



Review Article

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AN AYURVEDIC AND MODERN SCIENCE VIEWPOINT ON TUBERCULOSIS: A REVIEW

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ABSTRACT

Tuberculosis is a major global public health crisis. 25% of world's tuberculosis cases are found in India. It is an infectious disease caused by *Mycobacterium tuberculosis* that mostly affects lungs however can affect other organs or systems too. Patient commonly show symptoms like fever, night sweats and weight loss. Risk of tuberculosis is higher amongst low socio-economic background. It is amongst top 10 killer infectious disease. Tuberculosis and Rajyakshama have some sort of similar clinical presentation. Rajyakshama refers to a group of disorders caused by vitiation of Tridosha and Saptdhatu which is also known as king of all diseases. Rajyakshama is one of the Asthamahagada according to Acharya Charaka. Despite of availability of extremely effective treatment tuberculosis is still a major problem faced by world. This could probably be due to the drug resistance and due to side effects, that anti tubercular medicines possess. In current situation Ayurveda's involvement plays an important role not only in treatment part but also to boost immunity of the patient. thus, helping them to fight infection, this is achieved by Rasayana Chikitsa. An attempt is made to study collaborative approach towards TB. There is a need of integrative approach from modern as well as traditional system of medicine to improve the quality of patient's life suffering from tuberculosis by reducing the side effects of anti-tubercular drugs and to boost immunity against the disease.

Keywords: Tuberculosis, Rajyakshama, Ayurveda, Anti tubercular medicines

INTRODUCTION

Tuberculosis is an ancient disease caused by *Mycobacterium tuberculosis* which mainly affects the lungs, however since TB is a multisystemic disease other systems involved are GI system, lymphoreticular system, skin, CNS, musculoskeletal system reproductive system and the liver. ¹ Major risk factors include socioeconomic factors like poverty, malnutrition, immunosuppressive disorders like HIV AIDS, immunodeficiency disorders. Treatment of tuberculosis includes intake of antitubercular drugs. Commonly use antitubercular drugs can be broadly classified into 5 groups. Group 1 contains the first line of oral antitubercular drugs like Isoniazid [H], Rifampicin[R], Ethambutol[E], Pyrazinamide[Z]. Group 2 includes injectable anti TB drugs like Streptomycin[S], Amikacin [Am]. Group 3 includes Fluoroquinolones like Ciprofloxacin [Cfx]. Group 4 is the 2nd line of anti TB drugs like Ethionamide [Eto], Terizidone [Trd] and Group 5 includes agents with unclear efficacy [not recommended by WHO for routine use in MDR TB]. Tuberculosis remains one of the deadliest and infectious disease in many people despite so many upcoming medicines. This is due to the side effects that they possess. Commonly seen side effects of AKT Drugs are Rifampicin: Nausea, loss of appetite, reddish urination, Ethambutol: Vision impairment Streptomycin: Deafness, Balance disorder, Pyrazinamide: Arthralgia, arthritis, gout, Peripheral neuritis. Hepatotoxicity is the most common side effects of all anti tubercular drugs. Since modern anti tubercular drugs have many side effects there is high need of Ayurvedic management to come into role play.

Need of Ayurvedic intervention: According to the most recent assessment, DOTS is failing to manage the illness where MDR-TB is prevalent. The reasons are 1]. Spontaneous mutation in

chromosomal genes of *Mycobacterium tuberculosis* is a great challenge to anti tubercular drugs 2]. Inadequate treatment: Due to long period of treatment of anti-tubercular drugs which may range from 6 months in pulmonary Tb to 18 months in extrapulmonary Tb, people usually drop out from treatment. 3] Relapse: If there is relapse of tuberculosis infection then there are chances that the drugs would not respond in expected manner, especially in those who have not taken proper medication in earlier infection. 4]. Missed dose or wrong dose: Not having proper dose or missing anti tubercular medicines may lead to MDR TB. 5] Side effects: The AKT drugs has many side effects. These side effects bother the patient more than the anti-tubercular medicines.

Acharya Charak has elaborated the importance of healthy body in Rajyakshama Nidanstan ², it states that we should keep all our work aside in order to get a healthy body and a healthy life. If one lacks a healthy body there is absence of all, Bhavas [factors] one cannot follow *Dharm, Artha, Kaam, Moksha*, hence keeping the body healthy is the supreme necessity. If one does not focus on this then their body will suffer from various ailments like Rajyakshama. Acharya Charaka has mentioned Rajyakshama in Asthamahagada. In Susruta Samhita Sankramak Roga [infectious diseases] is described as Aupsargika Roga. It spreads through physical contact, eating with others, sexual contact, sharing clothes and touching infected objects and Rajyakshama is one of them ³. Various synonyms of Rajyakshama have been given by Acharya Sushrut ⁴ like Anekroganut [Group of many Updravas], Bahurogpurogam [Many Purvarupa like Shwasa, Kasa, Aangamarda are present in it.], Durvigyeyo [Difficult to understand], Durnivarya: [Difficult to treat]. Shosha:[due to Shosha of Rasadi Dhatu] Kshya [Due to depletion of Kayaik, Mansik and Vachik Karma].

