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SCIENCE OF RAGAS : THE CONTROL ON LIVING BEINGS TO THE COSMIC ELEMENTS

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ABSTRACT

Existence of all living beings on our planet has reasons to be or not to be. Beyond it also has a reason for non-living elements on our planet or cosmic elements in this universe, which we know or all unknown to our mind even though it is fact that every creation is living element. The harmony is governed by some media, though it is amongst the human beings, within animal or plant kingdoms or within various spheres exists on earth. We may assign it as a way of communication or interaction or integration but that medium is the force of transformation and modification of forms in the cosmos. Music as a complex and varied form of sounds has a mystic and eternal effect on human cyclic psyche and same as for all creations, but we may not percept. They too play with this form of energy, so as all kingdoms. The conception of the world to universe cannot be as exception that the sound dominate or influence on their subsistence. The essence of this piece of study lies in the strong influence of a harmonized and complex forms of sound as *Ragas* known in Indian music that effectively stimulate physical, physico-chemical and bio-chemical reactions through the medium of abstract form of human psyche and surrounding context. The *Ragas* as a perfect form of harmonized and rythmized group of naad, strongly related to perceptions of our minds. As speech and words are coded sounds that make suggestions and that controls all human beings and other living kingdoms too. *Ragas* could be eternal suggestions with no specific codes as universal harmony may not be codified but to percept. The total cosmos as a larger unit, believed to be formed with a big sound that enforce the elements to unite, disperse to transform or to make the complex elemental world that of ours. Each form of sound, element and compound has a special sound attached with, so as each human beings. Hence, a way of performing a harmonized complex group of sounds influence on abstract sphere of the human beings to the physical forms of energy exists in the entire universe. With years of experiments on various *ragas* and their strong influence on humans' psyche, the authors have construed that the sounds/ the *ragas* govern the human relations, controls over all the living, physical to abstract reactions and that of entire cosmos.

Key Words : Ragas, Human psyche, Cosmic reactions, Plant kingdom, Mystic

INTRODUCTION

It is known that the emotion and devotion are the essential characteristics of Indian music. Music in ancient India was regarded as means of divine contemplation and bliss. Today it is regarded mainly as a means of entertainment. It expresses our joys and feelings. When we are melancholy and sick, it reduces our sorrows and soothes our feelings. It has the capacity both of appeasing and intensifying different emotions.

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It has thus a great influence on the mind and heart of human beings. Before we understand the effects of various ragas on the living and non-living world, we must understand the essential elements of the music, the Naad – the sound is the root of the music, the speech, the communication and so the life. However, the meaning of naad must be unfolded to believe that it is the root of all. It is believed to be the heart of the process of creation. In Hinduism, the sacred syllable Om embodies the essence of the universe - it is the hum of the atoms and

the music of the spheres and sound in general represents the primal energy that holds the material world together. Etymologically, Na means breath and Da means fire or energy. Naad is thus a combination of breath and energy.¹ It implies that the sound produced by living beings emanates from the lungs and comes out from the mouth. There are two kinds of naad: *Ahat* and *Anahat/Anahad*. *Ahat naad* is a sound produced by the collision of two things or by physical manipulation. In both cases, vibrations produce the sound which dies away as the vibration come to an end. This is the sound with which we are concerned in music¹. *Anahad naad* is a self-producing sound, or what is called unstruck sound, as for example the music of the spheres due to the vibrations of ether in the upper regions.¹ It is also called subtle or *Sukshma naad*, which the yogis or highly spiritual personal hear within themselves when they get into a state of higher consciousness. Goswami² observes, The conception of *Naad* is connected with the *kundalini* or the spiral energy which when awakened starts from the *muldhara* (basic plexus) and reaches the crown of the head.² This solemn music is heard only by the spiritually-evolved.³ There are two tones of *naad*: *karkash* (harsh) and *madhur* (sweet). All musical sounds can be differentiated in three ways: a) By their magnitude, that loudness of intensity which depends on the energy used for their production, b) By the pitch depending on the number of vibrations per second : the greater the number of vibrations, the greater the pitch and c) By the quality or timbre, which depends on the nature of vibration and the reactive prominence of the upper partials of the instrument.⁴ *Naad* is related to *Dhvani* (a kind of sound). Music is concerned with sweet and pleasant *dhvani*. When a stringed instrument is played, vibrations are produced through the movement of the strings and these vibrations give the sound when they reach the human ears. These vibrations go in cycles and come back, again they go and come back and hence the sound continues till the stings come to rest. The unit for measurement of sound vibrations is one second. Vibrations (cycles) ranging from 96 to 1024 per second can be produced by Indian

vocal music, while the human ear is capable of picking up sound frequencies between 20 and 20,000 per second.

