

## EFFECT OF MUSTADI YAPANA BASTI ON VYADHIKSHAMATWA WITH SPECIAL REFERENCE TO T.B SPECIFIC IMMUNOGLOBULIN ESTIMATION IN RAJAYAKSHMA

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### ABSTRACT

*Rajayakshma (tuberculosis)* is a well-documented disease in the *Ayurveda* classics since time immemorial. In this disease, *Bala* (strength), *Oja* (vitality) and *Vyadhikshamatwa* (immunity) are greatly hampered. Though the *Ayurvedic* medicines are time tested and very much efficacious in all other diseases, yet it is left disregarded in the treatment of *Rajayakshma* in last few decades. In practice, few instances of improvement in the cases of *Rajayakshma* and the tremendous efficacy of *Mustadi Yapana Basti* (special type of medicated enema) in various diseases especially in the *Kshayaja (debilitating)* condition of body raise a question about the effect of *Mustadi Yapana Basti on Rajayakshma*. The review has suggested that, based on obtained result, *Mustadi Yapana Basti* is a very effective therapy to mitigate signs and symptoms of *Rajayakshma*. A more rigorous evaluation is needed to finalize the definitive guideline regarding the treatment of this dreadful disease.

**Keywords:** *Rajayakshma*, Tuberculosis, *Vyadhikshamatwa*, Immunity, Immunoglobulin, IgG, IgM, *Oja*

### INTRODUCTION

The term *Rajayakshma* consists of two words, ‘*rajan*’ and ‘*yakshma*’ which literary mean King’s evil or the disease of King<sup>1</sup>. It is a disease which can be manifested after many a diseases as sequel or many diseases may also develop after this disease<sup>2</sup>. It causes degeneration and destruction of body and mind both. It diminishes the tissue elements. So it is also called as ‘*kshaya*’<sup>3</sup>. *Rajayakshma* is called as ‘King of all diseases’.

The causative factors of *Rajayakshma* are of four categories namely *Sahasa* (over exertion), *Vegadharana* (suppression of natural urges), *Vishamashana* (irregular dieting), and *Dhatukshaya* (depletion of tissues)<sup>4</sup>. There are many signs and symptoms available in different *Ayurvedic* classics. Among them *Amsha-Parshvabhitapa* (pain in chest and shoulder), *KarapadaSantapa* (burning in hands and feet) and *Jvara* (fever) are the general as well as cardinal features<sup>5</sup> where as *Kasa* (cough), *Jvara* (fever), *Parshva-*

*Shula* (chest pain), *Svarabheda* (hoarseness of voice), *Atisara* (diarrhoea), *Aruchi* (anorexia) are the associated symptoms termed as *Shadarupa* (six specific symptoms) of *Rajayakshma*<sup>6</sup>.

In classics, *EkadashaRupa* (eleven characteristic features) of *Rajayakshma* originating from each etiological factor has been described<sup>7</sup>. In all, eighteen major signs and symptoms have been described which includes *Shirasah Paripurnatwa* (heaviness in head), *Shleshma Chhardanam* (cough with sputum), *Jwara* (fever), *Shwasa* (dyspnoea), *Arochaka* (anorexia), *Kasa* (cough), *Shonita-Shthivnam* (haemoptysis), *Swarabheda* (hoarseness of voice), *Parshwaruja* (pain in the sides of chest), *Ansavamarda* (pain in shoulder), *Atisara* (diarrhea), *Daurbalya* (weakness), *Ddaha/Antardaha* (burning sensation), *Pratishyaya* (corhyza), *Shula* (pain abdomen), *Shotha* (oedema), *Avipaka* (indigestion) and *Shirahshoola* (headache)<sup>8</sup>. Of these total eighteen features; *Pratishyaya*, *Sleshma-Chardana*, *Shonita-Shthivnam*, *Swarabheda*, *Jwara*, *Atisara*, *Kasa* and *Shwasa* are due to debility of immune system.

