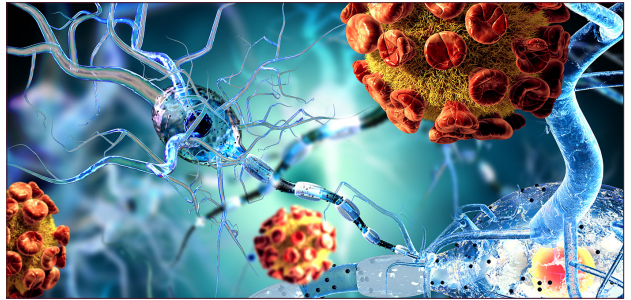

Day 1 Poster

Neuroscience 2022



7th International Conference on
Neuroscience and Neurological Disorders

March 18-19, 2022 | Webinar

The Multi-Circuit Neuronal Hyper-Excitability Hypothesis of Psychiatric Disorders

Michael Binder

Highland Park Hospital, USA

Short of a clear understanding of how psychiatric symptoms are produced, the various cognitive, emotional, and behavioral patterns that characterize psychiatric disorders continue to be grouped into syndromes and treated accordingly. However, an emerging hypothesis contends that psychiatric symptoms are driven by pathological hyperactivity in symptom-related circuits in the brain. According to the Multi-Circuit Neuronal Hyperexcitability (MCNH) Hypothesis of Psychiatric Disorders, persistent firing in anxiety circuits causes persistent feelings of anxiety; persistent firing in depressive circuits causes persistent feelings of depression; persistent firing in cognitive circuits causes ruminative and obsessive thoughts; etc... This pathological circuit-specific hyperactivity is believed to be the consequence of a genetically-transmitted failure of the neurological system to self-regulate when perturbed by a psychological, emotional, or biological stressor. The failure of neurons to shut off is also believed to drive a chronic hyper-activation of the autonomic nervous system, the hypothalamic-pituitary system, the immunologic system, the metabolic system, and various other systems of the body, thus explaining the link between upper-end-of-normal resting vital signs and the development of any of a wide range of chronic diseases, such as anxiety disorders, mood disorders, diabetes, high blood pressure, heart disease, autoimmune diseases, and cancer. This presentation will

discuss the enormous implications that this has for the treatment and prevention of nearly all illnesses, both psychiatric and medical. It will also discuss the source of the abnormality and a simple, objective means by which persons at risk can be identified. In an era of smartphones, wearable devices, and a growing public desire to prevent rather than react to illness, the ability to use resting vital signs to identify the fundamental driver of both mental and physical illness could usher in history's greatest campaign in the fight against sickness and disease.

Speaker Biography

Michael Binder is a board-certified adult and adolescent psychiatrist with nearly 30 years of experience treating a wide range of psychiatric disorders. He is also a neuroscience researcher with a focus on identifying the mechanisms by which psychiatric symptoms develop and the means by which psychotherapy and pharmacotherapy combine to help alleviate symptoms. In 2019 he published the Multi-Circuit Neuronal Hyperexcitability (MCNH) Hypothesis of Psychiatric Disorders, the first hypothesis to explain, both neuropsychiatrically and psychophysiologically, the means by which psychiatric symptoms develop and, based on the anatomy and physiology of the cognitive-emotional system, the most rapid and effective ways to relieve them. Somewhat by serendipity, the MCNH hypothesis also led to the discovery that an inherent hyperexcitability of the neurological system is the fundamental driver of virtually every mental and physical illness that can be triggered or exacerbated by stress.

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Notes:

Diagnostic performance of Machine Learning based MR algorithm vs Conventional Images for predicting the likelihood of Brain Tumors

Rama Alkhalidi

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Background: MRI forms an imperative part of the diagnostic and treatment protocol for both primary brain tumors and metastasis. Though conventional T1W MRI forms the basis for diagnosis at present, it faces several limitations. Machine learning algorithms require less expertise and provide better diagnostic accuracy. Objective- This systematic review and meta-analysis aimed to compare the diagnostic performance of conventional MRI v/s machine learning (ML) algorithms for brain tumors. Methodology- A Systematic Review of PubMed, Google Scholar and Cochrane databases along with registries (WHO ICTRP and clinical trials) through 1980-2021 was done. Original articles in English evaluating Conventional MRI or ML algorithms with/without usage of reference standard were included. Data was extracted by 2 independent reviewers and Meta-analysis was performed using bivariate regression model. Results – The study protocol was registered under PROSPERO (CRD42021289726). Twelve studies with 1247 participants were included for systematic analysis and three studies for meta-analysis. ML algorithms had better.

