Review of Treatment of Common Body Disorders by Sound Therapy

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Abstract— **Human beings spread out certain range of measurable frequencies. The level of these radiating frequencies varies with different states of the body's health or illness. This paper demonstrates that each illness/disorder in the human body has different frequency that is always within a definite range and also implies the fact that the human body responds to various beneficial input frequencies given in the form of direct external light and sound. The ill body cells react to very precise levels of frequencies and get cured or eliminated whilst nearby healthy cells remained intact. Thus certain input frequency signals can help to improve physical health and can be used in the treatment various body illnesses. The general human healthy frequency is within the range of 62-72 Hz and when it drops to lower levels it enables the appearance of a variety of diseases. For example at the level of 58 Hz, diseases like cold and flu were more likely to appear. At much lower levels (42 Hz) fatal diseases like Cancer appear in humans and below, whilst death begins at 20 Hz.**

I. INTRODUCTION

Every living cell has a measurable electrical frequency associated with it. The adult human body is made up of different types of cells, a total of about 60-90 trillion cells. Thus the human body acts as a radiation machine. Every living element in our body radiates. Our brain operates on electrical current, our ears absorb sound vibrations, and we produce voices and temperature. The radiations from human body have measurable frequencies on various levels from the entire body down to the cellular level. On mapping these frequencies it turned out quite clearly that these frequencies differ in healthy humans in comparison to ill ones. Moreover it was also discovered that each illness has different frequency that is always within a definite range. It has also been discovered that the frequency corresponding to the healthy state of the human body is within the range of 62-72 Hz and any fluctuation from this specified normal value refers to some sort of disorder in the body. [4]

Any movement of an object in any frequency can be changed by an external intervention of another frequency and the frequency of the human body and its cells is of no exception. During the diagnostic study of the human body cells, yet as the research progressed some frequency signals are applied back to human cells, it was seen that those cells also reacted to direct external light and sound frequencies. The most incredible discovery was that ill cells reacted to very precise levels of frequencies and were cured or eliminated whilst nearby healthy cells remained intact. That means that sets of frequencies directed at inflicting cells of a certain disease had to have these additional elements defined by very precise data parameters, in order to create that desirable impact. The source of such healing frequency elements can be any radio, light and sound device. [4]

Nowadays this elementary area of biomedical engineering, which deals with a large variety of disease-related frequencies have turned into a highly expertise research field. In a way, it had developed to be an application of electronic engineering in the field of medical health care. This field requires in depth knowledge in order to produce effective sets of frequencies. The beginning of the third millennium opens new horizons for frequency medicine and as it seems now, this process has already begun and it looks very promising for the human kind.

II. HEALING EFFECT OF SOUND THERAPY

Sound waves have always been proven to be quite helpful with a wide variety of medical problems [18]. In earlier times physicians and therapists used to treat their patients with instruments that evoked sounds and physical vibrations. Those tools included blowing instruments like horns, trumpets and flutes, variety of string instruments, metal bowls and of course the human voice. Man has a great share of experience in treatment with sound. We can easily examine the basic characteristics of sounds like, volume and frequency because we can sense volume and we can sense intonation. We usually base our reaction to sound effect according to our subjective criteria, which could be our neutral, pleasant or unpleasant experience of it. Yet, when coming to examine sound from a scientific point of view one needs acoustic tools that are much more objective than the human ear in order to study sounds phenomena and effects. [2]

While analyzing the basic characteristics of sounds mathematically, sound can be structurally classified into sound waves and sound particles. Sound is generated by small areas of high and low pressure propagating from the producing source. That creates what is called pressure sound wave or a sound wave. A Sound particle is a measurable mean to depict a sound wave going through a medium (air, solid, liquid). Sound particles are not real physical entities and they exist in physics to enable better understanding and accurate measurement of sound waves. Sound passes via a medium and that includes our body, which is also a medium. Whenever sounds enter our ears and meet our drumhead it creates a vibrating effect that varies according to its frequency and volume. The sound does not stay merely in the ear space, but propagates through bones and tissue and reaches every cell in our body. Our brain has a tremendous ability to analyze sounds and interpret them by using highly complex chemicals and electrical networks to process them. From that respect our sound absorption mechanisms are quite similar to our digestive systems In reality sounds enter the body much faster than most types of directly inserted chemicals. [2]

