



Case Study

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CASE STUDY ON EXPLORATION OF AYURVEDA POTENTIAL IN POTT'S TUBERCULOSIS

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ABSTRACT

Tuberculosis remains the world's deadliest infectious killer despite the availability of highly efficacious treatment for decades and is one of the top 10 causes of death worldwide. Treatment of TB in the Ayurvedic system poses a difficult challenge to the Ayurvedic physician. The objective of this study is to discuss the case of a Pott's spine patient. We conducted a Case report study. We included a report of a confirmed case of Pott's spine, which, after twelve months of regular Ayurvedic treatment, recovered clinically and radiologically from the disease. The patient had an infection with *Mycobacterium tuberculosis*, as revealed by the culture of the drained abscess. The MRI of the thoracic and lumbar spine of the patient showed discitis of the D12-L1 discs with osteomyelitis involving vertebral bodies from D8 to L1. Ayurvedic concepts that include nutritional support, palliative care, and detoxification therapy form the foundation of the treatment of TB. The overall recovery of the patient from such a destructive disease was excellent.

Keywords: Pott's spine, *Mycobacterium tuberculosis*, Ayurvedic treatment

INTRODUCTION

A dangerous illness, tuberculosis (TB), which typically affects the lungs but can also affect other body regions, is brought on by the bacteria *Mycobacterium tuberculosis* (extrapulmonary TB). Vertebral tuberculosis (TB) accounts for 50% of all musculoskeletal TB cases and is the most prevalent spine illness¹. It is more likely to develop in children and young adults². Serious neurologic consequences might arise from not receiving therapy. In traditional medicine, the illness is referred to as Pott's syndrome. The term "tuberculous infection of the spine" first appeared in a monograph by Sir Percival Pott in 1779³. Most of the world is unaware of the prevalence and incidence of spinal tuberculosis. The most effective method of treating TB is still anti-tubercular therapy. A few recent case reports have been reported, although multidrug-resistant tuberculosis (MDR-TB) frequently occurs with spinal disease. Tuberculosis is recognized as a disease in Ayurveda⁴. Maharishi Charaka, who identified the illness around 2000 BC, named it Rajayakshma⁵, while Maharishi Sushruta, who did it in 800 BC, gave it the name shosha. Some old Ayurvedic literature asserts that over a hundred compounds have anti-TB effects. We describe a patient with Pott's spine who could recover from the condition thanks to Ayurvedic therapy.

Pathophysiology

Over 60 different species of the *Mycobacterium tuberculosis* complex are responsible for TB. Only the four most prevalent strains of *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium microti*, and *Mycobacterium africanum*, are known to infect humans⁶. While *Mycobacterium Kansasi* and rare cases of bovine tuberculosis have also been reported⁷, human tubercle bacilli are responsible for the majority of spinal TB cases. There are two types of spinal tuberculosis: spondylodiscitis, which is the normal form, and spondylitis without disc involvement, which is the atypical form.

Infections that spread from surrounding afflicted vertebrae cause intervertebral disc involvement in adults, but the vascularized nature of the intervertebral disc in infants may cause it. Osteomyelitis and arthritis frequently damage multiple vertebrae, a feature of Pott's disease. In the "anterior section" of the vertebral body, the subchondral plate is generally damaged⁸. This circulatory supply to the vertebrae promotes "paradisical" involvement of the subchondral bone on either side of the disc. Additional involvement patterns include "central," which causes vertebral body loss, "posterior," which affects posterior appendicular tissues; and "non-osseous abscess" development⁹. Spinal TB may manifest as progressive bone loss causing vertebral collapse and kyphosis, cold abscess development (due to infection spreading to nearby ligaments and soft tissues), spinal canal constriction from abscesses, granulation tissue, or direct dural invasion, which causes spinal cord compression and neurologic deficits⁸.