DISCUSSION

Raga : Description of Ragas and their meanings in Indian classical music

Indian music is based upon a system of *ragas* and is improvised or composed at the moment of performance.¹ The notes which are to convey certain definite emotions or ideas are selected with extreme care from the twenty-five intervals of the *sruti* scale and then grouped to form a *raga*, a mode or a melodic structure of a time. It is upon this basic structure that a musician or singer improvises according to his feeling at the time. Structural melody is the most fundamental characteristic of Indian music.⁵ Literally, *raga* means to colour or to please, basically *raga* is a scheme of melody. Matanga (5th century) defines it as a combination of notes, illustrated by melodic movements (*varna*), which is capable of producing pleasant sensations. It is a scientific, subtle, precise and aesthetic melodic form with its ascending and descending movement which consists of either a full octave or a series of five, six or seven notes.¹ It is an arrangement of intervals in a definite order upon which a melody is founded. A *raga* is the gamut of several notes woven into a composition which through aural perception softens the heart of the listener. It is really the melody mould, the outline of notes, the basic element of the composition, while the actual composition may differ according to the art of the musician. As the musician develops his discourse in his *raga*, it eventually colors all the thoughts and feelings of the listeners. Clearly, the longer a musician can dwell on and extend the theme with artistic intensity the greater the impact on the audience.

The *raga* in its development, layer by layer, with all its improvisations and refinements, reflects the degree of the proficiency of the performer. A *raga* is self-created out of a set pattern of notes and its delineation depends on the skills of the performer. There are two systems of scales in India. The South Indian or Karnatak music has 72 primary scales called *melas*, produced by variations of seven

fundamental notes (*shudh svaras*). The Hindustani music prevalent in North India has ten primary scales called *thaths*. A *thath* is a group of notes from which raga can be built. Each of the ten *thaths* has got a *raga* of the same name. There are seven basic notes which are called *shudh* (natural or pure). *Shruti* is microtone and is the smallest unit of measurement of a note which is clear and audible. It is defined as a note of minute pitch which the ear is capable of hearing. *Shruties* are distinct microtones in an octave. These microtones represent unequal intervals presenting definite expressive characteristics. The 22 *shruties* cannot be produced in succession by the throat, but can be demonstrated on a stringed instrument. There are 22 *shruties* out of which seven main notes have been formulated as *saptak*. The number of *shruties* in each note are as follows : S:4 *shruties* R:3, G:2, M:4, P:4, D:3 and N:2. According to the laws of physics, a sound creates a number of vibrations and frequencies which can be measured and the relation between two sounds (pitches) is the ratio between their vibrations. As such, S has 240 vibrations per second, R has 270, G-300, M-320, P-360, D-400 and N-450. Let's see some basic definitions of some of the words in Indian music.

Svara (Note): *Svara* is a note of definite pitch, which conveys an expression of charm and sweetness to the mind. *Shruti* is the measure and the *svara* is the thing measured. There are seven basic *svaras*. *Grama* (scale). This old word stands for a basic scale of notes. The fixation of 22 *shruties* in a scale among the seven *svaras* (*saptak*) is called *grama*. In the composition of a *raga*, certain notes are important and some are subsidiary.

Vadi svara / amsa (sonant) : Literally, it means the note which speaks. This is the most important or dominating note in a *raga*, which is a sort of key to the enfoldment of its characteristics. It is like the king of that *raga*. As it is the pivotal note, it is played very prominently or repeatedly. In it lies the particular *rasa* (emotion) of that *raga*. It also determines the time for the singing of the *raga*. *Vadi/Badi* is of two kinds: *poorvanga* and *uttarang*. *Poorvang vadi* means the lower

tetrachord, that is the first four notes S, R, G, M. The timing for *ragas* which use such notes is from noon to midnight. Take *Khamaj raga* its *vadi* is G and as such it is *poorvang* and hence sung up to midnight. *Uttarang vadi* means the next group of notes (the upper tetrachord) that is the four later notes P, D, N, S. The timing for *ragas* which use these notes is from midnight to noon. An example of *uttarang raga* is *Bhairav* whose *vadi* note is D. There are however some borderline *ragas* belonging to the time period of 4 to 7 a.m. and 4 to 7 p.m., which are called *sandhi Prakash ragas* which use R and D.

