



Quantum, Brain, and Immunity Triangle in Mental Health and Neurosciences

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Abstract

Immunopsychiatry is a fledgling research field with great potential in the etiological research of psychotic disorders and can turn out to be helpful in finding novel treatment strategies and repurposing existing therapeutic agents. The clinical applications of Neuroquantology complement some of the etiological views of psychotic disorders that are evolving in immunopsychiatry. The pathogenesis of psychotic process may involve an underlying immune disturbance leading to neuro-quantological disorders. The cytokine storm that occurs due to COVID-19 and the resulting neurotoxic effects illustrate how an autoimmune reaction can potentially form psychotic symptoms through the mediation of the brain. Studying the interconnection between neurotransmission and immunity has significant relevance in the etiopathogenesis of psychiatric disorders. Immunopsychiatry alone may not be adequate to explain the development of psychotic symptoms, but Neuroquantology and immunopsychiatry complement each other in this endeavor. An expanded model of the brain–mind consciousness complex is required to understand the intricacies of psychotic symptomatology and contributions from Neuroquantology are highly enriching. The claims of the practitioners of quantum immunotherapies need further exploration. Quantum-brain and immunity triangle can result in a huge paradigmatic shift in our understanding of psychiatric disorders and the evolving landscape of immunopsychiatry and clinical Neuroquantology warrant further promotion.

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Introduction

The autoimmune etiology of schizophrenia (SCZ), or the viral precipitation of an autoimmune process causing SCZ, has been an avenue for theoretical speculations. Immunopsychiatry is a new research field dealing with immunological themes of psychotic disorders and biological depression (Khandaker et al, 2017). It is an extension of psychoneuroimmunology. The former implies the control of immune system over psyche and psychiatric disorders, and the latter refers to the psychological control of the immune system (Pariante, 2015). Immunopsychiatry introduces a biomedical paradigm of the immune system as predominantly autonomous with a bi-directional interaction between psyche and immune system.

The recent use of this term may appear as a hierarchical turn suggesting that the brain no longer governs the immune system, but that behavior and emotions are governed by peripheral immune mechanisms (Pariante, 2015). If analyzed closely, immunopsychiatry and clinical Neuroquantology are a continuum and immune disorders alone cannot explain the psychotic symptomatology. Immune system has overseen brain development in the early stages of vertebrate and nonvertebrate evolution. It has more tenancy rights in the body, and evolutionary progress would not have occurred without a robust immune defender system. Creatures like bowhead whales with advanced immune system capable of alleged self-repairing abilities may live up to centuries.

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The immune system is like the military establishment of a nation, taking entire control of the administration in certain circumstances. Sometimes, the control can even be in the form of a coup, and metaphorically, autoimmune reactions are comparable to a military coup. Although the underlying cause of a psychosis may be at the immunity level, the formation of SCZ symptoms may be due to disorders of the mechanical part of consciousness—there may be consciousness upon consciousness. SCZ is a multilevel disorder. The neuroendocrine and immune systems also interact through different neural and hormonal pathways.

Autoimmunity in Psychiatry

The dopamine hyperactivity hypothesis of SCZ has a weakness in the sense that there is no mere increase of dopamine in the neuronal system despite the dopamine overactivity. The dopamine overactivity in the absence of dopamine excess warrants some other biomechanism responsible for this biological activity. In the early 1980s psychotic-like behavioural changes were demonstrated in experimental rats receiving intracysternal injections of autoantibodies to the cerebral antigens (Iurkevich & Poletaev 1982). Such a finding stimulated the autoimmune views of SCZ and J. Knight and H.H. Fudenberg proposed an autoimmune hypothesis of SCZ independently. They argued that autoantibodies may infiltrate the brain or be formed intrathecally in the intracerebral immune system area. The autoantibodies may upset neuronal networks functioning and alter synaptic transmission in the limbic system or in the septal region of the brain and such a disruption might result in psychiatric disorders (Adams et al. 2012, Fudenberg et al. 1983, Knight 1982).