Some organs in the body react more to certain frequencies than other organs. For example: a highly strident sound has an immediate effect on facial expression and a specific effect of increased sensitivity of jaws and teeth. Another example is the effect of deep base low tone sound on stomach area. The effect of one stroke of a base guitar string is so obvious that one usually does not realize the involvement of a huge complexity of body cells, nerved glands and chemical reactions that produced such effects in an enormous speed. So it is clear that if a person listen to sounds that are carefully tuned to create a specific effect on the frequency of an organ in his body, he can realize that there is a very high probability that such sound or set of sounds can change the organ's frequency and that is the background for understanding how sounds can affect organs' frequencies. [1]

III. BIOFREQUENCY PATTERN OF HUMAN BODY

Bruce Tainio of Tainio Technology in Cheney, Washington, developed BT3 Frequency Monitoring System to measure the biofrequency of human body. After mapping the biofrequency pattern of the human body he used this biofrequency monitor to determine the relationship between frequency and diseases. The table below implies electrical frequency patterns of human body showing significant variations in corresponding to various states of a person's health:

Table I: Biofrequency pattern of the human body.

State of human body	Associated frequency
Brain frequency Beta - Highly alert and focused	14 -30 Hz
Brain frequency Alpha - Relaxed but alert	8 - 14 Hz
Brain frequency Theta - Drowsiness	4 - 8 Hz
Brain frequency Delta - Deep sleep	0.5 - 4 Hz
Visionary Range	120 Hz
Bone	38-43 Hz
Brain frequency at 80-82 MHz	Higher intelligence
Healthy body (neck down)	62-68 Hz
Thyroid and Parathyroid glands	62-68 Hz
Thymus Gland	65-68 Hz
Heart	67-70 Hz
Human cells start to mutate when their frequency drops below	62 Hz
Lungs	58-65 Hz
Liver	55-60 Hz
Pancreas	60-80 Hz
Stomach	58-65 Hz
If the frequency drops just 4 points this is when a headache will start	58 Hz
Disease begins, Like the cold symptoms	58 Hz
Flu invades the body	57 Hz
Viral Infection	55 Hz
when more serious problems come about like pneumonia, Epstein Barr and etc.	52 Hz
Tissue breakdown from disease	48 Hz
Cancer can set in	42 Hz
Death begins at	20 Hz

Invading pathogenic frequencies (toxins & viruses) are low. Positive beneficial bacterial frequencies are higher.

IV. TREATMENT FOR PARKINSON'S DISEASE BY NEUROLOGICAL MUSIC THERAPY (NMT)

Parkinson's disease refers to a group of progressive neurodegenerative disorders that are associated with significant motor disturbances and speech difficulties. The types of PD include idiopathic Parkinson's disease (IPD), Parkinson-plus syndromes (PPS), and symptomatic Parkinsonism. IPD is the predominant disorder, occurring in approximately 80% of diagnosed patients. PPS are the second most common types of the disorder and present in up to 15% of diagnosed patients.[3] [5]

A. Idiopathic Parkinson's Disease (IPD)

Idiopathic Parkinson's disease results from a significant degeneration of the dopaminergic neurons in the substantia nigra of the midbrain and the components of the basal ganglia in the forebrain including the globus pallidus, putamen and caudate nucleus. The presence of intracellular inclusions or Lewy bodies in many of the remaining neurons is viewed as the pathological hallmark of the disease. By the time the clinical motor symptoms of IPD become apparent, the substantia nigra has already lost approximately 60% of its dopamine neurons, and the resulting dopamine neurotransmitter levels in the basal ganglia are already 80% below normal. Consequently, the reduced dopamine levels cause a disturbance in the basal ganglia control circuit (see Figure 1), leading to the presentation of clinical motor symptoms. In addition to the motor symptoms associated with IPD, patients may experience a number of non-motor symptoms during the course of the disease. These symptoms may include disturbances in mood, cognition, sleep, autonomic function and sensation. Depression is a common mood disturbance that may develop in 40 to 60% of people with IPD. Cognitive disturbances may include decreased executive functioning, attention, emotional processing, visuospatial ability and memory loss.[3] [6]

