



Neurological Complications After Surgery

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Postoperative neurological complications are gaining worldwide attention due to medico-legal aspects and more importantly long term functional outcomes that are detrimental especially in the elderly population with increased mortality and financial burden on society. Hence, it becomes necessary to identify risks and take measures that would decrease chances of peri operative and post operative surgical complications.

There can be two types of complications, one that affect thought processes and the other that cause direct damage to body systems. Broadly speaking major surgeries including cardiovascular, neurosurgery, hip replacement surgery, shoulder replacement surgery, bariatric surgery are all subject to complications but neurological complications as a consequence of these surgeries are somewhat more unpredictable as main focus is on treating the primary cause. CABGs have up to 5% clinical evidence of stroke post operatively and risk increases in recurrent bypasses. Seizures may happen in less than 0.5% while peripheral nerve injuries in upto 13% of the cases. Bariatric surgery can have complications up to 5% including Wernicke's encephalopathy most of these being a consequence of micronutrient deficiency. According to one study 2% of all surgical patients might suffer permanent nerve injury. Shoulder replacement surgery can have a temporary nerve damage of up to 21%. There could be numerous causes for intraoperative and post operative complications both dependent on site of surgery, intraoperative bleeding, duration of surgery, hyper or hypothermia, electrolyte imbalance, rate of decline in haemoglobin during surgery. Post operative causes may include delayed ambulation, severe pain or even the use of bed sensors. There are some modifiable factors such as blood pressure as it is seen that patients developing

post operative stroke whether it is ischaemic or hemorrhagic, have mean arterial pressure of greater than 80 mmHg. Even intraoperative hypotension is associated with the risk of major post operative cardiac or cerebrovascular events and short exposure to mean arterial pressure of 55 to 65 mmHg is significantly associated with post operative adverse cardiovascular events while maintaining systolic blood pressure within 10% reference range value may prevent post operative adverse events compared with standard treatment. It has been seen that EEG guided anaesthetic administration as compared with usual care also failed to decrease the incident of post operative delirium.

Besides these complications elderly patients can have post operative delirium, post operative cognitive dysfunction, post operative ischaemic stroke and hemorrhagic stroke. In post operative delirium there could be confusion or disorientation or perceptual disturbance, emotional or sleep disturbances. In the confusion assessment method CAM-ICU in post anaesthesia care units (PACU) four symptoms have been noted such as acute onset fluctuating course of mental state, secondly attention deficits, thirdly disorganised thinking and fourthly altered level of consciousness. In post operative delirium (POD) first and second symptom should be present and other two maybe be elective. Post operative cognitive decline which usually occurs for greater than one month and less than one year is seen, more in patients over 60 years of age. Then there are memory and language problems, covert stroke which can increase risk of overt stroke, post operative dementia or transient ischaemic attacks during one year follow up. In hemorrhagic type of stroke which may occur due to hyper perfusion in patients having hypertension which is the most common risk other risk factor,

others include age greater than 65 years or incidence of COVID-19. Comorbidities add up to the risks which may include cardiovascular disease, peripheral vascular disease, diabetes mellitus, Anaemia, Parkinson's disease, depression, chronic pain, anxiety, renal failure or alcoholism or even dehydration, electrolytic imbalances or blood transfusions and use of quinolones. Neuroapoptosis can occur due to long exposure to anaesthesia leading to long lasting impairments in neuronal communications and faulty formation of neural circuitry. Certain tests can be performed to ascertain the condition of nerves which are like electromyography, ultrasound imagery of nerves, magnetic resonance neurography, nerve conduction velocity studies.

We have to identify risk factors than can lead to neurological complications. It is better to prevent them in earlier stages because this is more effective than the treatment for prognosis. Prospective trials should be able to gain deeper understanding of mechanisms and the contributing factors underlying neurological complications [1-3].

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