In modern perspective, *Rajayakshma* can be compared with tuberculosis which is an infectious disease caused by '*Micobacterium tuberculosis*'. It is a major public health problem especially in developing countries of Asia and Africa. Globally 2 billion people are infected with tubercular bacillus. In 2013, there were 9 million people were affected with T.B and 1.5 million deaths due to this disease<sup>9</sup>. In 2012, there were an established 1,70,000 deaths of multi drug resistant T.B (M.D.R-T.B) and 450,000 new cases of MDR-TB<sup>10</sup>. In India, more than 40% of an adult population is infected with T.B and about 2.1 million people develop T.B in India in 2013<sup>11</sup>. The predominant symptoms of pulmonary T.B are cough, dyspnoea, chest pain, haemoptysis. In addition, there may be constitutional symptoms such as fever, night sweat, anorexia, loss of weight and tiredness<sup>12</sup>. So tuberculosis is a dreadful disease in developing countries of the world. Its management includes varieties of anti tubercular drugs which have various side effects. Therefore, there is definite need to explore more efficacious and radical cure to the illness. With this background, present clin-

ical study has been intended to assess the efficacy of '*Mustadi yapana basti*' in immune deficit state of *Rajayakshma*.

#### **Aim and Objectives:**

1. To assess the role of *Vyadhikshamatwa* (immunity) in *Rajayakshma* with special reference to T.B. specific Immunoglobulin estimation.
2. To assess the efficacy of *Mustadi yapana basti* in the signs and symptoms of *Rajayakshma*.
3. To assess the efficacy of *Mustadi yapana basti* in the T.B. specific Immunoglobulin level.

#### **Materials and Methods:**

**A. Study Area:** Total 12 patients of *Rajayakshma* were selected from the OPD of Govt. Akhandanand Ayurveda College and Hospital and Maniben Hospital, Ahmedabad.

**B. Sample size:** 12 patients.

**C. Sample design:** selected patients of *Rajayakshma* were administered *Mustadi yapana basti* with classical method for consecutive eight days in the first month followed by a placebo tablet prepared from roasted wheat in a dose of two tablets (250 mg each) twice daily for 21 days. In the second month, same schedule was repeated with *basti* therapy for initial 8 days followed by placebo tablets for another 21 days. Throughout the entire therapy, patients were advised to avoid '*Pariharya*' (things to be avoided) subjects and to maintain a planned dietary regimen. Laboratory investigations were repeated after the completion of therapy. Body weight is measured in every month. Total therapy was performed in OPD level.

**D. Study period:** 2 months

**E. Drop out:** No drop out was there, but T.B specific Immunoglobulin level could be estimated before and after treatment in eight patients only.

**F. Follow up:** Patients were reviewed after interval of every 7 days for a period of 60 days. In the follow up, patients were assessed on the basis of assessment criteria.

**G. Inclusion criteria:** Patients having classical signs and symptoms of *Rajayakshma* according to *Ayurvedic* classics and having at least one positive

value of T.B specific IgG and IgM were selected for this study irrespective of their age, sex, religion, caste, socio-economic status etc.

**H. Exclusion criteria:** Patients of *Rajayakshma* having severe systemic disorder such as AIDS, malignancy, diabetes mellitus, leprosy and hypertension etc. were excluded from this study.

**I. Diagnostic criteria:**

1. Detailed history on the basis of classical signs and symptoms of the disease *Rajayakshma*.
2. Estimation of T.B specific Immunoglobulin: at least one positive value of T.B specific IgG and IgM.

**Preparation of Mustadi yapana basti:** *Kwatha* (decoction) for *Mustadi yapana basti* is prepared from 25 gm each of *musta* (*Cyperus rotundus*), *ushira* (*Vetiveria zizanoids*), *bala* (*Sida cordifolia*), *aragvadha* (*Cassia fistula*), *rasna* (*Pluchea lanceolata*), *manjistha* (*Rubia cordifolia*), *katurohina* (*Picrorrhiza kurroa*), *Trayamana* (*Gentiana kurroo*), *Punarnava* (*Boerhavia diffusa*), *Bibhitaka* (*Terminalia bellerica*), *Guduchi* (*Tinospora cordifolia*), *Gokshura* (*Tribulus terrestris*), *Shalaparni* (*Desmodium gangetium*), *Brihati* (*Solanum indicim*), *Prishni Parni* (*Uraria picta*) along with eight *madana phala* (*Randia dumetorum*). *Kwatha* is prepared by adding eight times of water. *Kwatha* is to be taken 250 ml and added with 250 ml of cow milk and boiled again till it reduces to 250 ml.