Tuberculosis in Ayurvedic Perspectives

Ayurveda is a whole branch of medicine that includes theories about health and disease and techniques for monitoring and treating health issues. Tuberculosis is an ancient illness. The Rig-Veda, a 3,500-year-old document, refers to it. Ayurvedic texts compare Rajayakshma, a disease like tuberculosis. Dhatushaya (tissue emaciation or loss), also known as Shosha, is the primary cause of Rajayakshma. The Charaka Samhita uses the terms krodha, yakshma, jvara, roga, and dukha interchangeably. According to Ayurveda, there are four different pathophysiological causes of yakshma: ayathabalamarambham or sahas (physical exertion beyond one's physical capacity), vegasandharanam (repression of natural urges), kshayam (wasting), and vishamshanam (improper diet).⁹⁻¹¹

Depending on the pathophysiological reason, the patient exhibits various signs and symptoms. In Rajayakshma patients, the

pathogenesis process always starts with this step. According to the Ayurvedic system of medicine, there are three different types of yakshma: trirupayakshma, shadrupayakshma, and ekadashrupayakshma. Yakshma is tridoshja vyadhi, which means that metabolic dysfunction (dhatwagninasana) is unavoidable due to the loss of rasa (tissue fluid), rakta (blood), mamsa (muscle), meda (adipose tissue), and shukra. This ultimately results in a decline in immunity or ojekshaya. According to the pathophysiological processes occurring within the body, yakshma is classified as either anuloma or pratiloma yakshma.

An observational study reveals that unhealthy eating habits, erratic diets, physical activity, repressing one's natural inclinations, and leading a stressful lifestyle significantly impact TB's symptoms. Early stages of TB are characterized by trirupa (3 symptoms), shad rupa (6 symptoms), and ekadashrupa (11 symptoms), whereas chronic tuberculosis is characterized by trirupa (11 symptoms)¹².

Table 1: Signs and symptoms in a patient of Rajayakshma as per Charaka Samhita

Early stages clinical features of Rajayakshma (Tuberculosis)		Clinical features of the Chronic condition of Rajayakshma (Tuberculosis)
Trirupa Yakshma	Shadrupa Yakshma	Ekadashrupa Yakshma
1. Amsa –Parshvaabhitapa (Distress in shoulder and Chest) 2. Kara-Padasantap (Burning sensation in hands and feet) 3. Jwara (Fever)	1. Parshvashoola (Pain in sides) 2. Kasa (cough) 3. Jwara (Fever) 4. Swarabheda (Hoarseness of voice) 5. Atisaara (Diarrhoea) 6. Aruchi (Anorexia)	1. Parshvashoola (Chest pain) 2. Kasa (Cough) 3. Jwara (Fever) 4. Swarabheda (Hoarseness of voice) 5. Atisara (Diarrhoea) 6. Aruchi (Anorexia) 7. Amsashoola (Shoulder pain) 8. Shirshoola (Headache) 9. Raktachardi (Haemoptysis) 10. Shthivan/ Kapha Sraava (Excretion of sputum) 11. Shvasa (Dyspnoea)

Case Study

On February 21, 2022, a 27-year-old man who was an outpatient in the Erode district of an Ayurvedic centre presented with complaints of severe back pain, a rise in fever in the evening, night sweats, weight loss, lethargy, and a lack of appetite. In order to treat Pott's disease (PD), he underwent a six-month anti-TB regimen from February to July 2019. The patient's chest roentgenogram revealed a slight right pleural effusion (Figure 1). In the anterior, posterior, and lateral views, reduced disc space between D11 and D12 was seen on the patient's lumbar spine x-ray (Figure 2). Rifampicin, isoniazid, ethambutol, and pyrazinamide have all been used in his treatment.

Based on advice from several Ayurvedic texts, the patient was put on a regular regimen of "Mahalaxmivilas Ras," 250 mg daily in the morning on an empty stomach, followed by moderate cleansing (samshodhan). The patient received ghrita from sheep and goats processed in the decoction of the sthiradi group of herbs internally and topically for four days. A little fomentation of his body was also permitted on the fourth day. On the fifth day, he was advised to take the powders of *Piper longum* 3 gm in honey and *Terminalia chebula* 6 gm with hot water separately in the morning on an empty stomach, about an hour apart. While the powder from *Terminalia chebula* provided 3–4 times of clean motion, the powder from *Piper longum* caused moderate emesis 2-3 times.

