Alternative therapies of neuropsychiatric disorders

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Abstract

Therapies are termed as Complementary when used in addition to conventional treatments and as alternative when used instead of conventional treatment. These therapies are less researched than conventional therapies & some therapies have been continuing same concepts from ancient times.

Both psychiatrist & physicians can use these therapies in conjunction with conventional treatment. In recent times, research has escalated in various modalities of complementary & alternative medicine, but further research is required testing their effectiveness & efficacy.(1) This review article aims at delineating various modalities of complimentary & alternative medicine.

Introduction

US Government's agency for scientific research has found usefulness & safety of complementary & alternative therapies. In India Indian Board for Alternative Medicine (IBAM) an Internationally Recognized Government Institution is providing world-wide research in the field of complementary and alternative medicines. Board has brought alternative medicines to the attention of the masses and trained students in India and abroad through its various courses in the different disciplines of alternative medicines such as acupressure, acupuncture, aromatherapy, electro homeopathy, reiki, etc to further facilitate the study of alternative medicines and provide a high standard of educational programmes.(2)

Prevalence: Roy et al have found use of CAM was more among doctors (58%) when compared with the patients (28%). Most common indications for CAM usage among the doctors were low back ache (32%) & among patients was fever 38%. About 51% patient uses CAM immediately after getting unwell. About 50% of CAM patients were advised by their family (43%) and friends (27%) and only 13% were referred by doctors.(3)

There are various types of CAM Practiced in many part of World with following name:

a) **Acupuncture Therapy:** Acupuncture.
b) **Mind-Body Therapies:** Biofeedback, Yoga, Breathing Exercises, Hypnosis, Imagery (Psychotherapy), Laughter Therapy, Meditation, Relaxation Therapy.
c) **Sensory art Therapies**: Acoustic Stimulation, Dance Therapy, Music Therapy, drama therapy.
d) **Nutrient supplementations.**

Ayurveda: Ayurveda, a Sanskrit word meaning the knowledge of life or the science of perfect health. Ayurvedic medicine, as practiced in India, is one of the oldest systems of medicine in the world. Three ancient books named Charaka Samhita, Sushruta Samhita and Astanga Hridaya were written in Sanskrit more than 2,000 years ago & are considered the main texts on Ayurvedic medicine.(3)

Historical aspect: Ayurveda flourished throughout the Indian Middle Ages. The medical works of both Sushruta and Charaka were also translated into the Chinese language in the 5th century & into the Arabic and Persian language in 8th century.

Fundamentals: Fundamentals are based on human factors on intrinsic causes, not extrinsic causes. Civilization may change, human habits may change, the environment may change but humanity remains the same.(5)

Tridosha- Vata, Pitta and Kapha.

They literally mean the darkness and brightness of the mind or negative thoughts in the mind. These impurities or imbalances are called 'doshas'. Treatment process combine mind, body & soul.

Eight components of Ayurveda(6)

a) Kayachikitsa: Corresponds to modern day general medicine.
b) Kaumara-bhṛtya: Corresponds to modern paediatrics.
c) Salya-tantra: Corresponds to general surgery.
d) Salakya-tantra: Treatment of ailments affecting ears, eyes, nose, mouth, etc. ("ENT").
e) Bhutavidya: Study of possessing spirits, and the people whose minds are affected by such possession.
f) Agada-Tantra: toxicology.
g) Rasayana-tantra: Involves chemical & tonics for increasing lifespan, intellect and strength.

h) Vajikaraṇa-tantra: Involves use of aphrodisiacs and treatments for increasing the volume and viability of semen and sexual pleasure.

Mental Disorders described in Ayurveda[7]

a) Unmada; Insanity.
b) Apasmara: Epilepsy.
c) Avasada: Depression.
d) Citto Udvega: Anxiety neurosis.
e) Manasa Mandata: Mental Retardation.
f) Atatva abhinevisha: Obsessive Disorders.
g) Madatyaya: Intoxication.

