

MUSIC THERAPY FOR PCOS BASED ON THE BIORHYTHM PRINCIPLE OF *ĀYURVEDA*

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Abstract

Music therapy is using music and musical elements for educating and healing people emotionally. Music therapy along with lifestyle modification as prescribed by *Āyurveda* following *Dinacarya* (the rhythm of the sun) and *Sadvritta* (personal and social code of conduct), plays an essential role in treating disease.

In this article, we discuss music and its elements in combination with Yogic practices of *Āsanās* (Yoga postures), *Prāṇāyāmās* (breathing exercises), and *Kriyās* (cleansing exercises) which has shown clinically significant changes in polycystic ovarian syndrome patients. *Āyurveda* is more than a physical medical system that states one's health is determined by the unaffected stable state of biological humor (*Doṣās*) i.e., *Vāta*, *Pitta* and *Kapha* which corresponds to air, fire and water elements in the body. An imbalance in these elements causes illness. As a part of Indian music therapy, we have attempted to provide a list of *Rāgās* (Indian melodies) with a particular aesthetic mood based on the biorhythm principle, which helps to balance the *Kapha Doṣa* that give rise to Polycystic Ovarian Syndrome (PCOS).

Keywords: PCOS, Music Therapy, Yoga, *Ayurveda*.

INTRODUCTION

According to WHO (World Health Organization) “Health is a condition of overall physical, mental, and social well-being, not only the absence of disease or infirmity” (Hagihara, 2015).

In the context of *Āyurveda*, the term *Swasthya* means health (Hagihara, 2015), which is to be established in one's natural state (Verotta, Macchi, 2015). It is defined as a state where the physical body, senses, and psyche are at their most natural or original state in terms of body and function (Lakshmi C. Mishra, 2003). *Suśruta* explains in the chapter on *Suśruta Saṁhitā* that a healthy state constitutes of balanced humor, balanced enzymes, and metabolites, balanced tissue system, state of excretory functions along with ecstasy, soul, sense organs, and mind functioning properly (Atrideva, 2007). The five basic elements (aether, air, fire, water, and earth) appear in the human body as the *Tridoṣa* (*Vāta*, *Pitta*, and *Kapha*), which are three primary principles or humors. *Vāta Doṣa* reflects the speed and mobility of space and air, *Pitta Doṣa* reflects the metabolic properties of fire, and *Kapha Doṣa* reflects the stability and solidity of water and earth (Choi, 2010). As long as the *Tridoṣa* are in an undisturbed steady state, the body is healthy, and sickness is caused by their imbalance (Kumar, 1992). Environmental influences, daily routines, seasonal

changes, lifestyle, nutrition, regular exercise, and bodily tonics (*Rasāyana*) are all highlighted in *Āyurveda* as important aspects in preserving health. It also underlines the importance of balancing all bodily and sensory needs, as this leads to sickness (Lakshmi Chandra Mishra, 2004). PCOS is one such condition that is characterized by a disruption in *Doṣās* (Sawant et al., 2017).

PCOS (POLYCYSTIC OVARIAN SYNDROME)

Polycystic ovarian syndrome/disease is a metabolic and endocrine ailment (D. Mishra & Sinha, 2008) and is a common gynaecological disorder (Zafar et al., 2019) affecting 5% to 12% of women and lead to changed appearance of affected individuals. PCOS is characterized by irregular menstrual periods due to polycystic ovaries (Månsson et al., 2011). During the process of ovulation in a normal menstrual cycle, one or more eggs are released. PCOS causes failure of egg maturation and discharge from the ovaries, resulting in a tiny cysts (Shanthi & Perumal, 2014) leading to called polycystic ovarian syndrome (Shama, 2017). Women affected with PCOS don't have regular cycles and show increased testosterone levels (Shanthi & Perumal, 2014), infertility and other hormonal imbalances (Konar, 2016). PCOS, the most prevalent endocrine disease impacting female fertility (Schmid et al., 2004) is also referred to as Stein-Leventhal Syndrome (Soni, 2017), ovarian hyperthecosis, sclerocystic ovary syndrome, and Polycystic ovarian disease (Sawant et al., 2017). The term "syndrome" is used because it is a complicated condition including obesity, insulin resistance, irregular and mostly excessive menstrual bleeding, delayed menstrual periods, lack of ovum formation, and so on. PCOS is a source of significant concern because it is widely observed in women of reproductive age. Sometimes women affected by PCOS are further distressed with the stigma of 'Infertility Queen' (Stein & Leventhal, 1935).