The autoimmune hypothesis does not question the proposal of hyperactivity of the dopaminergic system in various regions of the brain that contribute to the pathogenesis of SCZ. It has been suggested that there may exist stimulating or agonistic autoantibodies towards dopamine receptor (Kinight 1982). Such an assumption is analogous to the pathogenesis of Graves' disease, with its stimulating anti-TSH receptor immunoglobulins (Adams et al 2010; 2012). Antireceptor psychopathogenic autoantibodies could be triggered by the cross-reactivity or via anti-idiotypic mechanisms and this may happen during the immune system response to viruses or other pathogens capable of binding neuronal

receptor structures (Pert et al. 1988). This hypothesis tied with the epidemiological data on the observed relationship between the surge in the incidence of psychoses after the outbreaks of neurotropic viral infections reported at the earlier part of the 20th century (Menninger 1994).

The literature on autoimmune aetiology of psychosis is growing fast (Mayorova et al, 2021; Davison, 2012; Gaughran et al, 2018; Pandarakalam, 2013, 2015; Rege & Hodkinson, 2013). There has been considerable excitement about the prospect that some cases of psychosis may be wholly due to brain-reactive antibodies. This is due to the reporting of antibodies to N-methyl-D-aspartate receptor and the voltage-gated potassium channel-complex in a few patients with first-episode psychosis (Gaughran et al, 2018).

Immunopsychiatry search for the precise processes by which specific neuroimmune effects are completed. Cytokine storm, the autoimmune reaction occurring at the height of COVID-19 infection in some individuals, is responsible for the COVID-19 complications and the viral precipitation of an autoimmune disorder is a well-recognized phenomenon. Even in obsessive-compulsive disorders, autoimmune etiology has been suggested 132 (Maina et al, 2009; Gerentes et al 2019; Pearlman et al, 2014). Anti-brain antibodies reacting with basal ganglia tissue has been hypothesized in a subset of OCD patients. For adherents to the autoimmune etiology of SCZ, bipolar disorder (BD) and other psychotic disorders, the neurotoxic effects of COVID-19 are an eye-opener on the impact of an autoimmune reaction on the nervous system (Butler et al, 2020; Pandarakalam, 2020). These views explain only the etiology of psychotic disorders and not the dynamics of the symptomatology. Without the inclusion of neuroquantoloical principles in this study, these renderings would remain unfinished.

Quantum Consciousness

Unconscious is now increasingly affiliated with quantum principles. In such a scenario, there is a need to revisit Freud's concept of the unconscious which he meant only unconscious cerebration. The laws of classical physics are applicable only to our material world, but there is also an unseen world governed by its own differing unique physics. To some extent, Einstein's theory of relativity, the theory of quantum mechanics and the work of physicist David Bohm are highly pertinent to these invisible dimensions; they help us to probe into the deeper truths of universe. As a byproduct of such



exploratory attempts, we may also gain new insights into the nature of consciousness. Without an adequate knowledge of the mind-consciousness complex, mental health workers would become like prescientific surgeons who lacked the knowledge of anatomy.

The material universe has quantum underpinnings, and our minds are microcosms of the universe. Particle physics has brought to the scientist the concept of a hypothetical quantum mechanical body. Quantum physics is relevant to cognitive sciences, and an expanded model of the brain-mind-consciousness complex is significant in studying consciousness and its disorders. Bioenergy fields complete the triangle of quantum-brain-immunity. Quantum physics can only explain the mechanical quantum part of our consciousness and risks oversimplification.

Higher energy bodies are akin to minds, and causal bodies to the spiritual body intrinsic to the faith traditions. Humans may have quantum bioenergy fields, quantum consciousness and quantum-like consciousness (Spiritual force) and there is a reach between all the energy fields. According to particle physics, consciousness is the ground of matter and mind. Wisdom of metaphysics are as precious as quantum physics. According to metaphysical traditions, humans may carry a total of seven bodies or vehicles, one physical and six psychospiritual with their own characteristics and attributes, physical body being the densest and others subtle (Shrikande, 2009). They could be named as 1. Physical (Annamaya Kosh-Sanskrit Term), 2. Eheric (Pranamaya Kosh), 3. Astral (Vignamaya Kosh), 4. Mental (Manomaya Kosh), 5. Spiritual (Anndamaya Kosh), 6. Cosmic (Vishwamaya Kosh), 7. Nirvanic (Nirvanamaya Kosh).