Describes three 'guna' of Mind (manas); Satwa, Raja &Tama. Disease is due to imbalance of the 'tamas' or 'rajas' in the mind & these are termed as 'Doshas of mind'.

NCCAM (National centre for complimentary and integrative medicine) research- Most clinical trials were small, problems with research designs, or lacked control groups. Researchers have studied Ayurvedic approaches for schizophrenia; however, scientific evidence for its effectiveness is inconclusive.[8]

Homeopathy: Homeopathy method of therapy developed in Germany by Samuel Hahnemann at the end of the 18th century. There are three unconventional theories.

Homeopathic physician uses micro-doses of medicine to cure ailments & these remedies are derived from plants, such as red onion- arnica, crushed whole bees, white arsenic, poison ivy, belladonna, these are formulated in sugar pellets.

Follow two laws:

1) "Law of minimum doses" means that lower the dose, greater its effectiveness.
2) "Like cures like" means that a disease can be cured by a substance that produces similar symptoms in healthy people.[9]

Criticism: Lack of any active molecule. A study published in Lancet, found homeopathy to be a placebo effect.[10] A 2012 review study on homeopathy found replacing an effective conventional treatment with an ineffective homeopathic one can cause adverse effects, as its efficacy is questionable. Some homeopathic preparations involve poisons such as Belladonna, mercury arsenic, and poison ivy, which are highly diluted. In rare cases, the original ingredients are present at detectable levels. Instances of arsenic poisoning have occurred after their use.[11]

Siddha medicine

Siddha medicine is a system of traditional medicine originating in ancient Tamilakam in South India. The paper deals with the epigraphs of the Chola emperors Veera Rajendra Deva (1063-1069 AD) and Raja Raja III (1216-1256 AD), found at the temples of Thirumukkudal and Vedaranyam, with emphasis on the treatment given to the residents of the attached hospitals with special reference to treatment of mental disorders.[7] Siddha medicines defined physical diseases as 'Pinni' as well as psychological diseases as 'Noi'. The 'Kirukai Nol 64′ of Agasthiar is the noteworthy book of Siddha medicine. Kirukai Nool describes 18 psychiatric diseases.[12]

The another book Kirusa Nithanam the symptoms for the psychological disorders defined as follows: standing with upper limbs, restlessness, singing meaninglessly, dancing, laughing, changing postures, sleeplessness, embracing others, loose talking, murmuring, spitting on others, wandering, sexual aggression, rolling on the floors, standing naked, removal of clothes. Siddhars believed that the root cause of the abnormal behaviours are evil desire, disordered thoughts, passions, morbid imaginations, excessive fear, envy, anger, and immoral activities. 'The Karma' or off-shoots or chronic disease are mainly caused by the Man's previous actions. The Law of Karma' describes that a man's sin actions, sin actions of man are the root cause of the present life, present life is guided by our karma. Siddhars believed that the mental abnormalities are caused by the evil karmas of the man or his/her ancestor's karma. Another important reason is 'Thrithosam'. If the Pitham increased, the mental abnormalities occurred. Siddhars also believed that the abnormalities may occurred due to sleeplessness and breaking of Varma points, for example, due to the damages of Uchikala Varmam, Suliyadivarmam and Thudi Narambu (Lada Soothiram 1200) traumatic disorders may occur.[13]

Remedies recommended by the siddhars for abnormalities: Siddhars recommended several medicines for mental abnormalities. They prescribed Avizthem (Medicines) as well as Manthiram (Psychotherapy). Some of the medicines have been listed here:

a) Thuvalai-Anointing-external application: Paruthi leaves (Cossipium Herbaceum), Karunochi leaves, Sirusundai leaves (Solanum Torvum,Kattu mullai flowers.Take equal proportion and mixed with honey and Sarvangam (incense powder). Then, give Thuvalai – annointing- external application.
b) Vedhu (Steam bath): Meni leaves (Acalypha Indica), Kilukiluppai leaves, Thumbai leaves (Leucas aspera), Take equal proportion. Make smoke with coconut shell in fireplace.
c) Ullukku koduthal (Oral route): Meni leaves (Acalypha Indica), Kilukiluppai leaves, Thumbai leaves (Leucas aspera), Thippilli (Piper Longum). Take each equal to a coin-weight (12gram). Make all the leaves into powder. Give this orally mixing this powder with water.
d) Nasium– Nasal application, Karunochi leaves, Thumbai leaves (Leucas aspera), Garlic (Allium

