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Opinion

Toll Like Receptors-Autophagy-Wnt/Crispr-Cas Neuro-Immuno-Inflammatory Biochemical Cross-Talks and Artificial Intelligence in Embryonic Induction and Fertility Management: Translational Health-Biomedical-Life Science Research Snapshot in American and Indian Genetic Landscapes

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Introduction

Toll-like receptors, a family of evolutionarily conserved pathogen recognition receptors, initiate inflammatory responses to foreign pathogens; thirteen TLRs are known till date (TLR 1-13) and their complex signaling mechanisms involve various intermediaries in the signal transduction pathway for an inflammatory/immune response in the target cell [1]. In my expert opinion, "Toll like Receptors-Autophagy-Wnt/CRISPR-Cas-Neuropsycho-Immuno-Inflammatory Biochemical Cross-Talks" triggered "Artificial Intelligence" in embryonic induction and fertility management is an intriguing translational health-biomedical-life science research area with immense neuropsycho-immunotherapeutically relevant clinical/public health impact in deciphering the intricacies of aberrant neurophysiological-psychosexual conditions associated with inflammatory microbiota at the complex maternal-fetal interface in embryonic induction/development in human Chorionic Gonadotropin (hCG)-triggered ovulation in *Mycobacterium tuberculi* susceptible infertile women of American and Asian-Indian genetic landscapes. CRISPR-Cas genetic bio-engineering technology has emerged as an enigmatic modulator of complex inflammatory diseases including neuropsychological diseases utilizing genome editing and detecting specific DNA/RNA sequences to gene expression control warranting timeline-driven scientific collaborations for immuno-inflammatory disease(s)-management in psychosexual medicine in the global Covid-19/Omicron pandemic and Covid-19 vaccination era [2-3].

"Infertility" is defined as the inability to conceive following 12 months of regular unprotected sexual intercourse; psychosexual counseling-based mental health fertility management intervention(s), marital-relationship counseling/therapy, timely referrals for psychological neuropsychiatric assessments, psychiatric treatments for cognitive impairment, obsessive compulsive disorder, bipolar disorder, schizophrenia, and/or clinical depression are beneficial in overall psychological well-being of patients symptomatic of psychosexual disorders [4-5].

TLR-Autophagy-Wnt biochemical signaling intersections coupled with AI offer fascinating life science research avenues in the mental health management of asymptomatic, borderline and symptomatic clinically infertile women with *M. tb.* positivity and their azoospermic, oligospermic and/or asthenospermic male partners of American and Asian-Indian genetic profiles [6-7]. Tobacco usage, either smoking (active/passive) or chewing, is a significant predictor of metabolic perturbations/aberrant physiologic milieu in asymptomatic and symptomatic women and men of reproductive age presenting with infertility. Furthermore, psychological/mental health and financial distress associated with the exorbitant cost of infertility treatment procedures, namely *in-vitro fertilization* (IVF), intracytoplasmic sperm injection (ICSI), etc., should be addressed by organizing quarterly, monthly and/or annual public health awareness campaigns, anti-tobacco signature drives/campaigns, tobacco cessation and infertility awareness lectures/talks, free/complementary 1-1 consultations, medical check-ups, psychosexual counseling sessions, quality time investment with clinically infertile patients, timely follow-ups of patients undergoing Assisted Reproductive Technology procedures, IVF/ICSI, etc. evaluating overall IVF success trends. Moreover, elegant amalgamation of AI algorithms with total number of embryo transfers (ETs, fresh or frozen), oocytes retrieved, oocyte quality, semen quality, sperm counts/morphology/motility, endometrial thickness, anti-Mullerian hormone levels, implantation rates, beta-human chorionic gonadotropin positivity/biochemical pregnancy, and live birth-rates in infertile women undergoing IVF/ICSI would lead to critical insights in evidence-based pragmatic outcomes with enhanced fertility success quotients in

genetically disparate population-pools of infertile women of child-bearing age.

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