Available online at www. scholarsresearchlibrary.com

Scholars Research Library

Der Pharmacia Lettre, 2023, 15(2): 03-04
(http: //scholarsresearchlibrary. com/archive. html)

ISSN 0975-5071
USA CODEN: DPLEB4

Modes of Action of General Anesthetic Drugs

Zara Natalia*

Department of Pharmacy, University of Yale, New Haven, United States of America

***Corresponding author:** Zara Natalia, Department of Pharmacy, University of Yale, New Haven, United States of America; E-mail: zaranatalia@gmail.org*

***Received:** 01-Feb-2023, Manuscript No. DPL-23-91672; **Editor assigned:** 06-Feb-2023, PreQC No. DPL-23-91672 (PQ); **Reviewed:** 20-Feb-2023, QC No.DPL-23-91672; **Revised:** 27-Feb-2023, Manuscript No. DPL-23-91672 (R); **Published:** 06-Mar-2023, DOI: 10.37532/dpl.2023.15.03.*

DESCRIPTION

Anesthesia is a medical practise that prevents the patients from feeling pain while undergoing procedures or surgery. An anesthetic is the name of the drugs that is used to block pain. Various anesthetic types function in various ways. Certain anesthetic drugs numb specific body areas, while others numb the brain in order to induce sleep during more invasive surgical procedures, such as those carried out on the head, chest, or abdomen.

For the purpose of enabling surgeons to perform surgery, general anesthetics are used. General anesthetics are drugs that temporarily knock a patient out of consciousness and render them unresponsive. Typically, the general anesthetics are given intravenously or orally by a trained physician known as an anesthetist who also keeps an eye on the patient's vital signs (breathing, heart rate, blood pressure, temperature) throughout the surgery. With a general anesthetic, a patient is not aware of any discomfort and is likely to awaken with some short-term forgetfulness (memory loss).

Drugs used for general anesthesia do not yet have a fully understood mechanism of action. Since the mid-1800s, numerous hypotheses have been accepted. Initially, it was believed that the anesthetic effects of inhaled ether were due to disruption of the lipid bilayer that lines neuronal cell membranes. However, it is now known that general anesthetic medications, both inhaled and intravenously administered, act on particular ion channels found within neuronal cell membranes. The suggested activities of common anesthetic drugs with the overall effect of central nervous system depression include activation of inhibitory Gamma-Amino Butyric Acid type A ($GABA_A$) receptors and inhibition of excitatory N-Methyl-D-aspartate Receptors (NMDA).

The inhibitory neurotransmitter found most frequently in the central nervous system is Gamma-Amino Butyric Acid (GABA). The ability of a nerve cell to make, receive, or send chemical signals to other nerve cells is reduced by GABA. The soothing effects of GABA are well established. It is believed to have a significant impact on how well anxiety, tension, and fear are managed. Many neurological, psychiatric, and other medical disorders, as well as other medical conditions, are linked to decreased GABA levels. GABA augmentation may be used to treat conditions like diabetes, sleeplessness, and high blood pressure.

Neurosteroids, ethanol, pathological states including epilepsy and neurodegenerative disorders, and these receptors are all controlled by $GABA_A$ receptors. Conditions that change the amounts of subunit mRNA, promoters that regulate those levels, and a variety of transcription response elements can all have an impact on the controlled expression of the $GABA_A$ receptor subunit. Gephyrin is one of many proteins that can influence how $GABA_A$ receptors are expressed. A key element of the postsynaptic machinery that helps to stabilise $GABA_A$ and glycine receptor clusters at the synapses is the kDa membrane protein known as gephyrin. Gephyrin is preferentially linked with GABAergic synapses in a number of brain areas, but it seems to be localised at glycinergic synapses in the brainstem and spinal cord. Several different factors and processes can phosphorylate the intracellular regions of $GABA_A$ receptor subunits.

The N-Methyl-D-aspartate Receptors (NMDA) receptor is an ion-channel receptor that is present at the majority of excitatory synapses and, as a result, is a member of the glutamate receptor family. It is activated by the neurotransmitter glutamate. Glutamate, the main excitatory neurotransmitter in the human brain, is a receptor for the N-methyl-D-aspartate molecule. It has a crucial part to play in synaptic plasticity, a neuronal process thought to be the foundation of memory formation. A phenomenon known as excitotoxicity also seems to be a function of NMDA receptors. Many disorders, including epilepsy and Alzheimer's disease, may have excitotoxicity as a pathophysiologic component. Ketamine and phencyclidine, two widely abused substances, are two of the many medications that block NMDA receptors. On the central terminals of primary afferents and on membranes that are postsynaptic to the primary afferent, respectively, in the superficial and deeper laminae of the spinal dorsal horn, exist NMDA receptors.

The local anesthetics work well and are safe. The highest level of patient safety and satisfaction can be attained by being aware of the effects and combinations of this class of medications. In actuality, anesthetics have specific, dose-dependent effects on the brain systems that support internal consciousness and perception of the environment rather than generally impairing brain function. Each substance has a unique mode of action and causes various phenomenological altered consciousness states in a dose-dependent manner.