Sativum Linn). Take each equal to a coin-weight (12 gram). Grind all with Sesame oil. Give Nasal application in the right nasal path.

e) Kallikam – Ocular application, Vasambu (Acorus Calamus Linn), Sandal (Santalum Album Linn)Pepper (Piper Nigrum L.), Mahilam Flower virai (Mimosops Elengi),Garlic (Allium Sativum Linn)Turmeric (Curcuma Longa).

f) Take each equal toa coin-weight (12 gram). Grind all with cow milk and make it like a pepper size balls (Kullikai). Then, dry all balls in sunlight. Dissolve a kulikai in mother-milk and give ocular application. Take bath using plenty of water.

Unani: The Hellenistic origin of Unani medicine is still visible in its being based on the classical four humours: phelgm (Balgham), Blood (Dam), Yellow bile (Ṣafra) and Black bile (Sauda), but it has also been influenced by Indian and Chinese traditional systems.[10] Influenced by Indian medical teachings of Sushruta and Charaka.[14]

Acupuncture

Acupuncture is a form of alternative medicine which involves insertion of micro-needles on specific points in body (acupoints) lying on meridian, thereby increasing blood flow throughout the body.[15,16]

Mechanism of Action (traditional): According to ancient Chinese medicine, Qi was believed to be flowing from primary body organs through channels known as "meridians" & patient experiences a burning sensation as well as fullness in body part where it is applied.[17,18]

Modern hypothesis:

1. CNS mechanism:
   a. Opioid theory: Opioid activation leads to the processing of opioid peptides from their precursor, proenkephalin. Also, it releases beta-endorphin in brain, thereby alleviating pain. These findings are also supported by fact that, naloxone an opioid antagonist abolishes this process.[19]
   b. PERI-AQUEDUCTAL GRAY (PAG) is proposed as an integration centre for somatic and autonomic responses to nociceptive and other stressful stimuli. Acupuncture reduces expression of P2X receptor in this region of brain, thereby reducing pain.[20]
2. Cellular pathway: Analgesia and anti-inflammatory effects are associated with the down regulation of spinal p38 MAPK activation.[22] It also reduces reactive oxygen species , thereby reducing inflammation & associated pain, therefore it is proposed to be used in chronic neuropathic pain associated with spinal cord injury.[23] There is evidence that in spinal cord injury , there is microglial activation,[24] acupuncture reduces pain by reducing oxidative damage in spinal cord.[25]

Clinical Uses:

1. Neuropathic Pain: studies have shown the effectiveness of acupuncture on neuropathic pain of malignancy, diabetic neuropathy, phantom limb pain, and below-level central neuropathic pain.[26-31]
2. A study done by Dennehy EB et al in bipolar II patients found favourable results for acupuncture in depressive patients (for non –psychiatric health issues) as well as for manic patients (mood elevation).[32]

Acupuncture and safety issue

There are case reports of acupuncture induced bacterial aortitis associated with pseudoaneurysm formation as well as bilateral pneumothorax developing after therapy.[33,34] Few studies have found 295 cases of infections; mycobacterium was the most common pathogen (96%) & likely sources of infection include towels, hot packs or boiling tank water, and reusing reprocessed needles.[35]

Biofeedback

Biofeedback by using instruments, provides continuous status of one's own autonomic nervous system (skin temperature, heartbeats, brain waves) with a goal of being able to manipulate them at will.[36]