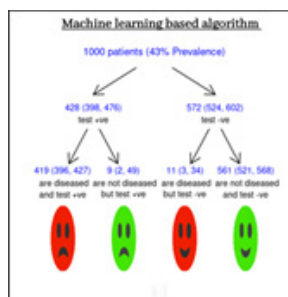


Figure: The sensitivity and specificity calculated machine learning based algorithms used for brain tumour segmentation.

Speaker Biography

Rama Alkhalidi is a second-year medical student at the Royal College of Surgeons in Ireland. She graduated valedictorian of her high school. Rama aspires to transform and ameliorate the quality of healthcare in Syria. Interests include cancer therapy, reproductive health, and regenerative medicine.

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 Notes:

Unveil the role of Adenosine A2a receptor variation in IP3 level through cAMP dependent PKA for the modulation of $[Ca^{2+}]_i$

Tuithang Sophronea

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A2A receptors coupled to Gs/olf protein and activate Adenylyl cyclase (AC) leading to the release of cAMP, activation of cAMP-dependent PKA, phosphorylation of cAMP responsive element binding protein, ERK. In this study, we investigate the possible role of A2AR in modulation of free cytosolic Ca^{2+} concentration ($[Ca^{2+}]_i$) via cAMP and PKA signalling in stably transfected HEK293 cells. HEK293 cells were induced by A2A receptor agonist 5'-N-ethylcarboxamide adenosine (NECA) and A2A receptor antagonist, ZM-241385 and caffeine. The Ca^{2+} , IP3 and cAMP levels were measured by Fluo-4AM and Enzyme immunoassay detection method respectively. Moreover, cAMP dependent PKA were determined using PepTag[®] Non-Radioactive Detection. The Ca^{2+} level was elevated with NECA while decrease with ZM241385 and caffeine. Surprisingly, with pre-treatment of PTX (perussis toxin) the release of IP3 (Inositol 1,4,5-trisphosphate) was observed which stimulates Ca^{2+} release from the Endoplasmic sreticulum while decreases with ZM241385 and caffeine. The further evidences also suggests that downstream signaling like cAMP and PKA was elevated in the presence of A2A agonist NECA. Essentially, reverse effect was observed with A2A antagonist ZM241385 and caffeine. However, pre-treatment of PTX and selective cAMP dependent PKA inhibitor, the level of IP3 remained unaffected by either A2A receptors agonist or antagonist. Hence, the study demonstrated that Adenosine A2a receptor has IP3 - evoked Ca^{2+} signaling where the response is potentiated via cAMP/ cAMP dependent PKA.

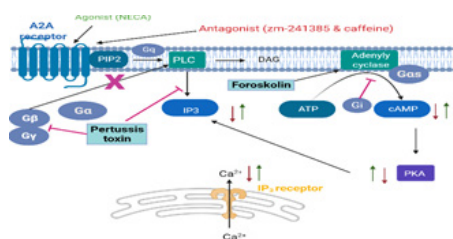


Fig: Schematic representation of the calcium signaling pathways via A2aR in stably transfected A2aR cDNA in HEK293 cells. Based on the results of the present study, we observed that A2aR coupled to G α s /AC/cAMP/PKA signalling in HEK293 cells where PKA phosphorylation results in the modulating of IP3 level. Therefore, calcium signalling via A2aR is IP3 dependent. Upward Arrow line indicate increase/ activation and downward arrow line indicate decrease/inactivation. Blunt end line represents inhibition. Figure was generated using biorender

Speaker Biography

Tuithang Sophronea is currently a Ph.D. Researcher at Dr. B.R Ambedkar Center for Biomedical Research, University of Delhi, India. She has done her B.Tech in Biotechnology from Sardar Vallabh Bhai Patel University of Agriculture and Technology, her MSc Biotechnology in Indian Institute of Technology, Bombay, and her Ph.D. from Delhi University in the field of Biomedical/Medical Engineering.