*Kalka* (paste) was prepared with the powders of *kutaja* (*Holarrena antidysentrica*), *priyangu* (*Callicarpa maerophylla*), *shatapushpa* (*Anetum sowa*), *rasanjana*, *yastimadhu* (*Glycyrrhiza glabra*) and *kantakari* (*Solanum surattense*) in equal parts.<sup>13</sup>

After preparation of *kwatha* and *kalaka*, *basti* recipe was prepared as per classical method<sup>14</sup>. First of all, 12 gm of *saindhava* (rock salt) is to be added with 125 ml of honey. 125 ml of ghee is to be added then. 60 ml of *kalka* followed by 250 ml of *kwatha* are to be added into it and stirred properly. Then 100 ml of *mamsa rasa* (meat soup) is to be added with it<sup>15</sup>. Few among the patients refused to add *mamsa rasa* because of their religious practice, 100 ml of *masurayusha* (soup of *masura* pulse) was added instead of *mamsa rasa* in those cases.

**Dose:** *Mustadi Yapana Basti* was given to the patient for consecutive 8 days in a dose of approximately 600-650ml/day as per the ability of retention of a patient on that particular day.

**Diet:** Patients were advised to take diet which is indicated for *Rajayakshma* and to avoid *Apathya* (not suitable foods). The patients, who are non vegetarian, were advised to take mutton, chicken, etc. All were recommended to take milk daily and to maintain their routine diet without much alteration.

**Criteria for assessment:** The signs and symptoms of the patient were assessed before and after treatment by grading them with some special scores. They are as follows:

**Table 1**

Symptom	Grade	Findings
Kasa	0	No <i>Kasa</i>
	1	<i>Kasa Vega</i> sometimes
	2	Frequent <i>Kasa</i> but not troublesome
	3	Troublesome <i>Kasa</i> but not disturbing the sleep
	4	Very troublesome <i>Kasa</i> not allowing to sleep in night
Jwara	0	No <i>Jwara</i>
	1	Some days in a weak
	2	Fever everyday but have mild grade
	3	Fever everyday but have moderate grade
	4	Fever everyday with severe grade
Rakta nisthivana	0	No haemorrhage
	1	Sometimes some drops of blood in sputum

	2	Sputum always contains some drops of blood
	3	Blood stained sputum
	4	Frankblood in sputum
Swarabheda	0	Normal voice
	1	Slight hoarseness of voice
	2	Hoarseness of voice
	3	Difficulty in distinguishing pronunciation
	4	Unable to distinguishing pronunciation
Daurbalya	0	No <i>Daurbalya</i>
	1	Fatigue after heavy work
	2	Unable to do heavy work
	3	Unable to do slight exertion
	4	Unable to do normal routine work
Shwasa	0	No <i>Shwasa</i>
	1	<i>Shwasa</i> after heavy work relieved by rest
	2	<i>Shwasa</i> after heavy work not relieved by rest
	3	<i>Shwasa</i> on slight exertion
	4	<i>Shwasa</i> even at rest
Shiroruja	0	No Headache
	1	Sometimes Headache
	2	Headache quite often
	3	Continuous Headache but not disturbing sleep
	4	Unable to sleep due to Headache
Pratishyaya	0	Not seen
	1	Mild
	2	Moderate
	3	Marked
	4	Severe

**Observations and Results:** The results obtained are critically and statistically analyzed and presented in the form of tables.

**Observation-**Total twelve patients were selected for the study comprising eleven males and one female. Of these 33.33% of patients were in the age group of 30-40 years. Maximum of them (58.33%) were from lower socio-economic status. Mostly (83.34%) of these patients were used to *Vishamashana* (irregular dietary habits) and *Jatharagni* (digestive power) of 66.67% of patients was of *Mandagni* (a type of *Agni*) type. In 41.67% of the patients, *kshaya* was found as the causative factor for *rajayakshma*.