Uses:

a) One study found biofeedback to be effective in migraine including psychological stress and headache-related disability.[37]
b) In a meta-analysis, acupuncture was found effective to be in paediatric migraine,[38] as well for tension type headache.[39]

Meditation: It is a process of making one's own mind to focus on one thing by eliminating all environmental stimuli. A wide variety of techniques are used to eliminate all outside stressful interferences.[40]

Type Meditation

1. **Mindfulness:** Mindfulness-Based Stress Reduction program was started in 1979 by Jon Kabat-Zinn, has defined mindfulness as 'moment to moment non-judgmental awareness.[41] Person performing mindfulness focuses on present moment & it can be achieved through training & exercise.[42,43]
   A study done by Perich T et al have found that mindfulness meditation practice was associated with improvements in depression and anxiety symptoms in Bipolar disorder.[44]
   Other studies have found usefulness in anxiety as well as substance abuse.[45,46]
2. **Jacobson's Progressive Muscle Relaxation:** was developed by American physician Edmund Jacobson in the early 1920s. In this exercise one tenses and then relaxes muscle groups in a

sequential pattern while concentrating on how they feel along with breathing exercises in between. Found useful for various conditions especially extreme anxiety. PMR gradually decreases activity in the superior frontal gyrus (SFG), inferior frontal gyrus (IFG), and posterior cingulate cortex (PCC).[47] Clinical uses include insomnia, chronic pelvic pain, muscle spasm.[48,49]

3. **Sahaja yoga meditation:** is not only the name of movement but also the type of technique by which it is performed.[50] It regers to state of self-realization (encounter with Reality) which is done by kundalini awakening.[51]

Beliefs: Sahaja yoga followers believe that apart from physical body, there is one subtle body consisting of nadi (channel) & chakras (energy centre). Chakras can be balanced by awakening of kundalini which lies in sacrum.[52]

Yoga

According to West, yoga is simply a group of physical exercise for strengthening the body, improving flexibility & it also prevents a variety of bodily ailments. According to Eastern philosophy, it is a group of physical, mental, and spiritual practices or disciplines which originated in ancient India & are considered a pathway to spiritual growth.[53] There is a broad variety of Yoga schools, practices, and goals in Hinduism, Buddhism, and Jainism. Among the most well-known types of yoga are Hatha yoga and Rāja yoga.

The ultimate goal of Yoga is "moksha prapti"

Types of Yoga: Classical yoga, Ashtanga yoga, Hatha yoga, Tantra yoga.

Applications/Benefits: Yoga is a low-impact activity that provides the same benefits as any well-designed exercise program. Mindfulness Based Stress Reduction (MBSR) programs include yoga as a mind-body technique to reduce stress, studies have found increased activity especially in left pre-frontal cortex while person doing it attained a blissful state.[54]

A systemic review found yoga to be effective in psychiatric symptoms, quality of life & social functioning.[55] Other studies have found beneficial effects of yoga in children suffering from Attention deficit Hyperkinetic disorder, bipolar disorder patients (in improving anxiety & also had positive physical effects including weight loss & increased energy), OCD patients showed improvement on Y-BOCS, Symptoms checklist 90-Revised Obsessive Compulsive (SCL-90-R OC) and Global Severity Index (SCL-90-R GSI) scales, Profile of Moods scale (POMS), Perceived Stress Scale (PSS), and Purpose in Life (PIL) test).[56,57,58] Most common style of yoga is hath yoga & most common adverse effects are physical injury & pain.[57]

Diet modification

Docosahexaenoic acid (DHA) is an omega-3 fatty acid that is a primary structural component of the human brain, cerebral cortex, skin, and retina. It can be synthesized from alpha-linolenic acid or obtained directly from maternal milk (breast milk), fish and algae oil.