Max Planck has declared: "There is no matter as such". Such an utterance is equivalent to asserting that there is no matter without quantum. Of course, quantum is the rock layer of matter, but mysticism may be the keystone of overall reality. The observer and the observed physical event become inseparable making the material world non-existent without consciousness. In my contention, if the existence of a Master Observer is brought into the equation, macroscopic objects could exist without human observation. Particle physicists have asserted the primacy of consciousness. Quantum mechanical effects like entanglement and non-locality breaks down the gulf between mind and matter. If matter itself is ultimately a product of consciousness, material brain should also be capable

of generating at least low-level mechanical consciousness. So, a limited form of epiphenomenon should not be ruled out and quantum bioenergy fields may be a player in this.

From a cybernetic perspective, the brain – with its 100 billion neurons, axonal firings and synaptic connections acting as information networks of 'bit' states and switches – may be regarded as a biological computer. Variability in synaptic strength mediated by chemical neurotransmitters shapes its network activity and enables learning and intelligent functions (Koch, 2004). The brain can perform non-conscious functions that merit its being termed a biological computer; they may include perception and control of behaviours termed 'zombie modes', 'autopilot' or 'easy problems' (Koch and Crick, 2001). At this juncture, it is hard to distinguish quantum bioenergy fields that envelope the material body from the quantum part responsible for quantum consciousness. By seeking the help of quantum physics, we are only trying to solve one mystery with another. The quantum features of consciousness have been described elsewhere (Pandarakalam, 2019).

Clinical Neuroquantology

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Mainstream medicine has yet to accept the existence of quantum bioenergy fields and they are not even prepared to consider their presence along with the material body; they are still in the honeymoon phase with the Newtonian proclamation that nothing invisible exists. Complementary medicine not only recognize their existence, but also take full advantage of such concepts in their clinical domain. Even consciousness has disappeared from the map of cognitive sciences. The prevailing biological approach in psychiatry has reduced psychopathologies to neurons, neural nets, synaptic pathologies, and neurotransmitters. Sultan Tarlaci has opined that at a deeper level, the basis of psychopathologies can also have a quantum psychopathological approach, and psychopathologies could be viewed with the somewhat speculative quantum physical approach (Tarlaci, 2019).

In quantum physics, a quantum mechanical body co-existing with the brain has currently gained more attention. A comprehensive elucidation of psychotic symptoms cannot be obtained only by immunopsychiatry. The intricacies of psychotic symptomatology can be well understood using an expanded model of the brain-mind consciousness complex. Most psychotic symptoms are



neuroquantological disorders of consciousness (Pandarakalam, 2019). It is not a feasible option to use neurology alone to explain consciousness. The interactions between neurology and quantum is still hard to explain. SCZ symptoms will remain incomprehensible and bewildering without some knowledge of quantum consciousness.

It is now increasingly recognised that brain can be affected by various autoimmune process leading to psychotic symptomatology. Like SCZ, neuroinflammation and peripheral immune dysregulation may play a role in the pathophysiology of BD. The link between immune dysregulation, autoimmunity, and BD may be closer than previously thought (Rege and Hodgkinson, 2013). Similar to SCZ, neuroquantological factors shape the symptoms of BD. The mechanisms of the innate and adaptive immune systems in the pathophysiology of BD have to be further explored along with the neuroquantological features.

In the Penrose–Hameroff “Orch OR” theory, consciousness could be the fifth force of the universe, brain being the neural beginning of consciousness. To unriddle the puzzle of consciousness, it has been proposed that quantum consciousness is generated by microtubules which form a filamentous nanolevel web of protein strands that spread throughout the brain tissue (Hameroff,2007). This posits that quantum vibrations in the microtubules produce consciousness. The Penrose–Hameroff “Orch OR” theory suggests that consciousness originates from deep-level and fine-scale activities as well as microtubule quantum vibrations inside the brain neurons (Penrose & Hameroff, 2015).

It has been hypothesized that the impairment of microtubules due to autoantibodies produced from a brain-related autoimmune reaction, is the causative factor of psychotic symptoms. The autoantibody production is synonymous to the generation of a tsunami from an earthquake under the seabed due to tectonic shifts. Consciousness and brain studies are bridged by the Orch OR theory and takes us to immuno-neuropsychiatry. We probably need input from the field of neuroquantology to solve the riddles of SCZ and BD symptoms. This is because SCZ and BD may be immuno-neuroquantological disorders if some of the symptoms are considered as consciousness disorders. In the clinical setting, the Orch OR theory has explanatory value.

