

# Consciousness is Quantum Computed Beyond the Limits of the Brain: A Perspective Conceived from Cases Studied for Hydranencephaly

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## ABSTRACT

Hydranencephaly is a developmental malady, where the cerebral hemispheres of the brain are reduced partly or entirely too membranous sacs filled with cerebrospinal fluid. Infants with this malady are presumed to have reduced life expectancy with a survival of weeks to few years and which solely depends on care and fostering of these individuals. During their life span these individuals demonstrate behaviours that are termed “vegetative” by neuroscientists but can be comparable to the state of being “aware” or “conscious”. Based on the most simplified definition for consciousness i.e. “awareness” or “to be aware”, these individuals are undeniably aware of their existence and therefore should be termed “conscious”. The bigoted approach of neuroscience towards understanding consciousness is usually linked with the cortex of the brain and therefore a malady as hydranencephaly poses a great challenge to this field. This paper is a compilation of behaviours and aptitudes observed in several cases of hydranencephaly which suggests, that consciousness is not just a brain process, but is a highly quantum computed process that follows laws of quantum physics, giving rise to the subjective experience of consciousness in these individuals.

**Key Words:** hydranencephaly, consciousness, brain, quantum brain

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## 1. Introduction

Neural disorders pose a big challenge in the field of neuroscience and sometimes challenge the parochial attitude of this discipline. The brain is a highly complex organ and there are many hidden inscrutabilities within this piece of flesh, with

new findings every single day. Neuroscientific studies in cognitive and consciousness are extensive and have helped individuals overcome their suffering from several neural based disabilities (Lieberman, 2007; Holzel *et al.*, 2011), but consciousness related studies still remain enigmatic, as the

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term consciousness itself is not clearly defined (Lamme, 2010). Consciousness has several theories and several definitions both local and non-local, but for this paper the simplest definition of consciousness has been considered i.e. “awareness” or “to be aware” and the understating behind this definition is “awareness associated with the experience of what lies around and the ability to emote what has been experienced” (Searle, 2005). Several studies have been conducted by neuroscientists to prove that the existence or emergence of consciousness lies in the brain or rather to be more specific, the cortex of the brain, which until date still remains inconclusive and is therefore open for speculations (Crick and Koch, 1998; Dehaene and Naccache, 2001; Kurthen *et al.*, 1998; Desmurget, 2013).

Cognition and consciousness seem correlated but are definitely two discrete fields and therefore should not be wholly directed to the brain and its systems. This may not be all that true for consciousness but for cognitive capabilities, the brain is surely responsible and manages complex cognitive functions directly related with the neural connections of the brain (Glisky, 2007; Chapman *et al.*, 2013; van den Heuvel, 2013). Consciousness is enigmatic and so there is a possibility of its presence being beyond the brain until the field of neuroscience is capable of determining the exact location of its origin in the brain. To support the argument of consciousness beyond the brain, this paper considers the case of hydranencephaly where the cerebral hemispheres of the brain is reduced partly or entirely too membranous sacs filled with cerebrospinal fluid. The behaviours and capabilities observed in several cases of hydranencephaly have challenged the existence or emergence of consciousness in the brain leading to a new era of combination of biology, physics, neuroscience and several other disciplines in understanding alternative or capability transfers through quantum computation of consciousness as a means of survival.

## 2. Hydranencephaly and its characteristics

Hydranencephaly is a developmental malady, where the cerebral hemispheres in the cortex region of the brain are reduced completely or partially to a membranous sac filled with cerebrospinal fluid (Global Hydranencephaly Foundation). This was first described by Cruveilhaer (1982) as “Anencehalie hydrocephalique” or “Hydroanencephalie” which was further defined as a congenital condition by Crome and Sylvester. It is a rare disorder and occurs in less than 1 per 10,000 births worldwide. The cerebral cortex is absent with a partial preservation of a portion of the occipital lobes but this may differ from case to case. The midbrain, thalamus, basal ganglia, choroids plexus, cerebellum and brain stem are usually intact and are contained within the skull. Falx cerebri may either be partially present or absent but the septum pellucidum is always absent (Hamby *et al.*, 1950; Cecchetto *et al.*, 2013). The myth or assumption about hydranencephaly or hydranencephalic state due to the absence of a functioning cortex is that this state is associated with a lack of consciousness and cognitive state (Rays of Sunshine, HIN).