Nidanpanchak

1. Hetu: The primary factors that are responsible for the occurrence of a disease is called as Hetu. Hetu can be divided into two categories. Sannikrutha Hetu: Factors which cause Dosha Prakop immediately. Viprakutha Hetu : Distant causative factors that lead to diseases. In Rajaykshama four Hetu are mentioned in Charaka Samhita. 1. **Sahas:** When person does work beyond his capacity e.g. weak person fighting with a strong person, exercise with big bow, speaks too much, swims run more than his capacity.⁵ 2. **Sandharan:** Due to suppression of natural urges of Apan Vayu, Mala ,[faeces], Mutra [urine] 3. **Kshya:** This again has two types Anulomana kshya and Pratiloma kshya: Excessive Shoka, Chinta, Irshya, Bhaya, [fear] Atiruksha Annapan Sevan are factors of Anulomana kshya or Dhatukshya . Whereas Pratiloma kshya or Shukrakshya janya is due to Ativyavaya 4. **Vishamashan:** An Unhealthy dietic pattern is one of the main reasons of Rajyakshama. Due to Strotasavrodha most of the food that is eaten is converted into Mala and Mutra, thus that person is depended on the Mala (Purish) hence the Mala Bhaga should be taken care while treatment.

2.Purvarupa: The prodromal feature of a disease is called as Purvarupa. Pratishaya, repeated sneezing, sweetening of mouth, anorexia, nausea, swelling on face and legs, Kayebhibhista darshanam, [making fault in own body], weakness, Bala Mamsa kshya [weakness] are some of the Purvarupa of Rajyakshama.

3.Rupa: Rupa or Lakshanas are the symptoms that are present in a disease Acharya Charaka has divided the symptoms of Rajyakshama into 3 groups i.e. Trirupa, Shadarupa and Ekadhasa Rupa. Trirupa lakshanas : 1. Amsa-Parshvaabhitapa 2. Kara-Pada Santap 3. Jwara [fever]. Shada Rupa:1. Parshvashoola 2. Kasa [cough] 3. Jwara 4. Swarabheda 5. Atisaara [diarrhea] 6. Aruchi Ekadhasa Rupa: 1. Ansatapa 2. Kasa 3. Jwara 4. Swarabheda 5. Atisaara 6. Aruchi [anorexia] 7. Ansashoola 8. Shirshoola 9. Raktachardi 10. Sththivan/ Kapha Sraava 11. Shwasa

4.Samprapti. One of the primary causes of pathogenesis in Rajyakshama is widely acknowledged to be Dhatukshaya. The consumption of Rajyakshama Hetu leads to Strotavrodha as a result of which there is Poshan Abhava which leads to Uttatuttar Dhatukshaya i.e Kshya of Ras, Rakta, Mamsa, Meda and Sukra. This is called as Anulomaka Kshya. Whereas on the other hand Pratilomaka Kshaya occurs due to Vataprakopa caused by Shukrakshya which is due to Ativyavaya.

5.Chikitsa: Ayurvedic management is broadly classified into 3 categories Ahar Vihar, Shodhan chikitsa, Shaman chikitsa.

A] Ahar – Mamsa Sevan – Aja Mamsa Sevan, Lava, Tittir mamsa sevan has been indicated in Rajayakshma. As there is Mamsa kshaya in Rajyakshama consuming Mamsa will help in increasing Mamsa dhatu of the patient according to Samanya Vishesh Siddhant⁶. Dugdha Sevan [specially Aja dugdha]: Aja dugdha is Agnideepak i.e. it increases appetite, it is Laghu i.e easy to digest and is Sangrahi i.e. absorbent⁷. It also helps in curing Shwas [Dyspnea], kasa [cough] and Raktipitta [bleeding] and is also said to be sarvarogahar⁸, hence is very useful in Rajyakshama. Yava, Godhum: They are Madhur Rasatmak, they help in nourishing and increasing the strength of Dhatus [body tissue]. Madya Sevana: Due to its Ushana, Tikshan, Vishad, Sukshma Guna it has fast action, It helps in clearing Strotavrodha. **Vihar:** Deshantargaman is the unique thing only mentioned in Ayurveda. Tb patient should live in places where food water and air is not contaminated, should avoid living in crowded, damp places. Apathya: Vyavaya, Ativyayama, Krodha, Diwaswapa [day sleeping] should be avoided.