IPD can be mainly contributed by the factors like genetic predisposition, certain exposure to environmental toxins and aging. A global estimate of IPD occurrence is also difficult, due in part, to the different methodologies and diagnostic criteria used in epidemiological studies. However, the prevalence of IPD in industrialised nations has been estimated at 0.3% of general population, and 1% of persons over the age of 60 years. However, despite the current limitations, epidemiological studies have suggested that IPD occurs in all races. However, young-onset IPD can occur in patients who are in their early 50s or younger, with initial symptoms typically appearing between the ages of 21 and 40 years. The survival rate of IPD is approximately 12 years from symptom onset to death.[8]

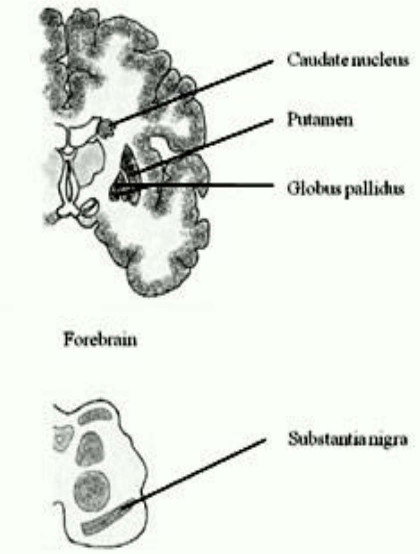

Figure 1: Components of the basal ganglia in the forebrain and the substantia nigra in the midbrain.Ref.[8]

B. Parkinson-plus Syndromes (PPS)

The Parkinson-plus Syndromes are the second most common group of PD after IPD. The syndromes encompass a group of idiopathic disorders that include Progressive Supranuclear Palsy (PSP), Multiple System Atrophy (MSA), dementia with Lewy bodies and corticobasal degeneration. Patients usually present with symptoms in addition to the classical signs of IPD. However, they are often misdiagnosed as having IPD in the early stages of the disease, when the distinguishing symptoms are not evident. PSP and MSA are the two common subgroups of the PPS.[5] [9]

- The neuropathology of Progressive Supranuclear Palsy (PSP) is generally more diffuse than in IPD, and involves additional components of the basal ganglia, other subcortical structures and occasionally the cortex. The globose (round) neurofibrillary tangles found in the subcortex are viewed as the pathological hallmark of PSP. As a result of the diffuse pathology, the additional clinical symptoms of PSP usually include: a down-gaze paresis that is viewed as the hallmark of the disease; severe gait disturbances; tremor to a lesser extent than IPD; and axial rigidity of the head and neck. Patients with PSP may also be more emotionally labile than those with IPD, and display sudden emotional outbursts such as crying or laughing inappropriately to the context. The symptoms of PSP generally present in patients around 60 to 70 years of age, and the prognosis is often worse than IPD, with motor and cognitive difficulties appearing earlier and declining more rapidly. Most patients become wheelchair bound within nine years after the initial presentation of symptoms and unfortunately, death soon follows.[10]
- Multiple System Atrophy (MSA) represents a number of disorders of similar neuropathology, with extensive neural loss or gliosis predominantly in the basal ganglia, other subcortical areas, and the cerebellum. The pathological hallmarks of MSA are glial cytoplasmic inclusions that stain positive with α-synuclein. As a result of the diverse pathology, MSA can present as different contributions of PD features, spasticity, cerebellar ataxia, and autonomic disturbances. The clinical symptoms of MSA typically appear in patients around 50 to 60 years of age. Cognitive difficulties may also present in around 22% of cases and typically as mild to moderate impairment. Similarly to PSP, the prognosis for MSA is worse than IPD, with faster deterioration, and death generally occurring around nine years after initial symptom presentation . The speech and voice difficulties associated with MSA are also typically more severe than those with IPD. Although hypokinetic dysarthria remains the predominant disorder, it can also be perceived in combination with ataxic and/or spastic dysarthria. Other reported speech and voice characteristics of MSA have included reduced vocal loudness, monopitch, imprecise articulation and respiratory stridor, particularly during sleep.[5] [11]

C. Effects of Parkinson's Disease on body's subsystem

The motor speech impairment associated with PD is known as Hypokinetic dysarthria. Hypokinetic dysarthria can manifest in any or all of the respiratory, phonatory, articulatory and resonatory subsystems of speech production, with the interplay of these subsystem impairments resulting in further disturbances in prosody and overall speech intelligibility.[14]