The occurrence or emergence of hydranencephaly is prenatal and is related to either a developmental or encephaloclastic process, more often due to an infection, toxic or genetic origin that affects the vessels for circulation. Despite, the number of case reports available for this anomaly, most pathogenic, phenotypic and prognostic aspect remains controversial. Clinically, the infants appear normal in the first two weeks of life unless there is an enlargement in the head. The infant’s head size and spontaneous reflexes such as sucking, swallowing, crying and moving of arms and legs seem normal at birth. Changes in growth and development are usually observed in the first month which reduces considerably. Facial features appear normal and therefore can be easily distinguished from other central nervous system maladies. After a few weeks, the infants become irritable and after a few



months' seizures and hydrocephalus conditions develop along with other symptoms which may include visual impairment, lack of growth, deafness, blindness and paralysis (Cecchetto *et al.*, 2013; Pant *et al.*, 2010; Onankpa *et al.*, 2014; Pavone, 2014).

The effects observed in cases related to hydranencephaly differ from individual to individual and are wholly based on the availability of the cerebral cortical tissue that is present. In true sense, most of the cases studied so far are not truly decorticate as there occurs remnants of cortical tissue which may appear to support the necessary functions but is too little to serve the conscious behaviours observed, as confirmed by neurologists (Shewmon *et al.*, 1999). In a recent paper, it has been suggested that brainstem mechanisms or sub cortical regions which is present in individuals with hydranencephaly, may play a key role in constituting the conscious states providing adequate neural mechanism related to conscious functions and therefore should not be restricted to the thalamocortical complex. Prolonged survival is therefore more likely associated with the preserved brain stem, aggressive nursing care or a combination of both (Merker, 2007).

### 3. Behaviour and Capabilities Observed in Hydranencephaly Case Studies

Most of the children with hydranencephaly are classified by neurologists in the category of "vegetative state" based on the theoretical assumption of the cortex as a region for the functioning of consciousness (MSTF 1994, RCP 2003). "Vegetative state" is defined as an unconscious state wherein a person is not responsive to the outside world and can't consciously regulate its body (Wales and Waite, 2005). According to John Searle, consciousness is an inner, qualitative and subjective experience in other words, if you wish your hand go up, it goes up (Searle, 2007). It is an emergent property that is not specific to any structure of the brain but lies within it and beyond it. Taking away brain

structures may change the quality of consciousness but cannot disrupt it entirely. Children with hydranencephaly are not only awake and alert but also respond to their surroundings in the form of emotional and environment related events. This simple behaviour observed qualifies with the simplest definition of awareness which is also the classification criteria during any ordinary neurological examination (Krishblum *et al.*, 2011).

Pain and suffering is another criterion that is used to determine whether a person is conscious but has been controversial in persons with disorders of consciousness and is continued to be debated by the scientific, medical ethics and legal communities (Schnakers and Zasler, 2007). The controversy for such a case arises when the origin of consciousness is challenged or rather when a narrow minded approach is taken to localize consciousness to just the neural cortex. Pain is defined as an unpleasant sensory and emotional subjective experience mediated by emotions. In a survey conducted from March 2006 until end of May 2007, resulting in a total of 108 participating caregivers by the Rays of Sunshine - Hydranencephaly Information Network, it was observed that 96% of children with this disorder were reported to feel pain, this may differ based on the amount of cortical tissue present but the experience of pain conforms to the subjectivity of their consciousness (Rays of Sunshine HIN).

Children with hydranencephaly smile and laugh just like humans' children, which is animated on their faces based on their emotional states (Merker, 2006). These children go through the normal sleep/wake cycle; they know their parents and immediate family and are comforted by one person over another and can recognize voices. They can recognize their favourite toys and express while making choices and are capable of reaching for their objects of desire. In the Rays of Sunshine survey, it was confirmed that 69% are most interested in listening to things such as their mom's voice, music, bells



and stories like a normal child (Rays of Sunshine, HIN). In one of the cases, the individual when called, would raise her head, look at the person and smile. This individual liked puppies and small children and would light up whenever this was possible which was evident by the emotions expressed through facial expressions. In another individual, body awareness was demonstrated by stroking of the hand over the face when hurt (Shewmon *et al.*, 1999).

