on room air,RBS-580. His abdomen was tender and distended and CT abdomen revealed small bowel perforation. After initial resuscitation he was taken to OT for emergency laparotomy and repair of jejunal perforation with colostomy done. Post operative the patient was kept intubated and shifted to ICU for further management. His initial labvalues revealed high creatinine and hyperkalemia. Antihyperkalemic measures were given and nephrology consultation was taken. USG abdomen revealed AKI which resolved gradually with supportive measures. Patient's condition improved and he could be extubated on the 4th day. During stay he also developed sepsis and dyselectrolytemia which were managed accordingly and he was shifted to ward on the 8th day. In ward the patient remained persistently drowsy but was arousable and responding appropriately. He was tachypneic and tachycardic and he required 2litre of O_2 to maintain a SPO_2 more than 92. Evaluation revealed left lung (basal) atelectasis which was managed conservatively. But the patient remained drowsy. Neurology consultation was taken and the other confounding factors as electrolyte imbalance, seizure, hypoglycemia, hypothyroidism and medications were ruled out.

We considered the option of hypoactive delirium and he was given 2.5mg IV haloperidol following which his sensorium improved dramatically. Thus the patient was delerius because of hypoxia and hypoactive delirium though the most prevalent form of delerium could be easily missed and remains undiagnosed prolonging morbidity and hospital stay.

Discussion:

Hypoactive delirium is the most prevalent form of delirium and is characterized by decreased physical and mental activity and inattention[6, 7, 8]. Hypoactive delirium might actually be associated with worst prognosis[9, 10] and contributes significantly to the 22-80% of all cases of delirium that remain undiagnosed. Therefore, hypoactive delirium poses a special diagnostic challenge because the patients' inattention may seem to reflect nothing more than impaired cognitive performance. In its mildest form hypoactive delirium is associated with lethargy and can be easily missed. They are usually arousable and respond appropriately. More severe form may present as very withdrawn and almost mute. In extreme cases patient can be aroused only on painful stimulus[11]. Elderly are more vulnerable to hypoactive delirium and are associated with worst prognosis.

Delirium is usually multifactorial and can be classified based on modifiable and non-modifiable factors and few baseline risk factors associated with the development of ICU delirium are age, pre-existing dementia or other underlying brain disease, history of hypertension, history of alcoholism and increased severity of illness on admission[12,13,14].

The pathophysiology of delirium is complex and multifactorial and is poorly understood. It is thought that major etiology of integrative brain failure is hemodynamic or metabolicdecompensation elsewhere in the body. There is a growing consensus that delirium is a manifestation of cerebral insufficiency accompanied by disregulation of neurotransmitter system. An excess of dopamine or depletion of acetylcholine has been strongly implicated in the development of delirium [15,16,17]. Elevated level of serum anticholinergic activity is also associated with delirium. Cholinergic function decrease with age which may explain age is a predictive factor of delirium. Inflammation may also be an important pathway.

The gold standard for diagnosing delirium in a patient is DSM5 (diagnosis and statistical manual of mental disorder) by psychiatrist which is more possible in outpatient and limitation of its application in ICU especially if the patient is

intubated or poorly responsive. Thus 2 most validated screening tools for ICU population are CAM-ICU (Confusion Assessment Method- ICU) and ICDSC (Intensive Care Delirium Screening Checklist). Ideally CAM-ICU would be used more than once during a 24hour period to screen for delirium both during day and night while ICDSC consists of 8 components which are evaluated over a 24hours period. A score of 4 or more is considered as delirium. CAM-ICU consists of 4 components i.e. i) acute fluctuating course of mental status, ii) inattention, iii) altered level of consciousness (current RASS level), and iv) disorganized thinking. The patient must have the first two features combined with one of the last two. CAM-ICU is more sensitive and specific than ICDSC[18], also is better predictor of outcome.

Management is completely based on prevention, identification, screening and treatment. As there is no diagnostic test, it remains purely clinical and recognition of hypoactive delirium becomes more challenging. It is often missed and confused with other CNS condition such as hypoglycemia, septic, hypertensive or metabolic encephalopathy and so on. At present there is no FDA approved medication for prevention and treatment of delirium. Treatment can be broadly classified as nonpharmacological and pharmacological. Nonpharmacological measures like early ambulation, maintenance of sleep wake cycle, removal of tubing's from all bodily orifices, avoidance of physical and chemical restraints, early removal of all lines, anxiety management by reorienting the patient to ICU personnel and environment. Pharmacological management consists of proper pain management and use of appropriate sedative agent judiciously. It includes use of typical (haloperidol) and atypical (olanzepine, quetipine and risperidone) antipsychotic agent. Side effects of haloperidol like extra pyramidal side effects, neuroleptic malignant syndrome and torsades de pontis should be kept in mind. These medications may themselves cause delirium. Alpha agonist agents like clonidine, dexmedetomidine have sedative effect without GABAergic activity, potentially reducing the requirement of sedation, which itself can be deliriogenic. Benzodiazepines based sedation practices are associated with higher incidence of delirium and should be used only for delirium tremens resulting from alcohol withdrawal. As delirium in ICU is multifactorial, a bundled approach rather than any single intervention might be more fruitful. The use of ABCDE bundle (Awakening and Breathing trial, Choice of appropriate sedation, Delirium monitoring and management and Early mobility and Exercise) has been shown to decrease the incidence of delirium[12] and improve patient outcome. This is based on PAD 2013 guidelines. Although more pharmacological agents are awaited the mainstay of treatment remains minimization and removal of risk factors along with regular screening of patients.