The purifying procedure was therefore finished in five days. While he did not exhibit any neurological symptoms, orthopaedic and neurosurgery experts were called in order to drain the abscess surgically. He was also given a brief course of treatment that included cleansing, local dressing, Panchwalkal decoction and Jatyadi taila as directed. *Mycobacterium tuberculosis* was discovered after four weeks in an abscess that had been drained. After being hospitalized for two weeks, he was released, and outpatient therapy resumed. The medicine's effectiveness was assessed regularly using haematological, biochemical, radiographic, and urine analytical tests. A follow-up MRI after a year of therapy showed that the abscess had healed, and the vertebral bodies had disappeared entirely. The patient's fever and

back pain have subsided. He has a good appetite. Throughout therapy, he added 16 kg to his weight. Throughout treatment, the patient reported no side effects from the medication. His standard of living has improved.

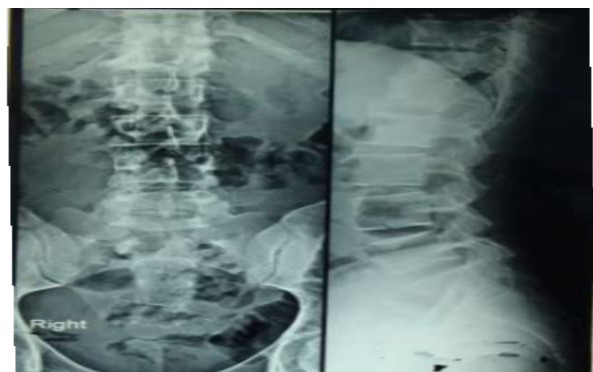


Figure 1: Lumbo-sacral Spine X-ray (AP and Lateral View) showing reduced disc space between D 11 and 12 (Pott's Spine)

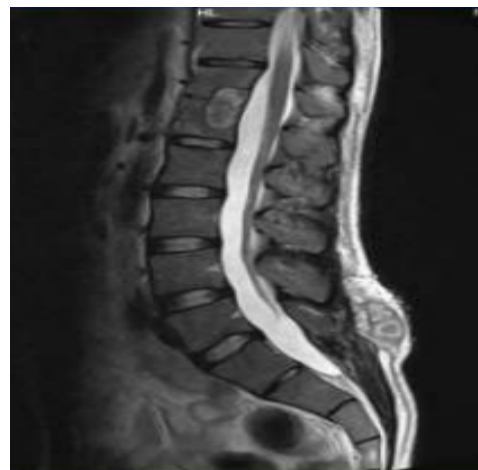


Figure 2: MRI showing osteomyelitis at the level D12 L1 disc and right paraspinal abscess.

Allopathy treatment for POTT’S disease

All patients must be thoroughly watched throughout the first four weeks of treatment for the beginning or development of neurological impairments. In the rehabilitation and response of

people with spinal TB, antituberculosis drugs play a crucial role. Rifampicin, isoniazid, ethambutol, and pyrazinamide are often administered for two months, followed by a six-, nine-, twelve-, or eight-month course of rifampicin and isoniazid. ^{8, 13-14}

Table 2: Allopathic treatment for Pott’s disease

Type of Disease	Definition of a patient with tuberculosis	Course of treatment	
		Beginning phase (once a day or three times per week)	Continue phase (daily or three times weekly)
I	New smear-negative with significant parenchymal involvement, a positive new smear, a negative new smear with significant parenchymal involvement, severe concurrent HIV infection or new, extrapulmonary, severe tuberculosis	2 HRZE	4 HR or 6 HE daily
II	Smear-positive pulmonary TB that has previously been treated, recurrence interrupted treatment, and failure to respond to treatment	2 HRZES/1 HRZE	5 HRE
III	New pulmonary TB with a negative smear, tuberculosis outside the lungs	2 HRZE	4 HR or 6 HE daily
IV	Multi-drug resistance and persistent tuberculosis	Regimens that have been specially created are standard or are unique	