Samvadi svara (consonant): This is second important note in the *raga*, after the *vadi* note. Its position is at an interval of a fourth or fifth from the *vadi* note.

Anuvadi svaras (assonant): All the *svaras* in a *raga* except the *vadi* and *samvadi* are called *anuvadi*. They are like the servants who are subordinate to the *vadi* (king) and *smvadi* (minister) *svaras*. **Vivadi svaras (dissonant):** These are the dissonant notes which are not used in a *raga*, as for example P in *Gujri raga* or R in *Malkaus raga*. The use of *vivadi* notes disfigures the *raga*, and as such it is the enemy of the *raga*. The four above types of notes determine the structure and pattern of the *raga*. In fact the change of *vadi* in the same scale of notes may yield a different *raga*.

Varna (Melodic movement): A scale can be developed in *varna* or melodic movement. There are four types of such melodic movements: *Asthai*, (level) which means playing the same notes continuously; *Aroha*, the ascending motion of the notes in a *raga*; *Avaroha*, the descending motion of the notes; *Sanchari* (wandering) the melodic movement combining all the three types mentioned above.

Alaap : It is the unfolding of the essence and the pattern of a *raga* with a word like AA or RE or NA and with emphasis on the notes of *vadi* and *samvadi*. The singer, through the *alaap* displays the transcendent nature of both melody and rhythm.

Bandish : While *alaap* is the revelation of the *raga*, *bandish* is its design or display. Here the modes are explained in tune and words. *Bandish* is a composition (vocal or instrumental) fixed in a rhythmic pattern.

Rasa (emotion)

If raga (melodic pattern) be compared to a tree, *rasa* is its fruit. Just as the tree gives fruit, which provides juice, flavor, relish or delight and nutrition, in the same way *raga* provides all these things symbolically. As one musicologist puts it, Emotions is the food and the artistic consciousness is the tongue. The resulting experience is *rasa*.⁶ Those who practice the *raga* are able to give the appropriate *rasa* to the listeners. Just as the fruit produces the seed which later grows into another tree, in the same way, the *thath* (parent scale) can contribute to the creation of another *raga*. Undoubtedly, different types of music evoke different feelings and emotions. Certain sounds produce joy, others grief and yet others affection and tenderness. According to Indian aesthetics, each poem or musical composition produces a certain *rasa* (emotion). Literally, *rasa* means juice, but in musical context it implies more than an aesthetic relish—a transcendental experience. *Rasa* is essentially emotional reaction and awareness of it. The feeling may be pleasant or sad, high or low, sublime or ludicrous, actual or imaginary, furious or peaceful. Every *raga* or *ragini* is like a hero or heroine respectively in a certain emotional situation, and the musician or singer is expected to create that very situation to enable the audience to share it. By and large, each *raga* is supposed to evoke a single emotion. For example, the notes of *Khamaj raga* are said to evoke erotic feelings or to create a romantic mood. *Kafi raga* is tranquilizing and pleasing and gives a feeling of peace. In the system of Indian aesthetics, there are nine emotions called *nava rasa*. These are: *shingara* (romantic or erotic feeling), *hasya* (comic or humorous feeling), *karuna* (pathetic or sad emotion), *rudra* (anger or fury), *veer* (valorous or heroic), *bhayanak* (fear or terror), *vibhatsa* (odious or disgusting), *adhbhuta* (wonder or surprise) and *shanta* (peace and tranquility). American psychologists who made a scientific study of the effects of music found nine kinds of emotional changes in the listeners.⁷ Their feelings were similar to the nine *rasas*. These sentiments become more concretized in drama by the expressions of the eyes, lips, hands and words of the actor. In a musical performance,

the audience gets the particular emotion or mood of the *raga* through the notes and rhythm, the style of singing and graces, the vibrations of the scale and the feeling and ethos of the singer.