All these cases were having *Jwara* while *Swarabheda*, *Kasa* and *Shwasa* were seen in 91.67%, 50% and 91.67%, respectively. Besides that *shleshma-*

*chhardana* and *pratishyaya* were found in 66.67% and 83.33% cases. *Shonita-sthivana* was observed in 16.67% patients. But none of the case in the study was having *atisara*.

**Result:** Complete relief was obtained after therapy in *jwara*, *Shonita sthivana*, *Pratishyaya*, *Shoola*, *Shirah shoola* and gradual loss of weight (100%). *Shwasa* was relieved up to 71.43%. *Kasa* was relieved up to 85%. *Swarabheda* also was mitigated up to 81.82%. The relief in *Shirah shula* and *Shleshma chhardana* were 95.83% and 94.12% respectively. IgG, IgM, ESR level were decreased 23.11%, 10.63% and 37.88% respectively after therapy. Body weight and Hb percentage were increased 8.88% and 12.60% respectively after two months.

## DISCUSSION

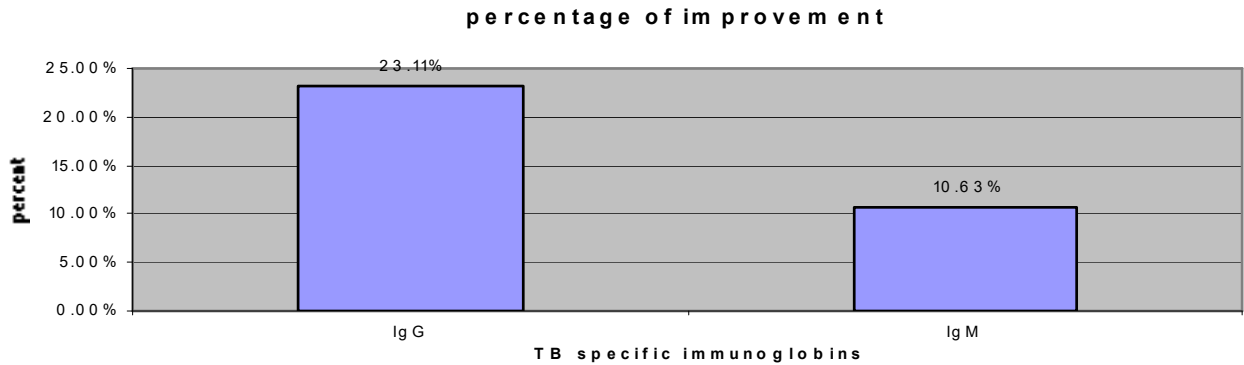
*Rajayakshma* is a disease in which *Bala* (physical strength), *Oja* (elan-vitae) and *Vyadhikshamatwa* (immunity) are hampered. Healthiness of *Dhatu* (tissues) and *Agni* (digestive fire) maintains *Bala* of the Body. By some specific *Nidana* (causative factors) like *Sahasa* (strenuous physical work), *Sandharana* (withholding the natural urges), *Kshaya* (diminution of body tissues) *Vishamasana* (irregular eating habits), and *Upasarga* (contamination), *Dhatu* and *Agni* become altered to manifest the disease *Rajayakshma*<sup>16,17,18</sup>. These causative factors are basically responsible for *Ojo-Kshaya* (deficiency of *Oja*) state of body. The *Oja* described here is mentioned for the *AparaOja* that is different from *Para-Oja* responsible for life. This *Oja* is responsible for the physical strength and immunity of the body. It provides *Vyadhi bala virodhikatwa shakti* (capability to resist the strength of disease). Due to loss of this type of *Oja*, resistance power of the body is diminished making body susceptible for all type of infections<sup>19</sup>. The bacteria of tuberculosis are able to invade the body in such conditions and become able to proliferate superlatively. So this disease is very much common in immune deficit state of body like H.I.V., corticosteroid or other immuno suppressive therapies<sup>20</sup>. *Vyadhi bala virodhikatwa shakti* (capability to resist the strength of disease) protects the body from *Viprakrista nidana* of any disease. If a person takes *Ahara* (diet) regularly maintaining all the protocols of healthy living, like non holding of natural urges, avoidance to excessive physical workouts and other factors causing diminution of body tissues, he may protect himself from the disease in spite of having *Sannikrista Nidana*. So in all the *Ayurvedic* texts, importance has given to the *Viprakrista Nidana* as prime etiological factors for *rajayakshma*. Though all three *Doshas* are involved<sup>21</sup> in pathogenesis of *Rajayakshma*, it is the dominance of *Kapha* that cause obstruction of the channels. *Dhatu* that cannot be nourished due to obstruction of *Srota* (channels) acts as *Dushya*. This obstruction causes provocation of *Vayu* which in turn carries other *Doshas* to *Urdhva* (upward), *Adha* (downward) and *Tiryaka* (lateral) site of the body to produce different