H – Isoniazid, R – Rifampicin, E – Ethambutol, Z – Pyrazinamide, S - Streptomycin

Anti-tubercular Drugs and Hepatotoxicity

Hepatotoxicity is the most typical adverse reaction to anti-TB medication that necessitates therapy discontinuation. Anti-tubercular drug-induced hepatotoxicity (ATDH) has a precise

mechanism that is unclear, although it involves hazardous metabolites. The liver is vulnerable to injury and is crucial in the metabolism and detoxification of drugs. The pathogenesis and drug-induced liver damage (DILI) types are discussed, ranging from hepatic adaptation to hepatocellular toxicity¹⁵.

Ayurveda Products/Herbs for Tuberculosis Disorder

Table 2: Formulations mentioned in AFI which can be helpful in Rajayakshma (TB) / Yakshma (TB) / Kshaya (Phthisis)

Dosage Form	AFI	Name of the formulations
Churna/ Kwatha/ Churna	AFI Part I	Vidaryadi kwatha churna, Karpuradi churna, Yavandyadi churna, Drakshadi churna, Bhaskarlavan churna, Sitopaladi churna
	AFI Part II	Agnimukha churna, Ashwagandhadi churna, Mahatalisadi churna, Madhyamanayika churna, Badaradya churna
	AFI Part III	Lavangadi churna, Yogaraja churna
Vati/ Tablet/ Guggulu	AFI Part I	Mahayogaraj Guggulu, Saptavimshatik Guggulu, Dhanvantar gutika, Shiva gutika, Shankha vati, Suvarna vatak
	AFI Part II	Sanshamani vati
Asava/ Arishta	AFI Part I	Kanakasava Kumaryasava-A, Kumaryasava-B, Dantadyarishta, Dashmoolarishta, Draksharishta, Pippalyadyasava, Vasakarishtha
	AFI Part II	Babbularishta
Avleha/ Paka/ Khanda	AFI Part I	Agastyaharitaki rasayana, Kushmandaka rasayana, Guduchyadi modaka, Chitra Haritaki, Chyavanprasha, Narikela khanda, Pugakhsnda, Vasavleha, Shatavari guda
	AFI Part II	Ardakakhanda avleha, Vyaghri Haritaki
	AFI Part III	Methi modaka, Abhyadi modaka, Brihat Vasavleha
Sneha/ Taila/ Ghrita	AFI Part I	Indukanata ghrita, Eladi ghrita, Chagaladya ghrita, Nirgundi ghrita, Panchatiktaguggulu ghrita, Pippalyadi ghrita, Vidaryadi ghrita, Chandanadi ghrita, Chandanbalakshadi taila, Bala taila, Balashwagandhalakshadi taila, Vasachandanadi taila
	AFI Part II	Madhyam Narayan taila, Visnu taila, Brihat Ashwagandha ghrita
Parpati/ Rasayoga/ Bhasma	AFI Part I	Guduchi sattva
	AFI Part I	Kantavallabha rasa, rasaindura, Panchamrita parpati, Svarna parpati, Manikya pishti, Kapardita bhasma, Tamra bhasma, Pravala bhasma, Mukta bhasma, Yashada bhasma, Vanga bhasma, Vajra bhasma, Vaikranta bhasma, Svarna bhasma, Svarnamakshika bhasma, Haratala bhasma, Chaturbhujra rasa, Chaturmukha rasa, Navaratnarajmriganka rasa, Ngavallabha rasa, Mahalaxmivilas rasa, Muktapanchamitra rasa, Yogendra rasa, Rajmriganka rasa, Laghumalinivasant rasa, Laxmivilas rasa, Vasantkusumakar rasa, Svarnabhupati rasa, Sutshekhara rasa
	AFI Part II	Akika pishti, Akika bhasma, Varatika bhasma, Kanchanabhra rasa, Kantavallabha rasa, Grahaniapat rasa, Vasantatilaka rasa, Hemanath rasa, Kanchanabhra rasa, Brihachhanagarabhra rasa, Shringabhra rasa, Sutshekhara rasa, Yogaraj, Shilajativadi lauha
AFI Part III	Vidyadharabhra rasa, Kancanabhra rasa, Brhat sarvalokasraya rasa, Mahasvasari lauha, Svasakalesvara rasa, Sutasekhara rasa (Svaranaruparahita) ¹⁶	