- At the respiratory level, some of the side effects that have been measured are: reduced vital capacity; lower rib cage volume than controls; irregular breath patterns; reduced strength and endurance of respiratory muscles; and asynchrony of speech and respiration with incoordination of chest wall movement during speech.[12] [13]
- Features of phonatory hypofunction are: reduced vocal fold adduction; bowing; glottal chink; laryngeal phase asymmetry; and tremor.[13]
- Impairments at the articulatory level have included reductions in: range; accuracy; strength; endurance of articulatory movements; as well as tremor in the orofacial muscles.[13] [14]

D. Speech therapy in Parkinson's Disease

The goal of rehabilitating the speech mechanism in dysarthric adults was to regain or obtain effective movements of the articulators used for speaking. However, this approach did not apply to individuals with paralysis agitans (PD) since it is a progressive and irreversible disease. Speech treatments on the patients like controlling intensity, improving articulatory mobility, improving articulation, had shown impressive improvements during the treatment session only to revert to the pathologic patterns. The therapeutic devices used for treating those with hypokinetic dysarthria include a voice amplifier, delayed auditory feedback (DAF), a wearable intensity biofeedback device, and a masking device. Voice amplification increases vocal loudness thus relieving any anxiety a person with PD may have if he or she was previously not audible to others. Another benefit of voice amplification was to increase self-monitoring of speech intensity. Intelligibility was not directly assessed, although the authors stated that intelligibility was improved. Instead of focusing on one aspect of speech production, the goal of the DAF device was to improve the patients' overall intelligibility. Two out of 11 subjects showed marked improvement in speech intelligibility. These two subjects demonstrated a "festinating speech difficulty". One of these patients continued to wear the DAF device for two years and still showed improved speech intelligibility. In a three-month study of two persons with PD, increases in relative vocal loudness and fundamental frequency as well as a marked reduction in speech rate were reported with use of the DAF device. In a case study, a microcomputer-based wearable biofeedback device was used to generalize a patient's vocal loudness outside the clinic. The device provided the person with PD with information about intensity that was usually only available during treatment in the clinic. Acoustic and perceptual analyses were performed on his voice pre- and post-treatment, showing generalization of clinic improvement to his daily life while wearing the device. This suggests that biofeedback, or behavioural modification, is effective in treating individuals with PD as long as the device is worn.[15]

The masking device has been used to improve persons with PD's vocal loudness. This device is based on a phenomenon known as the "Lombard effect," in which most individuals increase their vocal loudness when speaking in the presence of masking noise. A significant increase in vocal loudness was demonstrated in 10 out of 10 persons with PD under the masking condition compared to speaking without masking noise. There was no report of the results of a follow up evaluation or whether this vocal loudness level generalized outside of the clinical setting. These results further indicate that persons with PD can reflexively increase their vocal intensity but that under "normal" conditions, they cannot voluntarily control the "gain" in their volume. Today, many individuals with reduced vocal loudness resulting from PD seek speech therapy from a certified speech-language pathologist. It focuses on the voice itself (i.e., vocal loudness). One early report of successful speech therapy techniques targeted respiratory exercises. Three persons with PD were given several breathing exercises along with oral speech and non-speech exercises for 30 minutes three times per week. All three were subjectively said to improve in intelligibility but improvement was noted to be inconsistent over time. Prosodic exercises as well as their visual reinforcement via a Vocalite machine were initially used in the realm of speech therapy for persons with PD. Subjects significantly improved speech intelligibility and prosody for up to three months after treatment. The visual reinforcement device, however, appeared to only greatly benefit those with the most severe speech disorder. The long-term effects of intensive speech therapy focusing on prosody were also examined. Therapy targeted respiration, pitch variation, vocal loudness, articulation, strength and speed of the articulators, rate of speech, intonation and stress patterns, and communication intelligibility. Results revealed improvement in almost every aspect of speech (respiration, phonation, intelligibility, prosodic aspects of stress, intonation, and rate), as well as the ability to maintain these improvements following the intensive treatment. [15]

