



Unicorn of Anesthesia: Can Mythical cumulative electromagnetic Vector of Human Brain explain induction- Reversal of Anesthesia?

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Abstract

There is a popular "myth" that once upon a time, there was an animal "Unicorn" with single horn arising from its forehead and it existed during the ancient civilizations thousands of years ago as presumably depicted in the excavated symbols from those civilizations. It is our perspective that the mythical ancient animal "Unicorn" brings forth a mystical-yet-scientific possibility: the cumulative electromagnetic vector of human brain, its projected direction from the forehead and the changes in its direction with medications or methods that may explain induction and reversal of anesthesia as well as natural sleep-wakefulness correspondingly.

Perspective

There is a popular "myth" that once upon a time, there was an animal "Unicorn" [1-3] with single horn arising from its forehead and it existed during the ancient civilizations thousands of years ago as presumably depicted in the excavated symbols from those civilizations. Some can say that it could be a case of mistaken-identity wherein the rhinoceros' nose-horn got depicted as forehead-horn in the ancient popular lore. Others can say that the impression of two-horned animal in lateral view mistakenly got depicted as an artifact of one-horned animal in the excavated symbols. Irrespectively, the mythical ancient animal "Unicorn" with its modern-day human misnomer ("Unicorn Woman") given to an Old Age Pensioner (OAP) Chinese woman [4] with single cutaneous horn brings forth a mystical-yet-scientific possibility: the cumulative electromagnetic vector of human brain, its projected direction from the forehead and the changes in its direction [Figure 1] with medications or methods that may explain induction and reversal of anesthesia as well as natural sleep-wakefulness correspondingly.

The scientific community in general and the anesthesia provider community in particular have always been mystified by the mechanism underlying

the induction and reversal of anesthesia. As a part of anesthesia care provider team, our theoretic-explorative thought process has been envisioning and slowly warming up to the phenomenon of bio-magnetism with its effects on human brains when they are being anesthetized. Our line of thinking got great impetus when attended awe-inspiring guest lecture by Professor Perouansky, who (if we are remembering correctly) described the consciousness in the simile as a matter-matrix that changes its shape with the induction of anesthesia but reverts back to its original state with the emergence from anesthesia. Consequently, the idea dawned to us that what if the answer to the enigmatic mechanism of anesthesia lies in the electromagnetism of human brain [5]. Irrespective of the molecular physiology of the naturally-occurring phenomenon called sleep and artificially-induced phenomenon called anesthesia, the outcome (result) of those molecular changes within the cells of the brain must ultimately be leading to the changes in the electromagnetism of human brain, which can be deciphered in the electro-encephalography [6] and magneto-encephalography [7] by the advanced instruments and interpreted by the trained specialists. To further delve into our thought processes, reading the book by Becker and Selden titled "The Body Electric: Electromagnetism and The Foundation of Life" [8] was an eye-opener because Dr Becker had documented and illustrated his experiments with the non-complex simplistic brains of salamanders who had gotten anesthetized by simply changing the polarity of a magnet surrounding them. What it can mean is that there may be an electromagnetic polarity with the whole body acting as a diode itself, and similarly there can exist an electromagnetic polarity with the fronto-occipital cortex acting as a diode; and this polarity may be reversibly reversed during the sleep and/or by the induction of anesthesia, with the baseline polarity getting restored once the human brain wakes up from sleep or emerges from anesthesia.

In a nutshell, the sum-of-all-activity in the human brain can be cumulatively represented in the

sum-of-all-electromagnetic vectors projecting as a result of all cellular molecular activities. What it means for the future researchers is that they have to sum-up-all the vectors that they derive in each of 102 magnetometers/gradiometers (102-array) [9-10] possibly in each of the three dimensions x-, y-, z- plotted over the time in the magneto-encephalographs. So this 10^{-15} T (tesla) to 10^{-12} T (tesla) amplitude magnetic field derived in each of the three dimensions (xyz) can be summated [11] from each of the 102 projected "sites" at each given point of time to derive one summated vector (with its amplitude and direction) for each point of time.

The easiest way to validate or refute this hypothesis can be as follows:

DAY 1:

Firstly, the intuitives would have to plan and perform a human volunteer study wherein the magneto-encephalographs would have to be collected and individually summated [Figure 2] to see if the 102-array vectors (with their amplitudes and correspondingly representative direction in the three-dimension matrix) consistently derive a narrow range for time-sensitive cumulative electromagnetic vector' amplitude of human brain (as well as a narrow range for its time-sensitive projected direction in the three-dimension matrix) across the representative sample of studied human volunteers.