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 Notes:

Hasad Khabees (Malicious Envy), Ghibtah (Descent Envy) and Shamatah (Schadenfreude): Insight from Scriptures and Medical Sciences

Iqbal Akhtar Khan

Independent Scholar, Pakistan

Introduction: Hasad is an Arabic word which has been used in Holy Quran with different meanings, according to the context. It is widely accepted substitute in English is Envy which has been defined by the American Psychological Association as: “a negative emotion of discontent and resentment generated by desire for the possessions, attributes, qualities, or achievements of another (the target of the envy)”. The Envy, a complex and perplexing passion, is simultaneously a fascinating and a dreadful emotion with positive and negative facets depending upon the doctrine of Khair (good) and Sharr (evil). It has been discussed under two entities:

Descent (or Benign, Emulative, Admiring, White). It is a morally laudable approach, with productive and motivational tendencies. It is also called Ghibtah which is defined as the wish for oneself the same blessing without any idea of the latter, losing it. This is not only permissible but also desirable. Malicious (or Invidious, Destructive, Black, Envy Proper). It is a morally reproachable approach with frustrating and negative feelings. It is actively malevolent, being focused on pulling down the envied to own level and believing oneself to be capable of taking the good away from the envied taken as a rival. Its Arabic equivalent is Hasad Khabees. The effects of malicious envy, on the envied, are detrimental ranging from mental anguish and physical damage (temporary or lifelong) to taking life as is evident from the history. For the envier, the envy, itself is a punishment both bodily and spiritually. The malice of the envier ultimately turns against its own self and destroys the personality of the envier before destroying the envied one.

Schadenfreude, the feeling of satisfying disdainfulness, is a compound of the German nouns Schaden, meaning "damage" or "harm", and Freude, meaning "joy". It is, therefore, joy over some harm or misfortune suffered by another. Its Arabic equivalent is Shamatah which means joy over the affliction of the opponent. It has been shown that the actuating force or the inciting factor for schadenfreude is malicious envy. The current set of studies, as wrapped up by van de Ven, et al, conclude that schadenfreude is independent of other known

antecedents such as perceived unreservedness of the other's advantage, disliking of the other, anger, and inferiority.

Historical Considerations: It is a historic fact that the malicious envy, the root of all evils, is the first sin to be committed in the celestial realm and also the first one on the face of earth. The Holy Quran tells us four stories, linked to malicious envy: the story of Satan, refusing to obey command of the Almighty to prostrate before Adam, another wicked act of Satan who beguiled Adam and his wife while they were in paradise. The third story is about the murder of one son of Adam by the other. The fourth story is of Prophet Yousaf (Joseph) who was victim of malice by his stepbrothers. As described in Ramayana (Hindu sacred text), Lord Ram (a major deity in Hinduism) fell victim to malicious envy of his stepmother and had to be exiled for 14 years.

Theological considerations: All the five major religions (Christianity, Islam, Buddhism, Hinduism, and Judaism) condemn malicious envy. The theologians rate it among disastrous emotions, detestable sins and vices.

The book of Proverbs, examples of traditional Biblical Wisdom, has an elevating influence on the intellect of the readers:

1. “Wrath is cruel, and anger is outrageous, but who is able to stand before Envy?” - Proverb 27:4 AKJ Version
2. “A heart at peace gives life to the body, but Envy rots the bones” - Proverb 14:30 NI Version

Whereas the distribution of bounty is entirely at the discretion of The Supreme Bestower, the ‘Chapter 16- al-Nahal’ of Holy Quran explains it as “God has caused some of you to excel in earning livelihood over others” {16:71}. The envier, by protesting against the divine distribution, in practice refutes the Decision-Making Attribute of The Almighty, The All-Giver and The All-Wise.

The Last Messenger has advised to take refuge from God for the difficulties of severe calamities, having an evil end and a bad fate and from the malicious joy of enemies (Hadith 6616–Sahih Bukhari).

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Anatomical Considerations

The identification of ‘Envy Spot on the Brain’ is a marvellous scientific discovery which proposes a neuro-cognitive mechanism of a psychologically rewarding reaction, schadenfreude and its relation to malicious envy. The key findings by Takahashi et al were:

- Stronger dACC (dorsal Anterior Cingulate Cortex) activation was observed when one felt stronger envy.
- At the behavioural level stronger schadenfreude was related to stronger envy.
- Schadenfruede arose when misfortune occurred to a person who was advantaged and self-relevant.
- Striatal activation was observed when misfortune happened to an envied person but not when it happened to a non-envied one.

Future Considerations: It is tempting to postulate that the surgical procedure ‘Deep Brain Stimulation’, presently employed successfully to treat a variety of disabling neurological symptoms (mainly of Parkinson’s Disease), will be able to treat envy, and the dream of an ‘envy free set up’

would become a reality.