Mirror test is one of the techniques used to measure self-awareness and is used as a measure to determine whether an individual can recognize its own reflection in a mirror as an image of itself (Gallup, 1970). Alan Shewmon and his colleagues had a chance to observe an individual in his home environment, who showed a fascination to his own reflection in the mirror and despite the efforts to distract him, he kept turning back to look at his reflection and kept smiling (Shewmon *et al.*, 1999). This may have been a one off instance which may not confirm whether the individual was observing his own image, but the experience of experiencing an image clearly demonstrates the ability of the individual to be conscious of what was visualized especially with the smiling and repetitive gestures observed. The Rays of Sunshine survey also confirmed that 81% of the children were aware of their surroundings while 57% were aware of objects around them. 24% of the children showed awareness of their body while 57% showed fear or dislike. 79% showed interest in music, with 66% showing a preference of music of one type over the other (Rays of Sunshine HIN). Such intricate behaviours and observations provided by close associates may appear exaggerated but the experience of being the observer cannot be experienced by the critic.

In cases of hydranencephaly, the children are subject to seizures of episodic absence epilepsy which represents a basic condition conforming to consciousness (Karim *et al.*, 2010). This absence usually last for 5 – 20 seconds, multiple times a day,

where the individual blanks out or stares into space and upon return starts looking around and interacting. This return proves that the individual is once again aware of its surroundings and its presence, conforming consciousness (Bower, 2007). Parents of children with hydranencephaly usually refer to these episodes as “a time taken to talk to the angels” and usually recognize when their child is back. The oldest individual with a confirmed case of hydranencephaly celebrated his 33<sup>rd</sup> birthday before his passing and lived a long life due to the care and love that was parted over these wonderful years (Rays of Sunshine, HIN). Cases in hydranencephaly are definitely not normal but cannot or should not be termed as “vegetative” for they are self-aware and have the capability to experience and express, as observed in most of the cases. Self-awareness or consciousness cannot be reduced to a mere external manifestation nor can its absence be suggestive due to the absence of such manifestations especially if the performing apparatus is pathologically or developmentally inadequate.

#### **4. Consciousness lies beyond the brain and is quantum computed**

The case of hydranencephaly is a challenge to the field of neuroscientific research which currently stills lingers on the traditional neurophysiologic theory, that consciousness requires neocortical functioning. For where exactly does consciousness reside in the brain in not yet known and will never be known, as the brain though conscious is not the only organ that is conscious, for consciousness resides in each and every inch of the body, each and every cell of the body and this is what provides the ability for such individuals to survive. The life expectancy may not be as high as a normal human being but the ability to express and experience within their life span remains infrangible. In fact, their ability to experience and their willingness to understand their consciousness should be much higher than a normal human, who takes this experience for



granted. "Vegetative" should be the right word for us and for what we have become; of being unaware of our own awareness; unconscious of our very own consciousness.

Consciousness is not a complex phenomenon; it's the complexity of the human brain that has made it complex or complicated. The Hameroff-Penrose ORCH-OR theory provides a strong evidence of consciousness computed within the microtubules of the cells (Hameroff and Penrose, 2014) which can support the existence of consciousness beyond the limits of the brain and which seems to have been in existence way before the evolution of the brain (Pereira, 2014). Our multicellular bodies are made up of interactive quantum computed cellular networks, which support the underlying chemical based interactions and mechanisms that are known and those that are yet to be known. This flow of consciousness is mediated throughout the body and follows the laws of quantum wave collapse to provide the subjective experience. In the case of hydranencephaly wherein the cortex is not formed, the flow of consciousness gets altered or distorted but can easily be transformed and moulded based on the quantum computations, to provide the experience of consciousness in these individuals.

Consciousness is therefore a fundamental property while the brain is always restricted to emerging creation which helps to increase intelligence and build an identity. The impaired cognitive capabilities such as movement, reflexes, ability to walk and run, motor skills, etc. may be associated with the absence of the neural cortex and therefore is not demonstrated by these individuals, but the experience of joy, awareness, self-awareness, feelings, emotions, etc. are subjective experiences of consciousness based which are not specific to the brain and can be managed by quantum computations. Consciousness can therefore exist without a cerebral cortex, for as of now there is no place in the cerebral cortex that has been defined to be the zone or area of

subjective experience and perception. Hydranencephaly children may not demonstrate cognitive capabilities but are conscious and their subjective experiences remain priceless for those who are with them.

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