Quantum Immuno-therapeutics

The bedrock of modern medicine is biochemical molecules, but adaptive pathogens can evade such molecules resulting in drug resistance. So, non-traditional treatment approaches have become inevitable. Gerontologists are debating about the role of immunology in aging. It is not clear whether aging itself is due to weakening of immunity or immunity declines due to ageing process. The loss of immune function may manifest in various ways such as a chronic illness, allergy, and other medical problems.

Quantum immune oncology is evolving in the hidden quarters of cancer research. Immunotherapy is rated currently as an important replacement to treat cancer and has a major place in quantum immune oncology. Defective functioning of immunity is thought to express even as cancer due to a failure of the immune system to identify malignant cells and stop their proliferation and subsequent metastasis. Quantum Immunotherapy is highly sought after in cancer therapy and prevention. The basic objective of the Quantum Immunotherapy program is to re-establish optimal balance and function to the immune system so that malignant cells will be identified and eradicated. Among the 134 drugs that have been evaluated, those blocking the protein PD-1 and its ligands have been regarded an efficient way to activate the T-cells (Albuquerque et al, 2017).

Redox perturbations involve using quantum dot therapeutics. Lately quantum dot therapeutics have shown tremendous promise by specifically generating superoxide intracellularly using light as a trigger to selectively eliminate a wide range of multidrug resistance pathogens. (Levy, Chowdhury and Nagpal, 2017). Nano-Immunotherapeutic involves a class of new immunomodulatory materials. They use their physicochemical properties including size, shape, surface charge, molecular weight, roughness, and hydrophobicity to mimic normal cellular components for immune-evasive or immune-suppressing purposes, or as immune-activating materials (Lewis & Roy, 2014). Quantum dots are only a few nano-meters in size and can cross blood brain barrier. These dots made from graphene are found to bind to Alpha-synuclein, a major constituent of Lewy bodies accounting for Parkinsonian disease and mice experiments with graphene dots have demonstrated promising results. Also, such dots are found to bind to amyloid and reduce its clumping together that occurs in Alzheimer’s disease.



It is an unquestionable claim that lithium used in the treatment of BD function more efficiently over other mood stabilizers. This superior property may be because of its probable quantum effect on brain. Lithium drugs have different effects on the behaviour of rats, depending on what form or “isotope” of lithium is experimented with (Brooks, 2015). In chemical terms, different isotopes should behave almost identical. Theoretically, if the lithium operated like a conventional drug, the isotopes should all have the same effect. But the nuclei of the atoms of different lithium isotopes can have different spins and this is really a quantum property that might affect the way lithium drugs operate on the brain. In other words, lithium exerts its therapeutic effect through a quantum mechanical effect on the brain. These renderings may be only thought pieces and have yet to gain the status of a hypothesis. The exact mechanism of action of lithium is unclear in psychopharmacology. It has been postulated that lithium acts in a number of molecules and neurotransmitters that are implicated in neurotransmission and intracellular apoptotic as well as neuroprotective pathways. There is enough room for the inclusion of quantum views in the search for the mechanism of action of lithium that may also shed some light into the etiopathogenesis of BD which encompasses high energy and low energy states.

Immuno-neuropathology

Brain abnormalities in SCZ are not well established. Accepting the autoimmune etiology of SCZ, we may hypothesize that autoantibodies may tamper with the brain structures and contribute to SCZ symptoms. After a century of research, the neuropathology of SCZ remains vague, and the expression “SCZ is the graveyard of neuropathologists” still haunts this challenging research field (Hao et al, 2020). The pathological changes in SCZ are very subtle and hard to demonstrate. Morphological or functional abnormalities in the brains of patients with SCZ have been reported by CT or MRI and with advanced functional brain image technology such as positron emission tomography or single-photon emission computed tomography. These studies reveal that SCZ is not a pure functional disease without organic factors and is a multifactorial condition. Some reports indicated that neuropathological abnormalities in the post-mortem SCZ brain were found in almost all areas of the brain, but there were more reports describing the temporal and frontal

lobes compared to those describing other areas of the brain (Iritani, 2007). Evidence for deficits in the temporal lobe of the SCZ brain includes 1) enlargement of lateral ventricles; 2) reduced volumes of the hippocampus, hippocampal gyrus, and amygdala; 3) reduction in the numbers or sizes or an abnormal cellular architecture in those areas; and 4) reduction in temporal cortical interneurons. There is also considerable evidence on the deficits of gabanergic interneurons in the frontal cortex. In recent molecular biology studies, several putative candidate genes were related, some of which may have the task of neurodevelopment and neuronal network formation.