DAY 2:

Secondly, the cross-over study within the same human volunteers would have to be planned to see how this time-sensitive cumulative electromagnetic vector's amplitude with its direction changes (sways) while these volunteers would go through the five-stages of one-hour daytime sleep (nap) and then wakefulness, presuming the human volunteers' ability to naturally and comfortably fall asleep within the magneto-encephalography scanner.

DAYS 3-4:

Finally, the cross-over study within the same human volunteers would have to be planned to see how this time-sensitive cumulative electromagnetic vector's amplitude with its direction changes (sways) as these volunteers would undergo the induction and maintenance of anesthesia with (a) intravenous anesthetic agent-propofol (DAY 3 or DAY 4) vs. (b)

inhalational anesthetic agent-sevoflurane (DAY 4 or DAY 3), along with the reversal (literally meaning the cessation of anesthetic agent administration) of anesthesia initiated after a total of one-hour anesthetic agent administration.

It is our understanding that the chemical molecules are the causative agents for the changes induced by the medications given artificially to produce anesthesia. However, if the final outcome (the intended change in the human brain) eventually is supposedly the electrical and corresponding magnetic changes within the firing neurons which are supposedly aligning (during the sleep and/or the anesthetic state) and re-aligning back (during the awake state and/or the emergence) to create various states of changed consciousness, then the induction of electromagnetic field changes without any medications could be able to induce anesthesia (logically and directly). As these futuristic instruments to induce the chemical-molecule-independent anesthesia electromagnetically may be much more cumbersome and have to be extremely dynamic to constantly accommodate the ever changing electromagnetic milieu of brain as a whole and the individual sets of firing neurons in particular, we may be presently bound to only follow/understand the molecular way (that are much easy to modulate with the pharmaceuticals) to achieve the changes required to create the anesthetic state as currently known and taught to the humans.

Who knows whether the recurring images of "Unicorn" from the ancient lore and unique "Unicorn woman" emerging in the modern media are trying to draw the attention of mystic thinkers and out-of-box theorists to see if the uniqueness of direction (50-60 degrees from forehead) projected by these images are indicating towards the direction of the cumulative electromagnetic vector's amplitude of the human brain. It may seem that the time may have come to decipher the "Unicorn of Anesthesia".

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Illustrations

Illustration 1

Figure 1: Schematic and Hypothetic Depiction of Mythical Unicorn of Anesthesia Swaying Between Two Directions

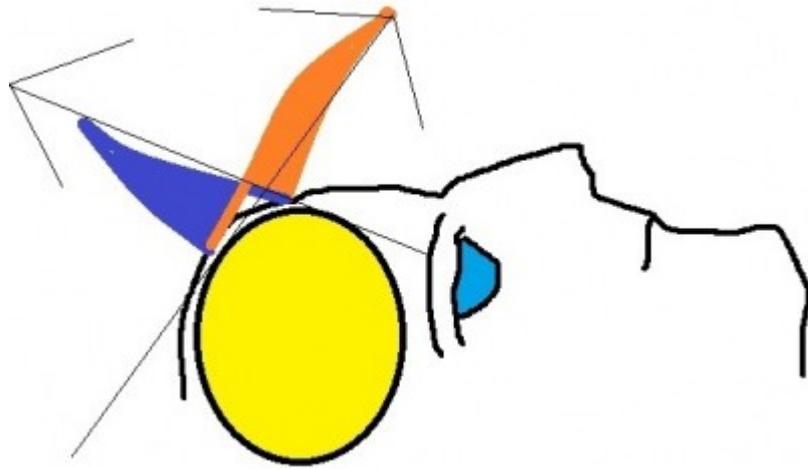


Illustration 2

Figure 2: Possible Summation Formula to Calculate Cumulative Electromagnetic Vector of Human Brain Based on Magnetoencephalography Recordings

$$\text{Three-Dimensional Resultant Vector: } \vec{R}_{xyz} = \sum_{xyz=1}^{102} \vec{V}_{xyz} = \sum_{x=1}^{102} \vec{V}_x + \sum_{y=1}^{102} \vec{V}_y + \sum_{z=1}^{102} \vec{V}_z$$