Timing of Ragas

Some of the *ragas* have been linked to the seasons. For example, *Basant* or *Bahar raga* - as the very name indicates as the very name indicates-belongs to the spring season. *Malhar raga* pertains to the rainy season. As mentioned earlier, by singing this *raga*, the singer can make the rain fall. Similarly, *Deepak raga* is so powerful that it produces a kind of fire within the singer which may even burn him. These stories cannot be brushed aside, because we know today that sound waves are a kind of energy. *Hindol raga*, the very name refers to the swing (*dol*), is cheerful and joyful as it is connected with the celebration of the birth of Lord Krishna. Classical musicologists have assigned a specific time to the performance of a *raga*. This has been based on the types of *svara* (notes) used in a particular *raga*. Certain *ragas* can be sung during the morning hours, some in the afternoon, some in the evening and some late at night. This theory is based on the suitability of notes to the periods of singing. This may be given as under: a) *Ragas* of the period 3 a.m. to 6 a.m. use *Re* and *Dha*. b) *Ragas* of the period 6 a.m. to 9 a.m. use *Re*, *Ga*, *Dha*. c) *Ragas* of the period 9 a.m. to 12 noon use *Ga* and *Ni*. d) *Ragas* of the period 12 noon to 3 p.m. use *Ga* and *Ni*. e) *Ragas* of the period 3 p.m. to 6 p.m. use *Re* and *Dha*. f) *Ragas* of the period 6 p.m. to 9 a.m. use *Re*, *Ga*, *Dha*. g) *Ragas* of the period 9 a.m. to 12 midnight use *Ga* and *Ni*. h) *Ragas* of the period 12 midnight to 3 a.m. use *Ga* and *Ni*.

Influence of ragas on human beings through energy circles**Chakra in our body**

Chakra is a Sanskrit word literally meaning wheel. These centers were named as such because of the circular shape to the spinning energy centers which exist in our subtle etheric body – the non-material energetic counterpart to our physical body. There are seven main chakras and they are located along the spine extending out the front and

back of the body. Each *chakra* has a number of specific qualities that correspond to the refinement of energy from the base-level material-self identity, located at the first chakras, up to the higher vibration spirit-level awareness of being at our crown. These energetic centers represent our highest level of integration split, prism like into a spectrum of colors (**Fig. 1**). The *chakras* are formed at the junction of three connected energy shafts that ascend the spine, one on each side of the central channel, the *Shushumna*. The two lesser channels of energy– the *Pingala* on the right and *Ida* on the left – run parallel to the spinal cord. *Chakras* both take up and collect *prana* (life force energy) and transform and pass on energy. Our material bodies could not exist without them for they serve as gateways for the flow of energy and life into our physical bodies. Each *chakra* is associated with a certain part of the body and a certain organ which it provides with the energy it needs to function. Additionally, just as every organ in the human body has its equivalent on the mental and spiritual level, so too every *chakra* corresponds to a specific aspect of human behavior and

development. Our circular spirals of energy differ in size and activity from person to person. They vibrate at different levels relative to the awareness of the individual and their ability to integrate the characteristics of each into their life. The lower *chakras* are associated with fundamental emotions and needs, for the energy here vibrates at a lower frequency and is therefore denser in nature. The finer energies of the upper chakras correspond to our higher mental and spiritual aspirations and faculties. The openness and flow of energy through our *chakras* determines our state of health and balance. Knowledge of our more subtle energy system empowers us to maintain balance and harmony on the physical, mental and spiritual level. Meditation, yoga systems and specific frequency treatment by specific *ragas* seek to balance out the energy of the *chakras* by purifying the lower energies and guiding them upwards. Through the use of grounding, creating internal space and living consciously with an awareness of how we acquire and spend our energy we become capable of balancing our life force with our mental, physical and spiritual selves .⁸