Who the orchestrator of these neuropathological changes remains unanswered? The mediation of autoantibodies along with other factors is worth considering while pursuing the etiology of SCZ from various angles. An imbalance in the activity of dopamine neurons in different parts of the brain has been shown to underlie many of the symptoms associated with SCZ. Dopamine receptors may exist outside the brain and occupy the surface of immune and synovial cells. Immune T-cells, B-cells, monocytes, and natural killer cells all express dopamine receptors and are involved in the illness 135 process of SCZ. There are also suggestions that the microtubules destabilized by the autoantibodies are involved in the consciousness-linked symptom development of SCZ. The recognized neuropathology may be an effect rather than causative. The symptoms of SCZ are comparable to a tsunami; the cause of the tsunami is not in the seawater but in the seabed, where the shifting of the tectonic plates stands for the autoimmune process. As previously mentioned, SCZ symptoms also involve disorders of consciousness (the tsunami). Thus, a better grasp of consciousness is warranted to develop a fuller understanding of these symptoms (Pandarakalam, 2019).

The neurological effects of SARS=Cov-2 may offer fresh insight into the immunological role involved in neuropsychiatric disorders. SARS-CoV-2 is associated with several neurological symptoms and syndromes, including headache, fatigue, anosmia, ageusia, anorexia, myalgias, asthenia, meningitis, encephalitis, Guillain-Barré syndrome, altered consciousness, syncope, and stroke (Koralnik & Tyler, 2020; Román et al, 2020; Wu et al, 2020; Anna et al, 2020). Neurological effects of coronaviruses (including SARS-CoV-2) may be triggered by direct cytopathic effects of the virus, secondary effects of severe pulmonary infection, a



cytokine storm, or a combination of these (Lechien, 2020). SARS-CoV-2 may cause neurological disorders by directly infecting the brain or because of the strong activation of the immune system. Two-thirds of patients were observed to suffer initially from olfactory and gustatory symptoms, and the fatigue experienced by most patients is suggestive of neurotoxicity (Singer et al 2016). SARS is clinically neurotoxic, causing mental health and neurological disorders including neuromuscular and joint findings (Stainsby et al, 2011). COVID-19 has also been linked with encephalitis (Garg et al, 2020) and Guillain-Barré syndrome (Scheidl et al, 2020; Fokke et al, 2013; Zhao et al, 2020), where the immune system attacks the nerves—an overreaction of the immune cells to thwart the viral pathogen. This is akin to a cytokine storm. It is unclear if the encephalitis encountered in COVID-19 is due to a direct invasion of the virus into the nervous system or if the destruction is due to the overactivity of the immune system. Again, the mechanisms of Guillain-Barré appear to be associated with the normally protective antibodies of the immune system, which are believed to go “haywire” occasionally by attacking the nerves and their coating. Hearing loss has been reported in several cases of recovered COVID-19 patients. Even in asymptomatic cases, COVID-19 infection can have deleterious effects on cochlear hair cell functions (Mustafa, 2020). The viral precipitation of autoimmune disorders is a well-recognized phenomenon. Thus, the neurotoxic effects of COVID-19 may take us into a new arena of immunopsychiatry.

Immunity-based Psychiatry

From an evolutionary angle, the immune system was the first to evolve and move forward. It supervised all other physiological systems, including the nervous system. This is so because of its defensive supremacy. The brain took over control at a later stage in the evolutionary pilgrimage. However, there are instances when the immune system overrides the control of the brain. Cytokine storm identified in COVID-19 is such an example resulting in damaging effects on the nervous system. Studies of neurotoxic effects in COVID-19 due to the cytokine storm, which is an autoimmune reaction, offer a model of SCZ symptoms owing to the outcome of an autoimmune reaction of unknown etiology. Disruptions in the immuno-inflammatory system have been indicated in the etiology, pathophysiology, phenomenology, and comorbidity

of several psychiatric disorders, including SCZ, bipolar disorder, major mood disorders, and autism (Berk et al, 2013; Khandaker et al, 2015). It has been postulated that proinflammatory cytokines and circulating autoantibodies can influence the brain causing alterations in mood, cognition, and behaviour and at the same time, these chemicals have been ascribed to the aetiology of SCZ, other psychotic disorders, and depression (Dantzer et al, 2008; Raison et al, 2006). From an immunological perspective, inflammation implies to chronic, low-grade systemic inflammation as characterized by increased concentrations of circulating inflammatory markers including cytokines and acute phase proteins in peripheral blood and not referring in the pathological sense of the term indicated by the cardinal signs of rubor, calor, tumor, dolor, and functio laesa.