Clinical Uses: E Y Sivrioglu et al have found beneficial use of omega-3 fatty acids in reducing positive & negative symptoms as well as akathisia in patients treated with haloperidol in schizophrenia.[59] In a review done by Turnbull T et al in 2008 have found beneficial effects of Omega-3 fatty acid supplementation in reducing bipolar symptoms.[60] In a study by Buydens-Branchey L involving n-3 PUFA supplementation in substance abuser patients found it to be beneficial in treatment of associated anxiety spectrum disorders with substance abuse.[61]

Uses of nutrients & vitamins

Vitamin B12 involved in DNA synthesis and it is also important for functioning of nervous tissue and red blood cell. The average dose for women is 2.4 mcg/day and slightly higher in pregnancy i.e., 2.6 mcg/day. Deficiency causes fatigue, lethargy, and poor memory. In Psychiatric disorders B12 taking important role in Depression, Dementia and neuropathy.

Thiamine (vitamin B1): Forms thiamine pyrophosphate is a kind of coenzyme. The deficiency which occurs in alcoholism (both acute & chronic) and GI surgery. Deficiency of this vitamin causes disease like Wernicke-korsakoff syndrome and beriberi.

Zinc: Needed for cell division, formation of growth factors & steroid receptors, protein & DNA synthesis. Its deficiency causes mental lethargy & neuro-sensory disorders.[62] A study done by Sayyah M et al have found supplementation of nutrients such as zinc to beneficial in OCD along with standard treatment.[63] In a study by Kaplan BJ et al involving primarily chelated trace minerals and vitamins, administered in high doses found that for those who completed the minimum 6-month open trial, symptom reduction ranged from 55% to 66% on the outcome measures; need for psychotropic medications decreased by more than 50%.[64]

S-Adenosyl methionine

S-Adenosyl methionine (SAMe) is a common co-substrate involved in methyl group transfers & trans-sulfuration its uses depression and osteoarthritis. The adverse effects causes hypomania, hyperactive muscle movement. Study by Bressa GM in 1994 found that, the efficacy of SAMe in treating depressive syndromes and disorders is superior with that of placebo and comparable to that of standard tricyclic antidepressants. Since SAMe is a naturally occurring compound with relatively few side-effects, it is a potentially important treatment for depression.[65] Sharma et al found S-

adenosyl to beneficial in neurocognitive, substance use, psychotic disorders and comorbid medical conditions.[66]

Acetylcarnitine

It is broken down in the blood by plasma esterases to carnitine which is used by the body to transport fatty acids into the mitochondria. In a drug trial involving geriatric population, acetylcarnitine was found to be effective in reducing depressive symptoms.[67] In a study by R Zanardi, involving dysthymic patients, they have compared Two hundred and four patients were randomised and treated with ALCAR 500 mg b.i.d. or amisulpride 50 mg u.i.d. in a double-blind study, for 12 weeks, both groups showed significant benefits & tolerability of acetylcarnitine on chronic use was better.[68]

Withania somnifera

The main chemical constituents are alkaloids and steroidal lactones. These include tropine and cuscohygrine. The leaves contain the steroidal lactones, anolide & withaferin A, which was the first to be isolated from the plant. *Ashwagandha* root extract causes reduction of anxiety and stress (potentially mediated by reducing cortisol levels) the extract is also reduces total cholesterol levels.[69]

Vinpocetine

Vinpocetine is a synthetic derivative of the vinca-alkaloid vincamine an extract from the lesser periwinkle plant.

Mechanism of action: It is selective inhibitor of Ca(2+)-calmodulin dependent cGMP-PDE, thereby it relaxes smooth muscle blood vessels & increases blood flow to brain. This mechanism is also implicated in neuroprotection.[70] There is also increment in levels of cerebral 5-hydroxyindole acetic acid (5-HIAA) levels after treatment and transitorily enhanced 5-HT levels 2 h following (i.p.) treatment. Catecholamine levels were similarly increased 4-6 h following administration of vinpocetine.[71] Hadjiev and Yancheva (1976) found an improvement in memory function using a simple word recall test (both immediate and delayed recall) following oral treatment (5 mg t.d.s.) with the drug for 1 month.[72]

Ginkgo Biloba

Extracts of ginkgo leaves contain phenolic acids, proanthocyanidins, flavonoid glycosides, such as myricetin, kaempferol, ginkgolides and bilobalides.