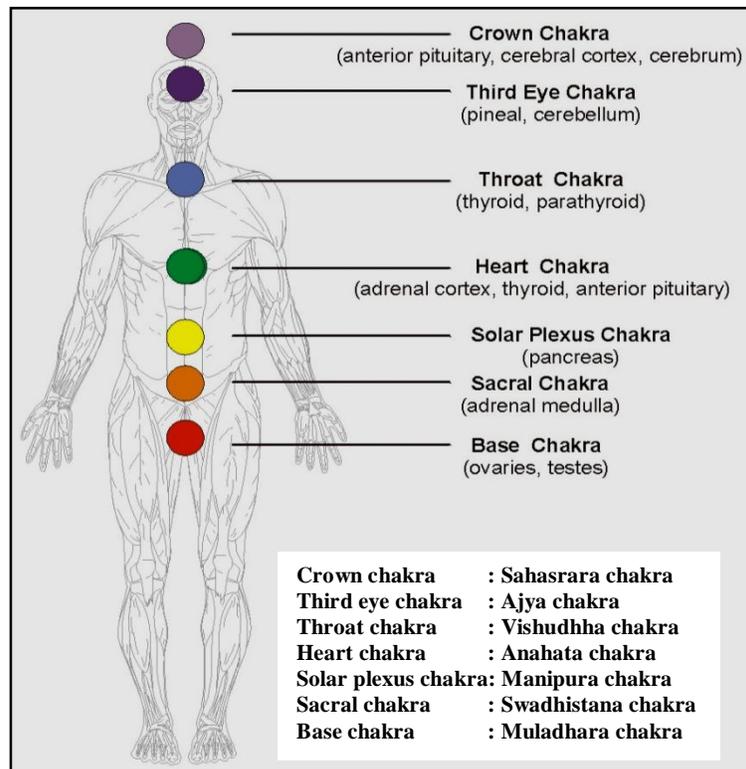


Fig. 1 : The *chakras* in human body relates various organs and diseases

In order for us to become fully self-realized and in harmony with our physical and spiritual nature our denser lower energies need to be harmonized with the lighter energies of the upper centers. This is to say our survival and base tendencies have to be raised to incorporate a heart-felt spiritual focus expressed in all areas of our being. Indeed, each of the upper-level energies corresponds and refines a lower level counterpart: 7th with 1st, 6th with 2nd, 5th with 3rd. In the center of our being is full integration into the heart. Each center has an integral function in creating our energetic balance. It is through the study of our energetic and physical being that we can create health, emotional stability and spiritual bliss.

Chakras : relations with human physiological and energy processes

Ancient cultures understood intuitively what scientific research and practitioners worldwide are confirming today about the flow of energy in the body and, how the use of energy therapies can enhance the healing process. As well known medical surveys report approximately 50% of the American public using some form of complementary or alternative therapy, energy work is among the ten most frequently used. Research has shown that these therapies (often called mind-body-spirit techniques) can help decrease anxiety, diminish pain, strengthen the immune system and accelerate healing, whether by simply inducing the relaxation response (and reversing the stress response and subsequent impacts on the body, illness and disease).⁹ Another form of healing the Reiki is a Japanese hands-on technique for stress reduction and relaxation that also promotes healing. It is based on the concept that everything in the universe is made up of energy and this life force energy that flows all around us is drawn in by the body nourishing the cells, organs and glands. This same energy also radiates from the body and is called the human energy field. When one's energy is depleted, imbalanced or the flow is restricted by stress and holding, injury, illness, etc. one is more susceptible to discomfort, further illness and disease. When one's energy is restored, free-flowing or balanced, one is more likely to feel relaxed and the body's own innate healing abilities are jump-started and

utilized for healing. According to research done as early as 1930 by Dr. Harold Burr from Yale, disease (imbalances) can be detected in the energy field before symptoms and can be altered by altering the vibrational frequency of the energy field. This was not well accepted at that time but is becoming more widely recognized.⁹

Charging chakras through music

The human energy fields such as *chakras* can be charged possibly through specific sound or a group of sound, as each energy flower has been assigned by a unique sound, the similar sounds can charge it by attaining resonance between the vibrations of the musical notes being sung and the vibrations of the specific *chakra*. For this purpose a form of composite sounds is known as *mantra* is used in various ways, it is written in the ancient Vedic literature that mantras can vibrate the *chakras* of our body. This group of *dhvani* or *spandan* – vibration can be concise to one single *varna* or sound – characteristics of its own. Recharging and vibrating the *chakras* using certain syllable is the power of *mantra* in our body, therefore *mantra* is said to be a powerful tool to change the mental and physical states of our body.¹⁰