The proposal that a subset of SCZ may emerge due to autoimmune antibody production against the brain warrants further validation. Research studies have hinted at a potential inverse relationship in the prevalence and risk for developing schizophrenia and rheumatoid arthritis, which is an autoimmune disorder (Tulsi et al, 2017). Individuals who suffer from more than one autoimmune disorder have a 136 higher propensity for developing schizophrenia. Such conjectures strengthen the foundation of immune psychiatry. The inverse relationship between SCZ and rheumatoid arthritis is puzzling but may point towards other yet unknown potential medical conditions that may have such inverse relationship with SCZ. Such a proposal has great exploratory value in the etiopathogenesis and novel treatments of SCZ. Autoantibodies were hypothesized to destabilize microtubules, resulting in disorders of consciousness (Pandarakalam, 2019). Autoimmune disorders can have no infectious origin or have infectious precipitation. An infection may also just spiral an existing autoimmune reaction. There are several hypotheses for a virally triggered autoimmune mechanism. COVID-19's subtlety in asymptomatic cases rekindles interest in the infectious etiology of a subset of psychotic symptoms. Immunopsychiatrists claim that a better understanding of the immune system's role could be a paradigm shift in psychiatry, warranting great collaboration between different scientific communities (Khandaker et al, 2017). Leboyer et al. suggest deconstructing current clinical practices to segment psychiatric disorders and propose a research agenda for reconstruction based on the



integration of a reconciled body–brain interface leading to a new “immuno-psychiatry-based nosology” (Leboyer, 2016). Generally, a subset of SCZ and bipolar disorders have upward causation, whereas depression has downward causation with biological correlates. However, patients with physical illnesses, such as rheumatoid arthritis and hypothyroidism, present with depression and may have upward causation. Depressive feelings at the onset of an influenza infection are well recognized and attributed to the antibody production of host cells. Depression has different meanings to different people and is essentially considered a psycho-bio, social condition. There is no absolute cause for depression. Some psychotic conditions or SCZ-like states may have downward causations with biological correlates.

Clinical, post-mortem, animal, in vitro, and cell culture studies revealed that coronaviruses are potentially neurotropic and can induce neuronal injuries. Aside from potential brain infiltration, “cytokine storms” involved in the immune response to coronaviruses may trigger psychiatric symptoms by precipitating neuroinflammation. The interaction between innate and adaptive immune systems and neurotransmitters may manipulate a mechanism triggering mood disorders, psychosis, and anxiety disorders. Understanding the psychological impact on psychiatric patients during the COVID-19 pandemic may provide insights on how to develop a new immunopsychiatry service, and further research is required to compare pro-inflammatory cytokines between psychiatric patients and healthy controls during the pandemic (Hao et al, 2020). Coronaviruses can induce psychopathological sequelae through direct viral infection of the central nervous system or indirectly via an immune response (Wu et al, 2020).

COVID-19 needs to be explored further because of the possibility that it causes immune-mediated neurotoxic effects on the brain, just like SARS. Neurotoxic effects and psychotic symptoms may not be identical phenomena; while both are brain mediated and can stem from immunity aberrations; psychotic symptoms involve disorders of consciousness. Thus, COVID-19 pandemic has been an eye-opener to the diverse aftermaths of a viral assault, particularly an abnormal immune reaction leading to psychiatric symptoms and other fatalities. The study on the neurotoxic effects of COVID-19 following a cytokine storm may comprise a new research field, namely, immuno-neuropsychiatry, which is an expanded concept of immunopsychiatry.

Neuropsychiatric conditions encountered in multiple sclerosis, an autoimmune disorder, include affective and behavior disorders as well as psychotic and anxiety disorders along with neurological symptoms. These are good examples for the validity of immuno-neuropsychiatry. The proposed hypothesis is that an immune-based neurological mechanism can generate psychotic symptoms just like the COVID-19 neurology cases. Such symptoms could manifest either through the mediation of the brain or even through a hitherto unknown mechanism.