PCOS IN ĀYURVEDA

The ancient discipline of *Āyurveda* addresses a variety of women ailments, including polycystic ovarian syndrome (D. Mishra & Sinha, 2008). PCOS is associated with *Ārthava Kshaya* in *Āyurveda*. It is considered a state in which a vitiated *Kapha* performs *Āvarana* (covering) on *Vāta*, blocking the passage or channels conveying *Ārtava*, resulting in *Ārtavanasha* (anovulation), and obstructing the *Ārtavapravritti* (menstruation) (Bhadre et al., 2018). It has been described as *Ārtava* deficit or loss, vaginal discomfort, *Ārtava* that does not appear on time or is delayed, scanty, and does not persist more than three days (Dayani Siriwardene et al., 2010). Since it is not classified as a separate illness, it is categorized as *Yoni Vyapadās* (utero-vaginal disorders) (Shama, 2017) and *Ārtavadushti* (*impurities in menstrual blood*) (Sarjerao Satpute et al., 2020).

ETIOLOGY OF PCOS

The origin of PCOS has been traced to a variety of risk factors e.g., lifestyle choices, chemical exposure (Patel, 2018), hormonal imbalance, contraceptive pills (Sawant et al., 2017), diet (Moran et al., 2010), environmental factors, and viral mediators. Further, there are hereditary variables that contribute to PCOS etiology (Ajmal et al., 2019). The symptoms start early in life in the mother's womb and continues throughout one's life, eventually leading to PCOS (Kshetrimayum et al., 2019). It is more prevalent among family members than in the general population, affecting 20–40% of first-degree female relatives of women with PCOS (Goodarzi et al., 2011). Stress causes an increase in insulin levels (Steeegers-Theunissen et al., 2020) disrupting ovary's functioning and contributing to the development of PCOS (Ajmal et al., 2019).

CAUSES OF PCOS IN ĀYURVEDA

The balanced state of *Doṣās* is primarily responsible for health in *Āyurveda*, and any deviation from this results in illness (Shama, 2017). PCOS is classified as a *Kapha* disorder/*Doṣa* in *Āyurveda*, with *Kapha* obstructing *Vāta* and *Pitta* (Sawant et al., 2017). The *Āhara* factor (diet), *Vihāra* factor (day sleep and overnight work, lack of meditation and exercise) and *Mānasic* factor (sedentary lifestyle and psychological factor) play significant roles in the manifestation of PCOS. These factors cause *Vāta-Kapha Doṣās* to be vitiated and changed into *Vāta-Kapha Ārtavadushti* (Anjali Verma, 2015). *Āyurveda* states that the cause of PCOS is intake of excessively sweet and *Kaphagenic* foods, due to which *Kapha* becomes aggravated (Mohite et al., 2020) resulting in the formation of cysts in the ovary (Shanthi & Perumal, 2014) and affecting the digestive 'fire' in the stomach (Skudder, 2014). This condition may also be caused aggravated by *Prajñāparādha* (ignorance) and lack of love (D. Mishra & Sinha, 2008).

HOW DOES IT AFFECT THE QUALITY OF LIFE?

PCOS-related issues such as infertility, subfertility, hirsutism, and oligo/amenorrhea can have a substantial impact on a woman's quality of life and body image (Angin et al., 2019). Insulin resistance and accompanying metabolic problems are common in PCOS-affected women (McCartney & Marshall, 2016). By the age of 30, about 20% of women with PCOS develop non-insulin-dependent diabetes (NIDDM). Women who are diagnosed with PCOS before becoming pregnant have a higher risk of developing gestational diabetes (Ashrafi et al., 2014) and infertility (Tarlantzis et al., 2008). PCOS can result in mental and psychological disorders thereby affecting one's sexual, child birth and well-being (Direkvand-Moghadam et al., 2015). Melatonin, a well-known circadian rhythm regulator, levels have been found to rise at night in

PCOS women with poor sleep, mood disorders and quality of life (Sam & Ehrmann, 2019).

WHAT IS MUSIC?

Music is described as "the art or science of arranging sounds in notes and rhythms to provide a desired pattern or effect," or "the art or science of blending sounds of voices or instruments to produce beauty of form and emotions" (Cross & Morley, 2008), (Murrock & Higgins, 2009). Human beings' closest art form for expression is music. It's evolution may be traced back to ancient times shaped by several cultural processes (Patwardhan-Pujare, 2002).