Universal harmony, human evolution and sound

Everything in our world is a waveform (sometimes called pattern or sine-wave signature) or could even be seen as sound. All things our bodies, planets, absolutely everything are waveforms. The dimensional levels are nothing but differing base-rate wavelengths. The only difference between this dimension and any other is the length of its basic waveform.¹¹ This universe – all the stars and atoms going infinitely out and infinitely in forever has a base wavelength of about 7.23 centimeters. In a spiritual sense this 7.23-cm wavelength is Om, the Hindu sound of the universe.¹¹ Every object in this universe produces a sound according to its construction. Each object makes a unique sound. If one averages the sounds of all the objects in this universe, this third dimension, one would get this 7.23-cm wavelength and it would be the true sound of Om for this dimension. This wavelength is also the exact average distance

between our eyes. It's also the exact average distance from the tip of our chins to the tip of our noses, the distance across our palms and the distance between our chakras. This 7.23-cm length is located throughout our bodies in various ways because we are emerged within this particular universe and it is embedded within us. It was Bell Laboratories that discovered this wavelength. They tried to find the static, looked through their equipment and tried everything they could. First they thought it was coming from inside the Earth. Eventually they looked into the space and found that it is coming from everywhere. They upped the power 50,000 times over what they would normally need, which created a very powerful field, so that the 7.23 cm wavelength coming from everywhere would not interfere. For reasons such as the above, it is believed that 7.23 centimeters is the wavelength of our universe¹². What does this mean? Let's use music as an example. Music can come into human experience as sound and be heard and felt inside us or it can be understood by the left brain as proportion and mathematics. As one studies sacred geometry, one should remember that both sides of the brain use the same information differently. Musical notes and intervals were carefully and mathematically calculated and the Pythagorean Law was known many centuries before Pythagoras propounded it. They were aware of the mathematical law of music.¹³ Unified over 2,500 years ago by pythagoras in a philosophy known as *musica universalis*, ancient civilizations found order and a noble purpose in harmonic science.¹⁴ To understand the harmony of nature let us take the radius of the circle to be 2π and then align one full cycle of a harmonic standing wave with the navel, the fifth harmonic (a 3:2 proportion) can be found to match the curvature of the human spine - exactly. More amazing than this, the location and spacing of the seven tones of a musical major scale align with the seven Hindu chakra locations in the body. Even the traditional chakra colors align to these locations when the perineum (at the bottom of the torso) is assigned red at the bottom of the visible light spectrum. Obviously, someone understood harmonic interference patterns and

their presence in the body a long time ago. Another example of harmonic evolution of human organs through time is our ears. As sound propagates into the Basilar membrane of the ear's spiraling cochlea, thousands of tiny hairs provide even more filtering by bending around the gaps that harmonics create. When you consider physiology as a prerequisite for cognition, the spiraling anatomy of the human ear evolved to reduce noise while enhancing recognition of harmonics. This must be why we can enjoy and respond emotionally to music. Simple music harmonies fit the coherent structure of our body like a glove. The spectral pattern is not limited to sound only, but exists everywhere harmonics form, including electromagnetic fields, laser light, musical tones, natural vibrations in the earth, the spacing and sizes of planets in our solar system and the coherent cellular structures of life. We can represent it mathematically using a statistical curve called a first-derivative Gaussian distribution.

Previous works on music and its effects on humans

Music therapy : Experimentations by others

Musical notes and their vibrations the certain frequencies as a form of energy waves affect the human energy field the aura and ethrics made up of seven major chakras and an energy field around. As each chakra represents certain moods and ailments in the body i.e. biochemical processes, the chakra which is disrupted or deceased should be restored or repaired through recharging them with several treatments like Reiki, *Pranayam*, *yoga* and music. Music is used as an alternative therapy all over the world. Psychologists might consider conducting groups with music therapists serving as co-therapists, with the music therapist using the nonverbal qualities of music and the structure and pleasurable aspects of this type of therapy to facilitate interaction and the psychologist using this interaction and setting to address common goals. Introducing music, a structured but emotionally expressive medium, into the acute rehabilitation treatment setting would allow rehabilitation psychologists access to a cost-effective, pleasant and entertaining adjunct to traditional psychotherapy.¹⁵

Music and its effects on an unborn baby

Sound therapy or stimulation with the help of certain sounds, has been reported as an effective way to instill calmness in the developing fetus. Not only this, certain sounds have been reported to have had positive effects on the growth of the fetus as well. Wondering what kind of sound(s) will prove to be the most effective? Well, the answer is to include more of mild, soothing music as opposed to loud blasting music. In short, let your unborn baby listens to notes of classical music and similar soft sounds. Also, remember to let your baby hear your own voice often. This way you will initiate a bond with your baby even before it is born. The sense of hearing begins to develop when fetus is 3 weeks old, by the time it is around six months old, not only is it able to listen to music but also distinguish between the different types of music. We have countless examples where music has had a positive effect on the intelligence, creativity, mathematical ability and reasoning in children of all ages, so, why not unborn babies? Once you decide to play music for your unborn baby, you should be careful about choosing the method of doing the same, so that the volume is not too loud for the baby. According to experts, is to keep the decibel level below 70 and never more than that. Doctors have discovered that when a fetus is listening to music, its breathing cycle gets tuned to the music played and it is able to relate to the music after birth, when listening to the same tunes can bring about a sense of familiarity and soothe the baby.¹⁶