Conclusion

Psychiatric research has been a quicksand in the sense when one aspect of psychotic process is illuminated, other aspects of the disorder become submerged under uncertainties. The reality may be that psychotic process involve immune-neuroquantological domains and coordinating these different aspects is a great challenge. The emerging fields of immunopsychiatry and Neuroquantology have the capability to broaden the exploration of a mechanism-based nosology, and such an endeavour might bring us to the discovery of more effective personalised 137 treatment strategies. It may come across as “thinking outside the box.”

The given evidence in immune-neuropsychiatry has the potential to explain the neurotoxic effects of COVID-19 and can be tested in developing treatment strategies. Immunopsychiatry shows promise in various directions, particularly in the aetiological research of psychotic disorders, and more investment should be made in this developing area. The discovery of a derivative of clozapine without the major side effects could be a game changer in SCZ treatment. Immunopsychiatry prompts us to develop an expanded model of brain-mind-consciousness complex; psychotic symptoms involve disorders of consciousness. Disruptions in the immuno-inflammatory system have been associated in the aetiology, pathophysiology, phenomenology, and comorbidity of several psychiatric disorders such as SCZ, bipolar disorder, major mood disorders, OCD, suicidal behaviour, PTSD, and autism.

Immunopsychiatry and psychoneuroimmunology are meaningful and valuable terms. Immuno-neuropsychiatry is an addition to these fledgling scientific fields. The term immunopsychiatry may indicate a hierarchical turn suggesting that the brain no longer governs the immune system, and that



behaviour and emotions are governed by peripheral immune mechanisms. It could be misconstrued as a philosophical tilt paving the path to mindless psychiatry and ultra-reductionism. According to this immunologically based concept, patients with SCZ suffer only a chronic medical condition and their individuality and higher consciousness are undamaged. There may be consciousness upon consciousness. Immunopsychiatry is founded in biological psychiatry and gives impetus to the search for the non-biological aspects of the brain-mind consciousness complex and their disorders.

Studies of the neurotoxic effects of COVID-19 due to an autoimmune reaction may lead to the arena of immune-neuropsychiatry and immunopsychiatry. Likewise, a subtle autoimmune reaction could theoretically be responsible for the pathogenesis of psychotic symptoms that may have neurological mediation. Metaphorically, immunopsychiatry can explain the “tectonic shift” while Neuroquantology could elucidate the “tsunami” involved in psychotic disorders. Without bringing quantum views of the mind, we will not be able to expand our psychopathological models of psychotic disorders and that is the meeting point of Neuroquantology and immunology. If analysed carefully, we find that Neuroquantology and immunopsychiatry complement each other in our understanding of psychotic disorders. There is a triangular relationship between quantum, brain, and immunity. Brain and immunity together form the base of the triangle, and quantum forms the apex. If the base is stable, the apex will be able to maintain stability. Psychotic symptoms involve disorders of quantum mechanical consciousness existing at the lower step in the ladder of different levels of consciousness.

Decades of brain centred research has not been fruitful in gathering information about psychotic process that would lead to effective treatment strategies. Research in hard psychiatry has been at a standstill for many decades and the autoimmune views may give a fresh impetus to novel form of therapies. Even acute psychotic symptoms have a subtle pre-psychotic phase and unless treatments are aimed at this preceding phase, newer therapies are not going to achieve the targets. Diabetes mellitus became a manageable medical condition when insulin was identified as the causative factor. By identifying the immunological factors, we are in a similar position with regard to the treatment of psychotic disorders.

Immunopsychiatry runs the risk of growing as an unruly branch of psychiatry and may develop as a brainless, mindless psychiatry. The only way forward for adherents of immunopsychiatry is to embrace tenets from Neuroquantology. Identifying the link between immunity and Neuroquantology would lead to conceptual clarification, but immunopsychiatry alone could only lead to conceptual confusion. Once such a connection is established, more explorative research would take place and the true picture of psychotic process with the intricate dynamics of the symptomatology of psychosis could be uncovered. The hidden “immune military route” that penetrates the brain and beyond or solving the jigsaw puzzle of the quantum, brain and immunity triangle would instigate a paradigmatic shift in cognitive sciences. A development of that scale may lead to the discovery of many novel immunity-based treatment strategies.

Conflicts of Interests

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