Indian classical music has a long history. It is traditionally thought to have originated in *Sāmaveda* (Chandrasekaran et al., 2005). Music in *Saṅgīta Ratnākara* is "*Gītam Vādyam tadā Nr̥tyam trayam Saṅgītamucyate*" which translates to "dancing is directed by instrumental music, which in turn follows the vocal music" (Sarngadeva, 2007). Indian classical music has been divided into two branches over time: Hindustani and Carnatic. Even though the two systems appear to be almost independent of one another now, both owe their origins to seven notes or *Sāmaveda's Saptaswara* (Chandrasekaran et al., 2005).

MUSIC THERAPY AND ITS ELEMENTS

Music therapy can be used as a preventive measure as well as an add-on therapy to the main treatment after the pathological condition has manifested. The right kind of music, with the right tonal quality, played at the right moment, has been found to help to alleviate loneliness and generate a feeling of peace and well-being (Sharma, 1996).

Rāga Chikitsa is an old text (Sarkar & Biswas, 2015) that discusses with curative *Rāgās* and proposes certain *Rāgās* with therapeutic and mood-enhancing characteristics for use in clinical settings (Sundar, 2007). *Rāgās* are employed in conjunction with *Āyurveda*, the ancient vedic healing science. A *Rāga* must be played or sung to a patient while keeping in mind his or her physical nature of *Vāta*, *Pitta*, or *Kapha* (Sarkar & Biswas, 2015).

Indian Classical Music's fundamental ingredients or technical subdivisions are *Nāda* (sound), *Śruti* (musical interval), *Svara* (note), *Rāga* (melody), *Tāla* (beat), *Rasa* (aesthetic mood), and *Thāt* (mode) (Sarngadeva, 2007).

A sound having a continuous quality with a single frequency or a set of related frequencies is referred to as *Nāda* (Nagarajan, 2021). *Śruti* is a pitch position as well as a "musical interval" that makes up the notes of the octave (Deva, 1973). In Carnatic music, a note is referred to as a *Svara* (Sridhar & Geetha, 2009). The seven

notes of the Indian musical scale are *Sa, Ri, Ga, Ma, Pa, Dha, and Ni* (Chaitanya, 1992). Each note or *Svara* that is either lowered or raised in pitch is termed as *Kōmal* and *Tīvra Svara* respectively (Prajnananda, 1973). *Rāga* is a series of selected notes (*Svara*) that, when combined, create a proper *rasa* or aesthetic mood (Prasad, 1994). The tempo of the music and the placement of syllables in the composition is indicated by *Tāla* (Sridhar & Geetha, 2009). When an emotion is aroused in such a way that it loses all cognitive tendencies and is experienced in an impersonal meditative mood, it is known as *Rasa* or aesthetic mood. A specific array of the seven notes with a variation in *Śuddha* (pure), *Kōmal* (flat), and *Tīvra* (sharp) is known as *Thāt* or mode (Nagarajan et al., 2015).

EFFECTS OF *YOGA* PRACTICE ON PCOS OUTCOMES FROM EARLIER STUDIES

It has been reported that practicing *Kāyakaḷpa Yoga*, which combines *Āsvini Mudrā* (contraction and relaxation of the pelvic diaphragmatic muscles), *Mūla Bandha* (persistent contraction of the anal sphincter including the pelvic floor), and *Ojus Breathing* (inspiration and expiration with *Mūla Bandha*), helps reduce body weight, control abnormal cholesterol levels, manage regular menstruation, endocrine glands and nerve plexus, leading to PCOS management (Shanthi & Perumal, 2014). Reduced cardiovascular morbidity in PCOS women by the practice *Āsanās, Prāṇāyāmās, and Kriyās* (*Agnīsār Kriyā* and *Kapālabhāti*) has also been reported (Anushka Verma et al., 2019). Another study found that *Āsanās, Prāṇāyāmās, and Kriyās* helps with weight loss and stress management, thereby managing PCOS more efficiently (Anjali Verma, 2015). Another study on *Yoga* has been shown to reduce anxiety symptoms in adolescent females with PCOS (Ram et al., 2012). *Yoga* has been found to be a meditative exercise improving the quality of life of women with PCOS undergoing infertility treatment. (Bahrami et al., 2019). *Yoga* has also been found to improve glucose, lipid, and insulin readings, including insulin resistance readings, in adolescent girls with PCOS (Nidhi et al., 2012). PCOS patients reported lowered blood pressure and heart rate in people practicing *Yoga Nidra* (Venkateswaran, 2018).