Three prosodic aspects of speech that were in a woman with Parkinsonian dysarthria included linguistic modulation of fundamental frequency, mean fundamental frequency, and rate of speech. The primary focus in speech therapy for individuals with hypokinetic dysarthria is vocal loudness. The most recent and efficacious therapy of this type is known as the Lee Silverman Voice Treatment (LSVT), which was developed by Ramig et al. (Ramig, Bonitati, Lemke, & Horii, 1994). The LSVT focuses on increasing both respiratory effort and vocal fold adduction. The combination of these entities is necessary in order to increase vocal loudness in individuals with PD. The five essential concepts of the LSVT include focusing on loudness, using increased effort, having an intensive treatment regimen, calibration, or knowing and accepting the amount of effort needed to increase vocal loudness consistently, and quantification, or measuring the patient's performance to increase motivation. Patients are given vocal loudness exercises such as maximum duration of sustained vowel phonation, maximum fundamental frequency range, and maximum functional speech loudness drill. The LSVT has been proven to be a successful long-term treatment and for large numbers of participants in increasing vocal loudness when compared to therapy targeting respiratory effort only. Not only does LSVT improve vocal loudness, but it also decreases the negative impact of PD on communication. The LSVT also has a positive impact on intelligibility, pitch variability, phonatory stability and vocal fold adduction. The participants in the LSVT studies were reported to be optimally medicated with dopamine replacement medications. [13]

E. Music Therapy Treatment for Parkinson's Disease

The music therapy has demonstrated good results for improving gait, cognitive function, communication, relief from arm/hand tremors, and emotional well-being. The music therapist will assess each individual to evaluate their strengths and needs, then provide the indicated treatment to strengthen physical, communication and emotional functioning. Treatment may include: Active Music Therapy, Music Executive Function Training, Music Attention Control Training, Rhythmic Speech Cuing, Oral Motor and Respiratory Exercises, Vocal Intonation Therapy, Therapeutic Singing, Rhythmic Auditory Stimulation, Therapeutic Instrumental Music Playing, Music-assisted Relaxation, Creative Movement to Music, and/or Song-writing. In treatment, the therapist actively involves the patient in listening to music, singing, playing instruments, moving with music, and composing music. The patient's preferred music (classical, popular, show tunes, country, rock, jazz, etc.) is used in sessions and no previous experience in music is necessary. Musical experiences are created to insure the success, even if the patient has never played an instrument before. Throughout the process, the music therapist partners with his patient to create a treatment plan designed to meet the patient's needs, and ongoing evaluation allows for adjustment towards treatment to maximize results for each patient. Consultations with other treatment team members, such as physical therapists, occupational therapists, and speech therapists may be included in team.[16]

V. TREATMENT OF CARDIOVASCULAR DISORDERS BY MUSIC THERAPY (MT)

The effect of music on the heart and blood pressure irregularities has been very effective. Earlier listening instruments include gramophone, and radio. The effects of music were influenced by how much the subjects appreciated listening music. Differing groups of musical competence responded in relation to volume, melody, rhythm, pitch and type of music. Interest in the music was an important factor influencing response. In general, listening to music was accompanied by a slight rise in blood pressure in the listener. If music produces physiological and psychological effects, in healthy persons as listeners then it may be assumed that persons with various diseases respond to music in specific ways. If some music is known to influence a physiological parameter such as heart rate or blood pressure, then that maybe music can be used therapeutically for patients who have problems with heart disease or hypertension. It is found that the human heart rate could be varied over a certain range by entrainment of the sinus rhythm with external auditory stimulus which presumably acted through the nervous control mechanisms, and resulted from a neural coupling into the cardiac centres of the brain. An audible click was played to the subject at a precise time in the cardiac cycle. When it came within a critical range then the heart rate could be increased or decreased up to 12% over a period of time up to 3 minutes. Fluctuations caused by breathing remained, but these tended to be less when the heart was entrained with the audible stimulus. An extension of this premise is that musical rhythm is a pacemaker, in terms of the effects of perceived rhythm on respiratory pattern, serving both metabolic and behavioural functions. Metabolic respiratory pathways are located in the reticular formation of the lower pons and medulla, whereas the behavioural respiratory pathways are located mainly in the limbic forebrain structures that lead to vocalization and complex behaviour. There appear to be both hypothalamic and spinal pattern generators capable of synchronizing this respiratory and locomotor activity. Therefore, if an external rhythmical musical activity, like as listening to taped music, would have an influence on respiratory pattern while keeping metabolic changes and afferent stimuli to a minimum (i.e. no gross motor movements). Respiratory data including respiration frequency and airflow volume was collected alongside heart rate and end-tidal CO_2. Subjects listened to a metronome set at 60b.p.m. and tapped to that beat on a microphone after a baseline period. There were no appreciable changes in heart rate during the experiment, but there was an appreciable change in respiratory frequency and a significant decrease in the coefficient of variation for all respiratory parameters during the finger tapping. For non-musically trained subjects there was little coordination between breathing and musical rhythm, while for trained musicians there was a coupling of breathing and rhythm. Auditory cues, then, appear to be important in the synchronization of respiration and other motor activity. It is this aspect of organization of behavioural events that appears to be the important aspect of music and central to music therapy. [2] [17]