B] Shodhana Chikitsa: Only if Rajyakshama patient is strong enough and if there is great aggravation of Dhoshas then only Shodhan Chikitsa should be administered, because if Shodhan is done in weak person then the result would be adverse. However even in strong patient only Mrudu Shodhana should be done and Mala and Retasa should be conserved. Panchakarma like Vaman and Virechan can be done prior to Snehan and Swedan.

C] Shamana Chikitsa: It basically involves using drugs of formulations that helps in treating the symptoms or main cause of Rajyakshama. These are: Chyavanprasha Avleh- It is made from Asthvarga dravyas. It is the best Rasayan and is well known to boost immunity, this Avaleh is best in dry cough, Jirnajwar, and weakness⁹. Arogyavardhini vati- Reduces night sweat, Agnimandya. It opens the Dhatuvaha Strotasavrodha. Suvarmalini vasant: Suvarna and Mukta are Kshayanashak and Shakti Vardhak drugs which spreads fast in body. Shilajatu Gutika: This is useful where Shukra Kshaya is prominent. Other medicine like Shastra puti or Shatputi Abhrak, Chaturmukha Rasa, Mahalakshmi vilas ras provides strength to lungs, Vasantkusumakar Ras, Guduchiamrut, Mahasudarshan vati, Tribhuvan kriti ras, Laghupanchamula kwath is useful in fever. Sitopaladi churn with Madhu or Ghee is useful in Kas. If there is pain in thoracic region Sarshpa lep is applied locally. Jatipahladi churn is used in Atisar. In Arochka Talisadi churn, Yavanishadava churn is used.

DISCUSSION

In last few years a range of new treatment option have emerged in modern science. Commonly rifampicin and pyrazinamide are best line sterilising drugs, but a faster sterilisation phase activity is needed for shorter regimes. For this, compounds with strong bactericidal activity against dormant M. tuberculosis cultures are needed¹⁰. The compounds with anti-mycobacterial activity which under pipeline are Nitroimidazoles, Riminophenazines, Diarylquinoline, Pyrazimide analogues Spectinomycin, Posizolid etc.¹¹. There are many ongoing and completed studies which have changed the conventional line of treatment and have tried to use new drugs for faster treatment like Diarylquinoline, Nitroimidazopyran, Oxazolidinones, Moxifloxacin, rifapentine. Studies suggests that Rifapentine has greater in vitro potency than rifampicin and longer serum half-life. One multi-centre phase clinical IIb study conducted in North America, Spain, Brazil, Peru recently described equivalent 8-week sputum culture conversion rates between 2-month intensive phase regimes of rifapentine-isoniazid-pyrazinamide and standard RHZE¹². The main aim of these studies is to progress towards shorter therapy. Antitubercular drug along with Ayurvedic preparations can be helpful to improve quality of life of the patient suffering from tuberculosis, to increase the bioavailability of the drug as well as to reduce the treatment duration. Various Ayurvedic drugs can be used to cope up with the side effects that one face while consuming antitubercular medicines. Vasa has Vasicine which is antitussive and antimicrobial. Rason has sulphur, Diallyl polysulfides which is bacteriostatic and also reduces congestion. Shunti, Vidang Pippali helps in igniting the Agni due to their Ushna Guna. Bhunimba, Daruharidra Nimba helps in avoiding the hepatotoxic effect of Akt drugs. Ashwagandha, Rasna, Nirgundi helps in treating the arthralgia which is side effect of pyrazinamide as they have anti-inflammatory property. Nausea is controlled by Amalaki, it has vitamin C which also boosts immunity and digestion. Some of the clinical evidence are also generated for herbs like Ashwagandha, Pippali, Garlic, Guduchi, and preparations like Vasa Ghrita, Jeevantiyadi Ghrita, Chyavanprash, which are proven beneficial in the management of tuberculosis¹³. Rasayan Chikitsa too is a crucial part of treatment which prevent relapse or drug resistance, some include

Vardhamana Pippali Rasayan, Chavanprasha, Shilajeet Rasayan. Hence the principle of Ayurveda helps in dealing with the difficulties that one face with anti-tubercular medications and improving the quality of life.

CONCLUSION

Rajyakshama [Tuberculosis] is one of the chronic illnesses that has been around for thousands of years. There are medications available for treatment, but the issue of drug resistance and unfavourable side effects from prolonged anti-TB medication use is rather prevalent. Side effects of Akt drugs and drug-resistant TB is a major problem. Therefore, it is important to find new, efficient treatments options for TB. The traditional knowledge of plants is surely one such way, Ayurveda thus comes into role play. Ayurveda has given detailed information regarding its Hetu, Lakshanas, Samprapti, and Chikitsa. More scientific evidence of Ayurvedic principle and their treatment modalities on tuberculosis are needed to be published in future, and for that purpose collaborative approach is needed from modern as well as Ayurveda.

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