MUSICAL THERAPY FOR PCOS

In the context of *Yoga Vāsishtha*, *Ādhija Vyādhi* (stress-borne disease) are considered to be diseases that start in the mind (*Ādhi/ stress*) and gain entrance to the physical body through vital energy, manifesting in the form of physical sickness (*Vyādhi*) (Gowda et al., 2017). One of the most important etiological factors of PCOS is stress (Steegers-Theunissen et al., 2020). From an *Āyurveda* perspective, negative emotions such as fear, grief, and disgust, create a biochemical state in our body that is difficult to remove and can lead to disease condition (Peter Marchand, 2006). PCOS is

classified as a *Kapha* condition in *Āyurveda* (Sawant et al., 2017) with the psychological component *Tamas* being the primary cause (Lakshmi C. Mishra, 2003).

The primary therapeutic strategy in music therapy is at the level of emotional healing. Understanding the metaphysical side of one's existence can promote emotional healing. The goal of emotional healing is to replace negative emotions such as criticism, anger, guilt, and resentment with good ones such as affection, compassion, pleasantness, and calmness. When the negative thought pattern is ceased the disease condition also gets reversed (Karuna et al., 2013).

The theory of *Sāmānya Viśeṣa Siddhānta* (Ch. Su.1/44.45.) in *Āyurveda* is relevant regardless of the medical system that practitioners use. In this concept, factors with similar features lead to an increase of that factor's value. Dissimilar causes result in a decline (Loon, 1981). A pleasant *Rasa* can be generated by a certain type of music that expresses a good feeling, and it could be used to replace an unpleasant *Rasa* and reduce wrong thought patterns (Sobhana Nayar, 1989). *Patanjali Yoga Sūtrās* says “*Vitarka bhādhane pratipakṣa bhāvanam*” (PYS 2.33.) which means if someone is troubled by negative thoughts, she should develop the opposite mental attitude (Vivekananda).

The cause of PCOS is *Kapha* imbalance (Sawant et al., 2017), which results in emotional stagnation due to accompanying psychological components of sorrow and disgust. A recent study shows, listening to music may help PCOS women reach sexual maturity regardless of their chronological age (Chakraborty, 2020). Another study on *Āyurveda* found that providing *Mōhana Rāga* as part of intervention together with other *Āyurveda* treatments improved outcome in females with infertility due to polycystic ovarian syndrome (Anvekar, 2021). *Mōhana rāga* which depicts *Śringāra Rasa*, or love in the internal environment. Love is a powerful feeling that may help one overcome sadness and disgust which is the emotional cause of PCOS. *Rāgās* from *Kalyān*, *Bilawal*, and *Khamāj* which employ *Svarās Ri* and *Dha Tīvra* are suggested for PCOS. Various forms of music like that of classical, semi-classical, bhajans, in the specific *Rāga*, can be employed for healing purposes (Sobhana Nayar, 1989). Mirror Neurons are neurons that replicate when a person plays and witnesses another person performing the same action. Aside from its outward characteristics, each *Rāga* has its unique essence in its internal form, which allows the artist and the audience to attain oneness with the Supreme Being (Nagarajan, 2021). Table 1. Shows the *Thāt*, *Svarās* and *Ragās* suggested for PCOS.

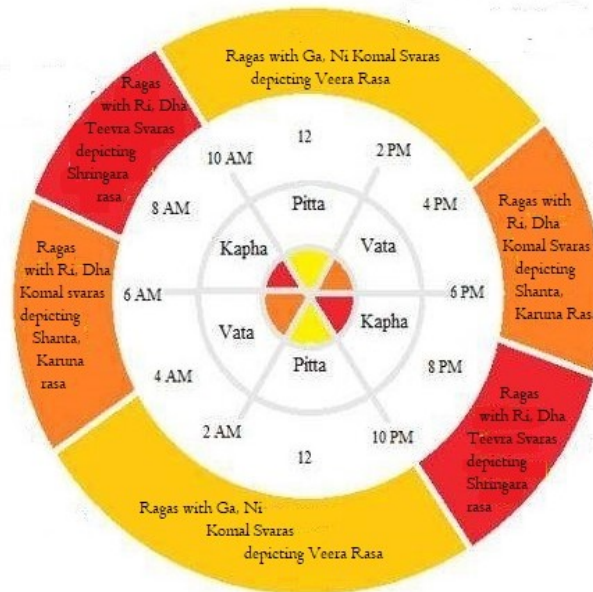
Table 1. Thāt, svarās and rāgās based on time theory suggested for PCOS correlating with the biorhythm principle of Āyurveda