Conclusion: Envy is a social-comparison-based emotion which , according to Dorothy Sayers, is the Great Leveller: If it cannot level things Up it will level them Down”. Whereas the pulling down motivation ends in Hasad (Malicious Envy), the pulling up stimulus results in Ghibtah (Decent Envy). A praiseworthy advice is from Imam Ghazali “What is destined (for you) will reach you, even if underneath the two mountains. Conversely, what is not destined (for you), will not reach you, even if between two lips”. Regarding Schadenfreude, there is warning from The Last Messenger:[‡]

Do not rejoice over the misfortune of your brother (envied), lest Almighty God has mercy upon him and subject you to trials” (Sunan Tirmidhi 2506).

Speaker Biography

Iqbal Akhtar Khan is the Professor and Chair of the University College of Medicine, the University of Lahore, Pakistan. He has done many kinds of research in the field of Ibn Sina Medicine and has reached great milestones.

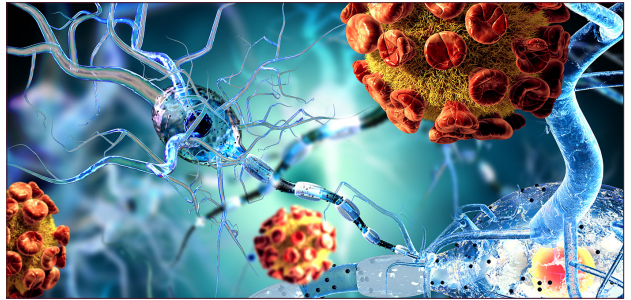
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Notes:

Accepted Abstracts

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A Novel Approach to Alzheimer's Disease

Susan Greenfield

Founder and CEO of Neuro-Bio Ltd., UK

To date all approaches to developing an effective treatment for Alzheimer's disease have failed, and there is an increasing lack of confidence in the efficacy of combating the well-established targets amyloid or tau. Moreover, existing marketed therapies for Alzheimer's disease target symptoms in the late stages, but don't arrest progression. We have focused instead on identifying the pivotal basic mechanism and have subsequently suggested neurodegeneration is an inappropriate reactivation of a developmental mechanism that becomes toxic in the context of the mature brain, selectively in the subpopulation of primarily vulnerable cells. The key signalling molecule underlying this process is a 14mer peptide, 'T14'. T14 is (a) is doubled in the Alzheimer brain and CSF; (b) can potentially be monitored in plasma, as a blood biomarker,

during the 10-20 years before cognitive impairment is apparent; (c) can drive the subsequent, secondary production of amyloid and p-tau; (d) can be intercepted pharmaceutically to stabilise any further cell loss by means of a first-in-class type of drug, i.e. a cyclised variant (NBP14) of the linear toxin T14 itself. NBP14 has significantly beneficial effects on the memory and brain histochemistry of Alzheimer model mice. The eventual goal will be to develop a treatment package whereby the biomarker monitored in a routine blood test could detect presymptomatic degeneration already underway, such that a variant of the cyclised T14 drug could be given immediately that stabilised any further cell loss. The symptoms of cognitive impairment would this be prevented from ever appearing, an effective 'cu.

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Maladjustment of pressure settings of programmable shunt valves by weak Magnetic fields

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Hydrocephalus is caused by the progressive accumulation of cerebral spinal fluid (CSF) within the intracranial space. Resulting in an abnormal expansion of cerebral ventricles and, consequently, in brain damage. The standard treatment of hydrocephalus in children and adults is the implantation of a shunt valve (i.e. Codman-Hakim shunt valve from Johnson&Johnson). This study shows easy maladjustment of a Codman-Hakim programmable valve even with magnetic field strengths as they occur in daily life. A 53-year-old man presented to Forensic Psychiatry with triventricular hydrocephalus. Therapeutically, a ventriculo-peritoneal Codman-Hakim programmable shunt valve was implanted (originally set at 60 mmH₂O). During the patient's

hospitalization, the pressure setting of the valve was randomly changed at least six times, resulting in misleading "psychiatric behavior." It was determined that electromagnetic door locks of the hospital ward were the cause. Both - pressure settings of the patient's Codman-Hakim programmable valve as well as pressure settings of a new valve - were unwantedly modified simply by walking through standard doors in a hospital ward. Thus already weak magnetic fields (< 200 mT) might cause changes in the pressure settings of programmable shunt valves and therefore lead to maladjustment. Patients should be informed and pay attention to using everyday life's devices, like rod magnets or mobile phones.