References:

1. Reade MC, Finfer S. Sedation and Delirium in the intensive care unit. N.Engl J Med 2014;42(6):962-71
2. Ely EW, Shintani A, Truman B, Speroff T, Gordon SM, Harrell FE Jr, et al. Delirium as a predictor of mortality in mechanically ventilated patients in the intensive care unit. JAMA 2004;291(14): 1753-1762.
3. Bergeron N, Dubois MJ, Dumont M, Dial S, Skrobik Y. Intensive Care Delirium Screening Checklist: evaluation of a new screening tool. Intensive Care Med 2001;27(5)859-864 (Available at: http://www .acgme.org/acgmeweb/tabid/445/GraduateMedicalEducation/SingleAccreditationSystemforAOAApprovedPrograms.aspx. Accessed November 12 , 2016).
4. McNicoll L, Pisani MA, Zhang Y, Ely EW, Siegel MD, Inouye SK. Delirium in the intensive care unit: occurrence and clinical course in older patients. J Am Geriatr Soc 2003;51(5):591-598 (Available at:http://www.acgme.org/acgmeweb/tabid/445/GraduateMedicalEducation/SingleAccreditation SystemforAOA-ApprovedPrograms.aspx. Accessed November 12 , 2016).
5. Girard TD, Pandharipande PP, Ely EW. Delirium in the intensive care unit. Crit Care 2008;12(Suppl. 3):S3.
6. Arrowsmith JE, Grocott HP, Reves JG, et al. Central nervous system complications of cardiac surgery.Br J Anaesth 2000;84:378–393.
7. Hogue CW, Barzilai B, Pieper KS, et al. Sex differences in neurologic outcomes and mortalityafter cardiac surgery: a Society of Thoracic Surgery national database report. Circulation 2001; 103:2133–2137.
8. McKhann GM, Grega MA, Borowicz LM, et al. Encephalopathy and stroke after coronary bypassgrafting. Arch Neurol 2002;59:1422–1428.
9. Alpagut U, Dayioglu E. Anterior spinal artery syndrome after infrarenal abdominal aortic surgery.J Cardiovasc Surg (Torino) 2002;43:865–868.
10. Gopalan PD, Burrows RC. Critical care of the vascular surgery patient. Crit Care Clin 2003;19:109–125.
11. Plum F, Psoner JB. The diagnosis of stupor and coma. 3rdedn Philadelphia, Davis, 1980
12. Barr J, Fraser GL, Puntillo K, Ely EW, Gelinas C, Dasta JF, et al. Clinical practice guidelines for management of pain, agitation and delirium in adult patient in the intensive care unit: executive summary. Am J Health Pharm 2013
13. O'Mahony R, Murthy L, Akunne A, Young J. Guideline development group. Synopsis of the national institute for health and clinical excellence guideline for

prevention of delirium. Ann Intern Med. 2011.
14. Inouye SK, Westendorp RGJ, Saczynski JS, Pun BT, Wilkinson GR, Dittus RS. Delirium in elderly people. Lancet. 2014.
15. Hshieh TT, Fong TG, Marcantonio ER, et al. Cholinergic deficiency hypothesis in delirium: a synthesis of current evidence. J Gerontol A Biol Sci Med Sci 2008;63(7):764-72.
16. Page VJ, Ely EW, Gates S, et al. Effect of intravenous haloperidol on the duration of delirium andcoma in critically ill patients (Hope-ICU): a randomised, double-blind, placebo-controlled trial.Lancet Respir Med 2013;1(7):515-23.
17. Brooks JM, Sarter M, Bruno JP. D2-like receptors in nucleus accumbens negatively modulate acetylcholinerelease in prefrontal cortex. Neuropharmacology 2007;53(3):455-63.
18. Gusmao-Flores D, Salluh JI, Chalhub RÁ, et al. The confusion assessment method for the intensivecare unit (CAM-ICU) and intensive care delirium screening checklist (ICDSC) for the diagnosis of delirium: a systematic review and meta-analysis of clinical studies. Crit Care 2012;16(4):R115.

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