Table 1. Thāt, svarās and rāgās suggested for PCOS							
Disturbed Doṣa	Thāta and Svāra used	Rasa created	Popular derivatives rāgās of this thāta	Carnatic Equivalent and svāra used	Popular Rāgās	Time	Timing
Kapha Doṣa	Kalyān: [Ri, Dha Tivra]	Śṛṅgāra	Śuddha Kalyān	Mēcha Kalyāni	Mohana Kalyāni	Late Evening	7pm- 10pm
			Bhupālī		Mohanam	Late Evening	7pm-10pm
			Kēdar		Nīlāmbari	Late Evening	7pm-10pm
			Hamīr		Hamīr Kalyāni	Late Evening	7pm-10pm
			Yaman		Kalyāni	Late Evening	7pm-10pm
	Bilawal: [Ri, Dha Tivra]	Śṛṅgāra	Alahiya Bilawal	Dhīrasankarābhā ranam	Bilahari	Late Morning	10am-1pm
			Bihag		Behag	Night	10pm-1am
			Śankara		Śankara	Night	10pm-1am
			Durga		ŚuddhaSāveri	Late Evening	7pm-10pm
			Khamāj		Harikāmbōji	Late Evening	7pm-10pm
	Khamāj: [Ri, Dha Tivra]	Śṛṅgāra	Jinjoti	Harikāmbōji	Jinjuti, Navroj	Late Evening	7pm-10pm
			Kalāvati		Valachi	Late Evening	7pm-10pm
			Deś		KedāraGaula	Late Evening	7pm-10pm

The Time Theory of Rāga is an interesting approach in Indian classical music that describes how the efficacy of each Rāga is dependent on the time of its application⁴⁶. According to *Sangeet Makranda*, Narada provides the concept of determining the best time of day to deliver specific Rāgās. He says “*evam kālavidhim gyātvā gāyedhḥ sa sukhī bhavet| rāgāvelāpragānena rāgānam himsako bhavet| yaḥ kṣṛṇoti sa dāridrī āyurnaśyati sarvadā|*” which means peace and prosperity can be attained by singing the Rāga at their allotted periods. If sung outside of their period, the Rāga will become aggressive and lose their attraction. Such (singers) fall into poverty and have a limited life span (Narada). A 24-hour day is split into eight *Praharas* (3-hour time intervals) with each Rāga assigned to a certain *Prahara* (Sundar, 2007). It can be linked to *Āyurvedic* study of the dominance of *Doṣa* (*Vāta*, *Pitta*, and *Kapha*) at different times of the day since each *Doṣa* is believed to be prominent at particular phases of the day and night (Devanand Upadhyay, 2016). It is also recommended that

to balance *Kapha* in the body warm, light foods with astringent, pungent and bitter tastes should be taken. Also, they take low carbohydrate, low-fat diets without sugars avoiding frequent eating, frozen edibles and cold water (Dhanya et al., 2019).

Fig 1. *Rāgās* based on time theory correlating with the biorhythm principle of *Āyurveda*



CONCLUSION

In *Āyurveda*, the major cause of PCOS is the vitiation of *Kapha Doṣa*, which produces heaviness, and the psychological component being *Tamas*. This causes emotional stagnation and is accompanied by feelings of sorrow and disgust. The emotion of love helps to get rid of sadness and disgust. *Rāgās* which uses *Svarās Ri* and *Dha Tīvra*, creates *Śringāra Rasa* or love in the internal environment which may be used for managing PCOS. The practice of *Aśvinī Mudrā*, *Mūla Bandha*, and *Ojus* breathing has been found in studies to be effective in managing PCOS.

A number of scientific studies also point to the fact that PCOS may be triggered by a combination of causes that includes unhealthy lifestyle, hormonal imbalance, diet, genetic and environmental factors. The standard methodology of treatment based on scientific evidence gravitates more towards symptomatic alleviation than handling the root cause. This can lead to several adverse effects. PCOS is a psychosomatic illness that affects both the body and the mind. The three ancient systems of healing namely Music, *Āyurveda* and *Yoga* come under the banner of Mind-Body medicine. These systems emphasize using the mind's ability to alter bodily function and symptoms.

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