Effect of music on heart rate

Listening to very loud music makes our heartbeat so fast that we can actually feel the heavy beating. In that case, we become anxious and restless. This is because of the effect of loud music on your heart rate. Loud and faster music increases the heart rate, hence we have a feeling of high anxiety, hyperactivity, stress, etc. On the contrary, slower music or music that has a slower tempo is associated with a slower heart rate. People who listen to calming music or classical music have a slower heart rate as compared to those listening to fast paced music or those not listening to music at all. The music and heart rate experiment found that the effect of music

on the heart is based on the functioning of the brain. When we hear music, the sound waves produced are translated into electrical impulses by the brain. These impulses are sent to the hypothalamus. Listening to any type of music you like can be helpful, rather than not listening to any music at all. It is believed that people who have a slower heart rate have a longer life. Similarly, people having a higher heart rate are at a greater risk of suffering from cardiovascular diseases. When music slows down the heart rate, it brings about a feeling of calmness and hence, it is used as a relaxation technique. Music also helps in bringing about an overall feeling of wellness, besides it also helps in reducing stress and relieving anxiety. Music speaks what cannot be expressed, soothes the mind and gives it rest, heals the heart and makes it whole.

Music and some psychosomatic disorders

Music seemed to be of clinical usefulness for certain core domains of autism but a randomized controlled trial of long-term music therapy in autism is warranted.¹⁷ Music is a safe, inexpensive, easy-to-use intervention that can be used by nurses to reduce pain and episodes of acute confusion and improve recovery in older adults after hip and knee surgery. Nurses can use music as an intervention to promote the establishment of a healing environment for older adults after hip or knee surgery.¹⁸ Number of studies demonstrated that music listening activates a multitude of brain structures involved in cognitive, sensorimotor and emotional processing. For example, music engages sensory processes, attention, memory-related processes, perception-action mediation (mirror neuron system activity), multisensory integration, activity changes in core areas of emotional processing, processing of musical syntax and musical meaning and social cognition. It is likely that the engagement of these processes by music can have beneficial effects on the psychological and physiological health of individuals, although the mechanisms underlying such effects are currently not well understood.¹⁹⁻²¹

Music and physics

In 1967 Swedish doctor Hans Jenny wrote a book named structure and dynamics of waves

and vibrations. He proved through his machine (tonoscope) that the sounds can be converted to figures and that the words and sounds can be seen physically. He could prove that through the vibrations anti-gravity can be established. He also established that the biological evolution is the result of sound waves and that the cinematic pictures and quantum particles are similar. The entire solid state world is the product of vibrations only. Hans Jenny also says that body sound of each individual is different as known as the natural vibration. Fabian Mamen a bioenergist and Helen Grimlay experimented music on a lady suffering from breast cancer, within a few days her cancerous lumps vanished. In the case the sound vibration is impacted on the cytoplasmic and nuclear membrane. Modern medical science says that most of the diseases are psychosomatic. They originated when mental states and emotions are curbed down.

Some experiments by the authors

An experiment by the authors in Kachchh is in progress wherein a pregnant woman is under the constant supervision of Kajal Chhaya since the inception of the fetus, KC used to sing several ragas, especially on 5th month *malkaunsh*, at 6th month *puria dhanashri* and at 9th month she applied *bhairavi*, the results are awaited in a few days what is being expected on this experiments. The results we expect to get for the development of the baby to be sharp with logical and analytical mind with unusual memory power. In a recent experiment at a remote country place in Kachchh wherein a temple of Shiva at a high ground, during the month of July, the authors have experimented for the effects of *raga* on the non-living things – the environments several morning and noon ragas were sung and at last the *raga megh malhar* introduced to the gathering and it started raining as thundering shower. The tunings and the positivity of all listeners were mesmerizing and KC spent all her energy into it. The concert in the nature started with morning raga *Bhairav*, followed by *Hans Dhvani* and at the end the *megh malhar*. This could be the effect of the sound energy waves on nature. The authors have performed several experiments using various ragas and their healing powers especially