types of symptoms of *Rajayakshma*. Sometimes a disease may be the cause for other diseases and itself is termed as *Nidanarthakar Roga*. Diseases like *Jwara*, *Pratishyaya*, *Raktapitta*, *Shwasa* and *Kasawhen* left untreated or not treated properly may turn to *Rajayakshma*<sup>22</sup>. In this case all these mentioned diseases work as *Nidanarthakara Roga*. Besides these *Nidanarthakara Roga*, *Shosha* (i.e. *Rajayakshma*) may also be manifested when any disease is left untreated. This happen because of compromised resistance power of the body in long standing disease conditions which make it more susceptible for various infections. Due to this reason, susceptibility of *Rajayakshma* is increased manifold in patient having *Prameha*<sup>23</sup>, *Gulma*<sup>24</sup>, *Grahani* etc. Besides that this disease is found commonly in devitalized condition such as chronic malnutrition, chronic renal failure, leukemia, gastrectomy, lymphoma and other malignancies. Various types of treatment procedures are mentioned in *Ayurvedic* classics for *Rajayakshma*. In this disease *Shodhana* (purification therapy) can also be administered when *Dosha* are in excess; but it should be mild. *Sushruta* has mentioned *Basti karma (Asthapana)* as routine procedure after *Vamana (emition)* and *Virechana (purgation)* to the patients of *Rajayakshma*<sup>25</sup>. *Charaka* also has mentioned *Basti karma* to treat *Ansaparshwa shirah shula* to alleviate *vata* and at the end of *Chikitsa* (treatment) he has mentioned *Basti karma* in the treatment summary<sup>26</sup>.

As far as *Samprapti* (pathogenesis) of *Rajayakshma* is concerned, choice of treatment should be such that it should have *Rasayana*, *Brimhana* and *Tridoshaghna* properties so that pathology of the disease can be broken and immunity can be increased. *Mustadi yapana basti* is selected because of these facts. It offered relief in all signs and symptoms of *Rajayakshma*.

**Effect on body weight:** Estimation of body weight was done to find out the co-relation between body weight and *DhatuKshaya*. All the 12 cases were below the normal weight in respect to their age and sex. Table no.47 shows that, after the administration of *Mustadi yapana basti*, body weight increases in 8.88% ( $p < 0.02$  after first month and  $p < 0.001$  after second month). It proves the efficacy of *mustadi yapana basti*

in increasing the body weight as well as the potency against *rajayakshma* as *bala mamsa parikshaya* is a prime sign of this disease (Table No. 47).