Current Practices and Research in Tuberculosis

1933 the Patipukur TB Hospital in Kolkata started offering Ayurvedic tuberculosis therapy. A full-fledged research unit was subsequently commissioned with a unique budget. Ayurvedic treatment guidelines were used for therapeutic management for

the first time in pre-independence India. This regimen was discontinued on November 1, 1947, when synthetic anti-tubercular medications became available. Patients were given drugs made in-house that contained calcium, gold, and mercury in the form of fresh juice from herbs cultivated in the hospital garden. There were several formulas used, including

Vasantamalati, Kanchanabhra rasa, Rajamrigankarasa, Bhallataka (*Semecarpus anacardium*), rasayan, Mallasindura, Vasa (*Adhatoda vasica*), and others. The information on using Ayurvedic medicine to treat TB over 13 years is particularly valuable¹⁷. A case study of a 42-year-old male patient who had been diagnosed with pulmonary TB for three years and was treated with shodhana (Vasa ghrita- swedana, vamana), followed by shamana, was included in the renowned Maharashtra doctor Vaidya PT Joshi's collection of his postgraduate thesis, "Role of Panchakarma in Acute Phases of Illness." While antibiotics are beneficial in treating TB, drug-resistant strains eventually render them useless. On the other hand, a recent study concluded that Ayurvedic remedies might solve this growing issue¹⁸.

DISCUSSION

Ayurvedic concepts that include nutritional support, palliative care, and detoxification therapy form the foundation of the treatment of TB. The best treatment for this illness has been determined to be detoxification, which involves oleation, fomentation, mild emesis, and laxation. The fundamental objective of this procedure is to keep the patient's immunity intact while removing disease-causing agents from the body. Oleation, which entails topically applying ghrita from sheep and goats and ingesting it, is the most effective therapy for treating vata sickness¹⁷. The patient's digestive tract secretes enzymes when given ghrita, a herbal remedy produced from the decoction of the Sthiradi family of plants. It aids digestion and stimulates appetite. Fomentation can provide analgesics, better circulation, and a decrease in inflammation. Emesis or purgation are two methods for removing accumulated waste products or toxins from the body that block the channels and cause illness¹⁹. The process of therapy begins with detoxification. It purifies the channels, encourages absorption, and ensures nourishing nutrients are delivered to everybody part without difficulty.

Further treatment after detoxification (samshodhan) therapy is regarded as more successful, with the illness not relapsing once treated. Patients with TB who have poor physical strength are recommended to take mild emetics. When honey was given to the patient on an empty stomach, a reaction of two or three vomits was evoked within half an hour due to the moderate emetic effects of *Piper longum* powder in a dose of 3 gm. When administered to the patient in the morning on an empty stomach at a dose of 6 gm with lukewarm water, *Terminalia chebula* was performed as a soft bowel evacuator, ensuring 3–4 times of clean motion. Many illnesses have received research on the potential benefits of detoxification treatment. According to a study, these procedures enhanced serum immunoglobulin levels, increased haemoglobin levels, normalized liver functions, and increased body weight²⁰.

CONCLUSION

The overall recovery of the patient from such a destructive disease was excellent. "Mahalaxmi Vilas Ras" is a highly effective medicine for treating tuberculosis, according to the therapy findings. The drug is just as effective as RHEZ, used in traditional medicine to treat tuberculosis. It is risk-free, cost-efficient, and successful in eradicating the condition. Even though just one patient is treated, the patient's recovery from illness is outstanding. The findings pave the path for more research into medicine in an innovative medication regimen.

Informed Consent: The study was carried out after taking consent from the subject before participating.

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