mental ailments like anxiety, depression and lack of confidence at youth to elder stage. A consistent sitting for an hour in the morning and an hour in the evening, listening only a specific *raga* related to the persons nature and nature of the *raga* removes all mental stress, anxiety from the object. The performer when performs *riyaz* he/ she is not under the control of the own senses, but as if govern by somebody and has a great feeling of joy and peace which any of the yogi gets after the *yog sadhana*. Such experiences by the author KC for herself ignite her to play on individual *swara* and have a temptation to move on it. The perception of her *sadhana* is like the perception of yoga as if she possesses a giant body by herself and can see the people as a small toy that she can communicate with music, but at the other time she may become a tiniest organism and can move anywhere she wish in anybody's body. Such experiences suggest the connection of the musical notes with various *chakras* and thereby with the cosmic energy.

The Joint National Committee, USA in its 7th report indicates that there is a definite connection between music and academic achievement. The music that makes the foot tap, the fingers snap and the pulse quicken stirs the brain at its most fundamental levels, suggesting that scientists one day may be able to return damaged minds by exploiting rhythm, harmony and melody, according to new research. Exploring the neurobiology of music, researchers discovered direct evidence that music stimulates specific regions of the brain responsible for memory, motor control, timing and language. For the first time, researchers also have located specific areas of mental activity linked to emotional responses to music. The latest findings, presented at a meeting of the Society for Neuroscience in Los Angeles, underscore how music as an almost universal language of mood, emotion and desire, or chestrates a wide variety of neural systems to cast its evocative spell. Overall, music seems to involve the brain at almost every level. Even allowing for cultural differences in musical tastes, the researchers found evidence of music's remarkable power to affect neural activity no matter where they

look in the brain, from primitive regions in all animals to more recently evolved regions thought to be distinctively human. Music exists in every culture and infants have excellent musical abilities that cannot be explained by learning. Mothers everywhere sing to their infants because babies understand it. Music seems to be part of our biological heritage from enhancing concentration and memory to dealing with diabetics as well as boosting ones immunity, music therapy lends its healing touch. The passive form of music therapy, (listening) has a beneficial effect in almost all ailments whereas the active form, (participating) is especially helpful for neuro- logical problems. Music integrates mind, body and spirit and provides opportunities for self-expression. Dr. Nishindra Kinjalk lists some ailments and the corresponding ragas which may benefit patients: Depression : Komal Rishabh Asawari and Shankara, Anxiety : Nat Bhairav and Sohni; Parkinson's : Bhatiyar and Yamen, Acidity : Bairagi and Bhoopali, Hypertension and Heart Problem : Todi and Pooriya Kalyan, Labour pains : Jaunpuri, Hameer and Abhogi, Stroke : Ramkali and Gorakh Kalyan, Asthma : Nilambari, Megh and Bharavi. Therefore it is established the sound and raga in particular has a great importance in human life, they charge the human energy fields using a specific mantra which is skilled composition of various sounds. In addition, there are experiments by Hans Jenny wherein he proved that any sound or vibration especially the Sanskrit and Hebrew vowels when chanted against the sands the same letter assigned to it is came out, e.g. when ohm was chanted, first O formed and when M being chanted with tonoscope, square and triangle occurred and ultimately ॐ figure came out. This proved that the sound has shapes too. The experimentations and experiences on human energy cycles – chakras also proves the color of the sounds.

CONCLUSION

From the studies of ancient texts, Vedas, scriptures their interpretations and through the experimentation and experience of hundreds of programs by the authors depict that the elite form of Indian classical music, the raga influence the human mind and also the physical

processes and organs through the resonating sounds by specific frequencies allied to the particular human energy circles – chakras. The chakras having been known as energy flowers and connecting centers to the outer world as the nodes of communications can be oscillated through specific sound frequencies. Their disorders can be restored by listening and performing the ragas, as the music treatment. The solid form, the material is a transformation from the wave form of energy i.e. sound. Therefore elite form of it has a connecting power from the body to the universal energy and that is possible by the music. The harmony in the physical world from the oscillating atom to the living organism to the universe is synchronous with the harmony of sounds and group of sounds and that they are congruent with the forms, colors and universal geometry. Hence the raga we play through the skilled throat chakra is connected with all other chakras of human energy field.

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