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How to apply Artificial Intelligence in estimating Mental Illnesses, 2021

Kadhim Alabady

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Background: Mental health is without doubt one of the most vital aspects of any child's development. It is an essential part of children's overall health and has an impact on the child's physical health and their ability to be successful. Mental health increases children's opportunity to live up to their full potential and do what is best for themselves and the people around them.

Purpose: To estimate the expected number of children or adults with mental disorder through.

Method: In order to carry out this assessment we applied qualitative modeling (Artificial Intelligence approach) and quantitative methodology.

Key findings: Artificial intelligence can be used as a tools to measure the differences level of actual registered cases with

ASD and compared with the expected cases with foe a general population. Annual birth figures can be applied to estimate the risk of developing autism spectrum disorder (ASD) in future. Studies of eating disorders are so effective to determine the needs of required services for girls aged 13–19 years affected with anorexia nervosa and bulimia nervosa. An estimated 5% of children and 2.5% of adults have ADHD. ADHD is often first identified in school-aged children when it leads to disruption in the classroom or problems with schoolwork. These figures can be applied to assess the expected number of people with ADH in the community. Applying the postnatal depression prevalence rates (10–15%) to the number of annual total live births or pregnancies in estimating postnatal depression among women.

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Theory of mind deficits in Bipolar Disorder in Remission

Shravani Chauhan

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Aims: Theory of mind (ToM) is the ability to represent one's own and other's mental state. Studies in bipolar affective disorder show mixed results possible due to confounding factors like intelligence, attention, phase of illness and current mood. Purpose of this study is to study ToM in remittent bipolar disorder patients and compare with normal controls to find if there are residual deficits during remission.

Methods: 40 bipolar patients in remission and 40 age and sex matched controls were recruited. Clinical remission for 3 months with YMRS < 4 and HAM-D < 7 was inclusion criteria. ToM was assessed by Faux Pas test. Data was analysed using SPSS-11.5 for Windows with parametric and non parametric tests as indicated. Level of significance taken as $p < 0.05$ (two tailed).

Results: Mean age of onset of illness in patient group was 23.8 years with duration of illness 11.3 years. Mean number of episodes 6.7 and duration of remission 4.15 months. ToM test result revealed deficit in recognizing social cues in faux pas test by bipolar patients as compared to normal controls. There was no difference between both groups in test result on control stories.

Conclusion: Results suggest that ToM deficits are present in bipolar disorder patients even during apparent clinical remission, indicating it may be a trait marker of the illness. There is no deficit in understanding a regular social context without faux pas. It also revealed that there is no correlation with ToM and duration of illness.

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Effect of Nursing instructions on Diabetic patients' knowledge about Peripheral Neuropathy and foot care

Salwa Abd El Gawad Sallam

Menoufia University, Egypt

Diabetic peripheral neuropathy occurs in about half of the diabetic patients and it increases the risk of foot problems. Aim: To assess the effect of nursing instructions on diabetic patients' Knowledge about peripheral neuropathy and foot care. Research design: A quasi experimental research design was used. Sample: purposive sample was used to select 60 adult diabetic patients. Setting: outpatient diabetic clinic at King Khalid Hospital, Hail in KSA. Tools: - Structured interview questionnaire was developed by the researchers to assess sociodemographic, medical data and Diabetic patient's knowledge about peripheral neuropathy and foot care. Results:

There was a highly statistically significant improvement of the studied group total knowledge about diabetic peripheral neuropathy as well as about foot care after one week and after three months of intervention than pre intervention. Conclusion: Implementation of nursing instructions regarding peripheral neuropathy and foot care was effective in improving diabetic patients' knowledge about them. Recommendations: Applying nursing instructions regarding peripheral neuropathy and foot care with a large sample in different settings to enhance and confirm the current results.

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Health and Wellness in the midst of Covid-19, an emotional relationship

Santiago Restrepo Garizabal

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The Covid-19 outbreak has caused fear, the growing number of patients and suspected cases, and the increasing number of cities and countries affected by outbreaks have sparked public concern about the possibility of becoming infected. In several countries it can be seen that fear is increasing. We will address important issues that revolve around public health and mental health. The chapter was developed from a research results review perspective where the results of published research on Covid-19 between 2019 and 2020 are analyzed, systematized and integrated, in order to account for progress and development trends around this matter. The future is difficult to anticipate due to this COVID pandemic that continues to grow in many countries despite vaccines and advances in medicine. Due to the outbreak of

the coronavirus disease, the WHO declares a global pandemic with a health emergency on all continents as of January 30, 2020. Chen, Liang, Li, Guo, Fei, Wang, He, Sheng, Cai, Li, Wang and Zhang (2020) carried out a psychological treatment addressing three parties: the medical team with common psychological problems; advice on how to support the psychological problems of patients and finally how to manage their own stress. On the other hand, they worked only with medical personnel who care for people with Covid-19 and its effects on psychological problems. In the end, early strategies are proposed that aim to prevent and treat indirect injuries in medical personnel and the general public.