VI. ROLE OF MUSIC IN CANCER THERAPY, PAIN MANAGEMENT

Cancer and chronic pain care require complex co-ordinated resources that are medical. psychological, social and communal. This treatment require palliative and supportive services that provide physical, psychological and spiritual care for dying persons and their families. Such a service is based upon an interdisciplinary team of health care professionals and volunteers, which often involves outpatient and inpatient care. In the Supportive Care Program of the Pain Service to the Neurology Department of Sloan –Kettering Cancer Centre, New York, a music therapist is part of that supportive team along with a psychiatrist, nurse clinician, neuro-oncologist, chaplain and social worker. Music therapy is used to promote relaxation, to reduce anxiety, to supplement other pain control methods and to enhance communication between patient and family. As depression is a common feature of the patients dealt within this program, then music therapy is hypothetically an influence on this parameter and in enhancing quality of life. The quality of life has assumed a position of importance in cancer care in recent years and music therapy, along with other art therapies, is thought to be important, the evidence for this belief is largely anecdotal and unstructured. Results discovered show a significant improvement in mood for the better when playing live music to cancer patients as opposed to playing taped music which she attributes to the human element being involved.[18]

A better researched phenomenon is the use of music in the control of chronic cancer pain, although such studies abdicate the human element of live performance in favor of taperecorded interventions. In addition to reducing pain, particularly in pain clinics, music as relaxation and distraction has been tried during chemotherapy to bring overall relief and to reduce nausea and vomiting. Using taped music and guided imagery in combination with pharmacological antiemetics, found that state anxiety was significantly reduced resulting in a perceived degree of reduced vomiting, although the nausea remained the same. As this study was not controlled, the reduced anxiety may have been a result of the natural fall in anxiety levels when chemotherapy treatment ended. However, the study showed that the subjects of the study felt relief which can be seen as an encouraging sign in the use of music therapy as a treatment modality.[19]

There is a rapid developments in this field related to management of paediatric pain, severe challenges of the

Human Immune- deficiency Virus etc. There is a pioneering work going on in this field so that therapists can use music therapy to treat all health problems easily.

VII. CONCLUSION

The purpose of this paper was to examine the treatment common body disorders by sound therapy. Treatment methods included speech therapy, pharmacologic, and surgical. This paper has studied the significance and reliability of the music therapy for Parkinson's disease (PD), cardiac diseases and in cancer treatment. Speech therapy appears to be the most effective method of treatment for improving voice and speech production in persons with PD. The research papers reviewed verified the success of the treatments in the practical environments. On analyzing majority of the parameters, the treatment outcomes for the participants were also statistically and clinically significant. Although some unique challenges might come across treatment of some special patients like children, patients with low hearing capability; but were made to adapt to this modality quickly, and a high level of participant satisfaction was achieved overall. The obscure observations in the realm of psychotherapy highlight a critical feature of music therapy research; well intentioned, and often rigorous work, is spoiled by a lack of research methodology. This is not to say that all music therapy clinical research should conform to a common methodology, or that it be medical research, rather that standard research tools and methods of clinical assessment be developed which can be replicated, which are appropriate to music therapy, and develop a link with other forms of clinical practice. Moreover, online treatment delivery in the 'real-world' remote setting at either the participant's home or within a community health centre could also be evolve as future prospective of this approach.

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