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Artificial Intelligence and Neuro-Medicine: Emerging Trends in Bipolar Disorder, Glioblastoma and Alzheimer's Disease

Pandey S*

Head, Department of Clinical Research, Indira IVF Hospital, India (Formerly)

***Corresponding author:** Dr. Saumya Pandey, Ph.D. (Life Science) Head, Department of Clinical Research, Indira IVF Hospital, Udaipur-Lucknow, India (Formerly), Tel: 9473720367; Email: drsaumyapandey11@gmail.com

Editorial

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Abbreviations: AI: Artificial Intelligence; MSD: O-Methylserine Dodecylamide.

Editorial

Dissecting the intricate "neuro-immune cross-talks" in the complex etiopathogenesis of neurological disorders primarily bipolar disorder, glioblastoma and Alzheimer's disease in genetically disparate susceptible cohorts of heterogeneous population-pools by amalgamating precision-based therapeutic targeting of Ceramide-Wnt/Frizzled-Toll like receptors-autophagy biochemical/metabolic signaling cascades with Artificial Intelligence (AI) offers fascinating healthcare management avenues in eventual pragmatic, evidence-based predictive biomarker development in the Covid-vaccination era [1-4]. Moreover, CRISPR-Cas genetic engineering technology has emerged as an enigmatic modulator of complex human genetic diseases including neurological diseases utilizing genome editing and detecting specific DNA/RNA sequences to gene expression control warranting future dynamic collaborations for immuno-inflammatory disease(s)-management in neuro-medicine in the global Covid-19/Omicron pandemic and Covid-19 vaccination era [5]. In my expert opinion, the disproportionate share of psychosocial distress and neuro-behavioral deficits warrants a robust, evidence-based, pragmatic "AI-bioengineering immunotherapeutic model" for design of pharmacological scaffolds, novel drugs and clinically validated predictive biomarkers for effective management of bipolar disorder, Alzheimer's disease and glioblastoma amongst genetically susceptible at-risk cohorts of asymptomatic vs borderline vs symptomatic subsets.

During my recent meaningful collaborative discussions with senior neurosurgeons of Virginia, USA and Lucknow/New Delhi, India, I gained critical insights in the AI algorithms and sophisticated, non-invasive gamma-knife neuro-radio-surgery for precision-based neuro-radiodiagnostic assessment of the hypoxic, vascular insufficient and inflammatory tumor microenvironment/heterogeneous tissue core in the malignant brain tumor tissue of glioblastoma patients of American and Asian-Indian genetic profiles/ethnicities for evidence-based outcomes for high-quality treatment and patient-satisfaction.

Abnormal endocytosis in post-mitotic neurons may be attributed to alterations in the sphingomyelin -ceramide metabolism, resulting in the intracellular accumulation of ceramide; O-methylserine dodecylamide (MSD), a lysosomotropic agent, disrupts neuronal lysosomal proton gradient, leading to intra-neuronal ceramide accumulation, and perturbations in the intracellular transport of cholesterol and sphingolipids have been proposed to play a significant role in Alzheimer's disease [6]. Intriguingly, the emergence of AI in neuro-medicine clinical research undoubtedly offers immense opportunities to demystify the intricacies involved in neurodegeneration and interrelated neuropathologies. Healthcare systems globally are encouraging AI to achieve the ''quadruple objective'': improving patient experience (increasing productivity and efficacy in care delivery); improving population health; transcribing prescriptions, treating patients remotely, and reducing per person healthcare expenses [7-10]; and increasing the working conditions of healthcare professionals.

AI algorithms are extensively used in healthcare, including diagnostics, development of treatment protocols, medication research, customized treatment regimens, clinical risk assessment, healthcare data security, image analysis, digital nursing assistants, AI-assisted robotic surgery, and health monitoring. Overall, the future holds tremendous promise for designing a well-defined pragmatic and ethical "AI-Ceramide-TLR-Autophagy-Wnt/CRISPR-Cas Neuro-Immune Genetic Blue-Print" healthcare roadmap for diminishing the overwhelming public health challenge of bipolar disorder, glioblastoma and Alzheimer's Disease amongst population-pools of genetically mixed ethnicities worldwide.

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