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Therapeutic Ketosis and the broad field of applications for the Ketogenic Diet: Ketone Ester applications and clinical updates

Raffaele Pilla

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It has been recently shown that nutritional ketosis is effective against seizure disorders and various acute/chronic neurological disorders. Physiologically, glucose is the primary metabolic fuel for cells. However, many neurodegenerative disorders have been associated with impaired glucose transport/metabolism and with mitochondrial dysfunction, such as Alzheimer's/Parkinson's disease, general seizure disorders, and traumatic brain injury. Ketone bodies and tricarboxylic acid cycle intermediates represent alternative fuels for the brain and can bypass the ratelimiting steps associated with impaired neuronal glucose metabolism. Therefore, therapeutic ketosis can be considered as a metabolic therapy by providing alternative energy substrates. It has been estimated that the brain derives over 60% of its total energy from ketones when glucose availability is limited. In fact, after prolonged periods of fasting or ketogenic diet (KD), the body utilizes energy obtained from free fatty acids (FFAs) released from adipose tissue. Because the brain is unable to derive significant energy from FFAs, hepatic ketogenesis converts FFAs into ketone bodies-hydroxybutyrate (BHB) and acetoacetate (AcAc)-while a percentage of AcAc spontaneously decarboxylates to acetone.

Large quantities of ketone bodies accumulate in the blood through this mechanism. This represents a state of normal physiological ketosis and can be therapeutic. Ketone bodies are transported across the blood-brain barrier by monocarboxylic acid transporters to fuel brain function. Starvation or nutritional ketosis is an essential survival mechanism that

ensures metabolic flexibility during prolonged fasting or lack of carbohydrate ingestion. Therapeutic ketosis leads to metabolic adaptations that may improve brain metabolism, restore mitochondrial ATP production, decrease reactive oxygen species production, reduce inflammation, and increase neurotrophic factors' function. It has been shown that KD mimics the effects of fasting and the lack of glucose/insulin signaling, promoting a metabolic shift towards fatty acid utilization. In this work, the author reports a number of successful case reports treated through metabolic ketosis

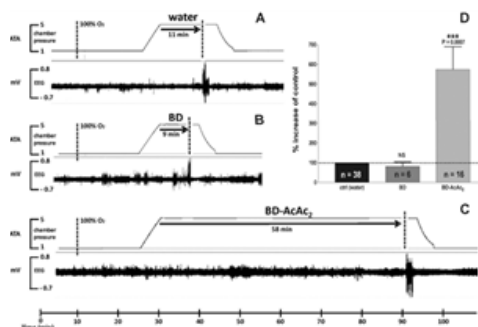


Figure: Ketone Ester significantly increased resistance against Central Nervous System Oxygen Toxicity seizures (D'Agostino D.P. et al., 2013 Am J Physiol Regul Integr Comp Physiol. 304(10):R829-36).

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Building and maintaining an alliance with a child patient

Rina Lubit

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Child therapists frequently inadequately appreciate certain aspects of a child's experience, ultimately undermining the therapy. Children have limited ability to protect themselves, and expect adults to take concrete actions to help them. They are repeatedly devastated when the adults they trusted fail them by refusing to believe them when they express suffering and pain. Children are extremely sensitive to invalidation, even when minor (that is, from the perspective of an adult). Actively validating the child's experience is crucial to building and maintaining a therapeutic relationship. Children have a right to adult assistance and protection; if the parents fail to provide this to the child, it is the moral

imperative of the child's therapist to step in and take actions to prevent the child, even from a parent. Being able to do so requires a thorough understanding of the situation. However, forcing a child to share memories and emotions they don't yet feel safe to share is experienced as invasive, and a betrayal of the trust the child places in the therapist. In the world of a child, trust once broken can never be recovered. Building and maintaining an alliance with a child patient is vital to the wellbeing of the child. Failure to do so destroys the therapeutic relationship.

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