Anaesthesia Perspectives on Neurological Surgery: Cerebral Comfort.

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Introduction

Anaesthesiology is a constantly evolving science, and among its sub-specialties, neuroanaesthesia is making significant progress. The brain and spinal cord's fragility, as well as the numerous intricacies involved in neurosurgery and interventional neuroradiological treatments, necessitate specialised training in neuroanaesthesia. Neuroanaesthesia, like other neuroscience disciplines, has advanced rapidly, thanks to the introduction of structured training, the publication of high-quality scientific research, and the development of innovative drugs and monitoring techniques. Over the last two decades, there has been an increase in training possibilities in India and overseas, as well as resources to widen understanding in neuroanaesthesia. Neuroanaesthesia is a promising field for aspiring anaesthesiologists.

Consider a world in which the complexity of the neurological system collide with the artistry of medical science. Anesthesiologists are the architects of peace in this setting, conducting a symphony of drugs and monitoring equipment to assure the comfort and safety of each patient undergoing neurological surgery. As we journey through "*Cerebral Comfort*" we will discover the fascinating junction of neurology and anaesthesia. This is a field that necessitates not only clinical expertise but also a thorough understanding of the brain's complexities, sensitivities, and crucial role in consciousness [1].

In the previous decade, significant technological advances in diagnostic and interventional neurosciences have happened. Neuroanaesthesia and neurocritical care specialists have attempted to use these new developments in order to improve patient treatment and results. We used a word search to scan the literature on Google Scholar, Embase, MEDLINE, and PubMed for contemporary practises in neuroanaesthesia and neurocritical care across the most prevalent neurological and neurosurgical indications for sedation, anaesthesia, and critical care services. Based on this research, we examined recent advances in neuroanaesthesia and neurocritical care that have been translated into clinical practise [2].

Ketamine use is on the rise due to a better knowledge of its effect on improving cerebral perfusion pressure and lowering Intracranial Pressure (ICP). Ketamine is being studied for its utility in ameliorating cerebral infarction during thrombolytic therapy in acute ischemic stroke at a dose of 0.15 mg/kg Intravenous (IV) bolus (maximum 15mg) followed by an IV infusion of 0.15 mg/kg over 60 minutes (maximum 15mg). Ketamine is being studied in subanesthetic doses in patients with aneurysmal subarachnoid haemorrhage. Ketamine has been postulated to operate as a neuroprotectant by exerting analgesic, anti-inflammatory, sympathomimetic, anti-seizure, and sedative effects, consequently lowering cerebral ischaemia. Ketamine's effect in avoiding delayed cerebral ischaemia via inhibition of cortical spreading depolarisations is also being investigated.

This N-methyl-D-aspartate (NMDA) receptor antagonist's anti-seizure function qualifies it for use in the management of super-refractory status epilepticus in adult and paediatric patients at a dose of 1-3 mg/kg/h. Rescue therapy with sub-anaesthetic dosages of ketamine has helped patients with treatment-resistant depression, and its usage in electroconvulsive therapy is promising. The evaluation of the safety and efficacy of ketamine for sedation, induction, and anaesthetic maintenance after traumatic brain injury provides promising results. Deep Brain Stimulation (DBS) functional neurosurgeries were initially utilised to treat Parkinsonism. Movement disorders (essential tremor, dystonia, myoclonus, chorea, torticollis, spasticity), chronic pain (trigeminal neuralgia, cluster headaches, cancer pain, chronic pain syndromes), psychiatric disorders (chronic depression and obsessive-compulsive disorders), multiple sclerosis, and refractory seizures are now included in their application [3].

Anaesthetic drugs have an effect on Microelectrode Recording (MER), which is used to locate distinct brain nuclei. Benzodiazepines, barbiturates, volatile agents, propofol, thiopentone, and etomidate all interfere with MER by amplifying the inhibitory effects of gamma-aminobutyric acid inside the basal ganglia. Dexmedetomidine has been shown to be a dependable anaesthetic adjunct for maintaining anaesthesia during MER. Despite the fact that these procedures are typically performed under MAC, research comparing GA to MAC have revealed that both are efficacious, with satisfactory surgical outcomes.This N-methyl-D-aspartate (NMDA) receptor antagonist's anti-seizure function qualifies it for use in the management of super-refractory status epilepticus in adult and paediatric patients at a dose of 1-3 mg/kg/h [4].

Rescue therapy with sub-anaesthetic dosages of ketamine has helped patients with treatment-resistant depression, and its usage in electroconvulsive therapy is promising. The evaluation of the safety and efficacy of ketamine for sedation, induction, and anaesthetic maintenance after traumatic brain injury provides promising results. To successfully handle

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the problems of neurosurgery, neuroanaesthesia techniques have evolved. Methods previously thought to be hazardous, like as the use of ketamine in neurosurgical patients, are now being incorporated into perioperative treatment regimens. Intraoperative neuromonitoring for both brain structures, in the form of intraoperative computed tomography and iMRI, is now being prioritised. Anaesthesia for functional neurosurgery, operations requiring neuronavigation, and regional anaesthesia for neurosurgery are also advancing. The role of the neuroanaesthesiologist has increased outside of the operating room in scenarios such as acute stroke care and other neurocritical areas, and it is projected to develop further in the coming years [5].

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