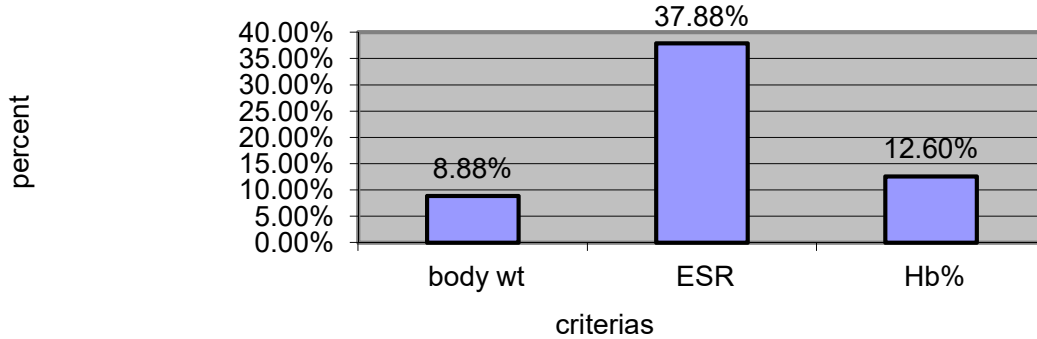


**Effect on Immunoglobulin:** The Table 48 shows the effect of *mustadi yapana basti* on T.B. specific IgG and IgM values. The total reduction of IgG value is 23.11% ( $p < 0.05$ ) and IgM value is 10.63% (p value insignificant). The result revealed may be due to wide range of deviation of the values. Moreover in one case, IgG value was increased after treatment. When all the signs and symptoms are improving, body weight is increasing; increase in IgG level is not always bad. "Immunologically weak patients will develop an anergic condition brought about, at least in part, by the bacillus itself. A successful therapy, observed through improving clinical signs and culture negativisation, is often accompanied first by an increase in IgG titres followed by decreasing IgG titres during therapy, provided the therapy was not given too late. If the therapy is failing, or if the patient is relapsing, the IgG titres will again increase". All patients having elevated IgM titres showed lowered values after treatment except one. In two cases IgM values were within normal limit initially, which increased

after therapy though those values were also within pathological limit. Probably this factor makes the IgM result statistically insignificant. So it can be said that *Mustadi Yapana Basti* has definite role on *Vyadhikshamatwa* (T.B. specific Immunity).

**Effect on Haematological values:** Maximum number of patients had Hb% level in between 9-11gm% (mean 10.25). After treatment with *Mustadi Yapana Basti* it is improved up to 12.60% (mean 11.54  $p < 0.001$ ). This result is highly significant. E.S.R. shows decline by 37.88%. The initial mean score was 86.67/1<sup>st</sup> hour, which was reduced to 58.83/1<sup>st</sup> hour showing highly significant improvement ( $p < 0.001$ ). In all cases TLC was in between 4000-11000/cmm of blood. There is no relation between TLC and Post primary Tuberculosis; because at that case TLC may be normal, low or high. In our study, all patients show lymphocyte and Monocyte count within normal level. Lymphocytosis and Monocytosis are sometimes present as Haematological findings in Tuberculosis<sup>27</sup>.

### Improvement in various criterias



#### Mechanism of Action:

A person having good quality of *Bala* may overcome many types of disease<sup>28</sup>. *Basti* enhances *Bala* immediately<sup>29</sup>. It is also indicated in the complications due to excessive sex in the *Pariharakala* (time period for prohibited activity)<sup>30</sup>. It has also *Rasayana Guna*. *Rasayana* means which maintains the flow of *Poshaka rasa* (nutrients). *Rasayana* generally is *Agnivardhaka* (enhancer of digestive fire) and *Sroto Vishodhaka* (channel purifier) in nature<sup>31</sup>. At the same time it improves the quality of *rasa Dhatu* and *Dhatwagni* (metabolic enzymes). As a result, formation of better *Dhatu* takes place. *Yapana Basti* is a special group of *Basti* which is used to increase *Bala*, *Mamsa* and *Shukra*. These are also indicated in *Kshayaja Rogas* appearing as consequences of prohibited act during *Parihara Kala*<sup>32</sup>. It is a very safe and efficacious *Basti*, which prolongs life and stays inside the body for a long time<sup>33</sup>. Considering these facts, *Mustadi yapana basti* was selected which have *Shodhana* as well as *Rasayana* property. Moreover, *Mustadi yapana basti* is the best among all *Yapana basti*<sup>34</sup>. All the *Dhatu*s gets nourished by *Mustadiyapana basti* enhancing body's own *Dhatwagni* to maintain *Dhatuamyia* (homeostasis) and to increase the resistance of the body towards the invasion of the disease.

#### CONCLUSION

Considering the broad spectrum pharmacological action of *Mustadi yapana basti* it can be concluded that it is much better option for treating disease like *Rajayakshma* as well as resistant variant of Tuberculosis. The treatment also reduces the cost and chance of adverse effect of the Modern drugs used in T.B. Further study should also be carried out in large sample to establish the role of the said therapy in this disease.

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