Ginkgo extract can be given to patients with mild to moderate symptoms of cerebral insufficiency (function, with, for example, the following symptoms: difficulties of memory, dizziness, tinnitus, headaches, and emotional instability with anxiety).[73] In patients with clear dementia there are probably no positive effects of treatment with ginkgo extract. Dosing range is from 120mg/day-160mg/day & treatment should be continued for 4-6weeks.

L-Theanine

L-Theanine is amino acid analogue of the proteinogenic amino acids L-glutamate and L-glutamine it is a constituent of green tea (Camellia sinensis) comprising 50% of the plants total free amino acids, or 2% of the total content.[74]

Mechanism: crosses the blood–brain barrier where it exerts a variety of neurophysiological and pharmacological effects. Anxiolytic and calming effect is due to its upregulation of GABA and possible modulation of serotonin and dopamine in selected areas. Also increases levels of brain-derived neurotrophic factor. Studies show a neuroprotective effects following cerebral infarct and injury, although the exact molecular mechanism is unknown. Theanine also elicits improvements in cognitive function including learning and memory, in human and animal studies, via a decrease in NMDA-dependent CA1 long-term potentiation (LTP) and increase in NMDA-independent CA1-LTP. Theanine administration elicits selective changes in alpha brain wave activity with simultaneous increase in selective attention during the execution of mental tasks.

Uses: Potential role in reducing anxiety & stress, in learning & memory enhancement & neuroprotection. Further studies are required for confirmation.

Music therapy

Emotional response have been documented in patients after listening to music.[75,76] Music therapy helps patients in expression of feelings. In a meta-analysis by Tseng PT et al found adjuvant music therapy to effective in schizophrenic patients. Benefits were obtained on mood & negative symptoms rather positive symptoms.[77] In a meta-analysis by Zhi Min Shi et al involving children with autism, benefits of music therapy were obtained on mood symptoms, language, sensory perception, behaviour & social skills.[78]

Art therapy and colour therapy

Art therapy and colour therapy focus on the creative art-making process itself, as therapy, or on the analysis of expression gained through an exchange of patient and therapist interaction. In most art therapy sessions, the focus is on patient's inner experience, inner feelings, perceptions, and imagination. While art therapy may involve learning skills or art techniques, the emphasis is generally first on developing and expressing images that come from inside the person, rather than those he or she sees in the outside world.

Clinical benefits: Post traumatic disorder in children in reducing acute stress reaction,[79] helps in

conscious and unconscious expression of the mourning process in adult and child patients,[80] improves quality of life in dementia patients.[81]

Psychodrama

Psychodrama is an action method, often used as psychotherapy, in this method clients use spontaneous dramatization, role playing, and dramatic self-presentation to investigate and gain insight into their lives.[82]

Emotional writing

In a study of 100 students in which 96 to 100 % students given response on coping questionnaire for adolescent (CQA) scale questionnaires, and their mean scores were between 1.0 to 2.5, on subsequent rating on same scale after 1, 2 and 3 months after emotional writing, the mean score reduction were between 0.4 to 2.4. Similarly on Depression Anxiety Stress Scales (DASS) the mean score of responses were also decreased.[83]

Summary

Alternative treatment in neuropsychiatry is an approach that deals the alternative management of psychiatric and certain cases of neurological disorders through various traditional methods like ayurveda, homeopathy, siddha, unani, yoga, meditations and herbs etc. In this method many people takes treat themselves without professional supervision and they claim their beneficial effect. Patients also beliefs that the natural products are safe and side effect free. Though there is less scientific evidence favourable in positive responses. This method has several challenges like evidenced based therapy, efficacy of compound, dosing schedule, new research etc. needs to short out.

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