GOAT MILK: BOON FOR PULMONARY TUBERCULOSIS PATIENTS

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INTRODUCTION:
Pulmonary Tuberculosis remains a major public health problem in developing countries. It causes due to infection with Mycobacterium tuberculosis. It causes 2 million deaths per year in all over the world. Majority of the cases are likely to occur in the world’s poorest nations, who struggle to cover the cost associated with management and control programme. Thus review of goat milk according to ayurvedic and modern literature was done. It has efficacy against kshaya, kasa, shwas, atisara etc. It has deepana, laghu, balya, grahi properties. According to modern research, it has anti-fungal, anti-microbial properties which affect lungs. It also has immunological role in gastrointestinal infections. Also goat milk has higher content of medium chain fatty acids which are easy for digestion and used as medicine for malabsorption syndrome and steatorrhea.

KEYWORDS: Goat milk, pulmonary tuberculosis, Rajayaksha, Chhagaseva.

ABSTRACT
TB statistics published by WHO in 2015 includes India amongst the 14 TB, MDR TB and TB/HIV high burden countries. Pulmonary tuberculosis is correlated with Rajayaksha mentioned in Ayurvedic texts. Currently, TB hospital, Shivdi declared that clinical study on goat milk will be carried out on tuberculosis patients as they found remarkable improvement in some patients who received goat milk along with AKT. Aja kshira (Goat milk) is important Ayurvedic drug in chikitsa of Rajayaksha vyadhi. Thus review of goat milk according to ayurvedic and modern literature was done. It has efficacy against kshaya, kasa, shwasa, atisara etc. It has deepana, laghu, balya, grahi properties. According to modern research, it has anti-fungal, anti-microbial properties which affect lungs. It also has immunological role in gastrointestinal infections. Also goat milk has higher content of medium chain fatty acids which are easy for digestion and used as medicine for malabsorption syndrome and steatorrhea.

Modern science describes that Mycobacterium tuberculosis does not produce the disease in all the persons, but produces primary tuberculosis. So they described some provoking factors like cigarette smoking, alcoholism, immune-suppressive agent and some diseases like leukemia, lymphoma etc. which may be responsible for the disease. Similarly, there are two type of nidana in pathogenesis of Rajayakshma:

a) Sannikrishta nidana which is the upasarga and this may be the infection of Mycobacterium tuberculosis.

b) Viprakrishta nidana is 4 typed sahasjanya, sandharanajanya, kshayajanya and vishamashanajanya. These may act like provoking factors responsible for the disease. Also, Trirupa, Shadrupa and Ekdashrupa lakshana of Rajayakshma have been correlated to signs and symptoms of pulmonary tuberculosis. Chikitsa for Rajayakshma rogi according to Ayurveda is Chhagaseva. Meaning of word Chhaga & Aja is Goat. Sushruta samhita, Chakra-datta, Vangasena, Yogratakarava have advocated the use of various products obtained from goat. The patients suffering from Kshaya i.e. synonym of Rajayakshma should stay in the company of goats in the same room, drinks goats milk, use ghrita prepared from goat's milk in the ahara. The room in which the patient and goats leave should be painted, and tiled with goat's faces and urine. In current study, literature review on goat milk is done.

**REVIEW OF GOAT MILK**

**Ayurveda texts:**

<table>
<thead>
<tr>
<th>SrN.</th>
<th>Text</th>
<th>Rasa</th>
<th>Virya</th>
<th>Vipaka</th>
<th>Dosha ghnata</th>
<th>Uses</th>
<th>Roga Ghnata</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Su. Sa.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Properties similar to cow milk, Dipaniya, Laghu, Sangrahi</td>
<td>Shosha, Kasa Shwasa, Raktapitta</td>
</tr>
<tr>
<td>3.</td>
<td>A. Hr.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Laghu</td>
<td>Shosha, Shwasa Jwara, Atisar, Raktapitta</td>
</tr>
<tr>
<td>5.</td>
<td>Yo. Ra.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Tridosha</td>
<td>Properties similar to cow milk, Vishesh dipana,</td>
<td>Kshaya, Arsha, Jwara</td>
</tr>
</tbody>
</table>

*www.iamj.in*
Grahi, Laghu
Atisara, Raktadosh Bhrama,
Kshaya, Kasa Arsha, Jwara Shwasa, Atisara, Trushna, Vatarakt Raktapitta

Properties similar to cow milk, Dipana, Laghu Sangrahi, Snigda, Mrudu, Balya Shukrala,
Kshaya, Kasa Jwara, Atisar, Rak-tapitta.

More potent than cow milk, Diet for weak person.
Sarva Vyadhi hara

Table No. 1: Properties of goat milk according to Ayurvedic literature.
Modern research papers:

<table>
<thead>
<tr>
<th>Sr. N</th>
<th>Drug</th>
<th>Journal/Article</th>
<th>Proved activity/ Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Goat Milk-Serum Amyloid A-3 Protein</td>
<td>International Conference on Antimicrobial Research (ICAR2010) Valladolid (Spain), 3-5 November 2010</td>
<td>1) Antimicrobial activity S. Aureus Enteropathogenic E. coli. 2) Gastrointestinal protection and immunological role</td>
</tr>
<tr>
<td>5.</td>
<td>Goat milk</td>
<td>Asian journal of animal sci-</td>
<td>Anti bacterial property:</td>
</tr>
</tbody>
</table>
6. Goat milk

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- Size of fat globules - less than 5 microns is 83% thus easy digestion.
- Higher values of Caprylic acid, capric acid, Medium chain triglyceride than cow milk which are used in treatment for Malabsorption syndrome, and Steatorrhea.

7. Goat milk


In vivo study - Animals with symptoms of malabsorption show more efficient absorption of calcium, phosphorus, iron, copper, zinc, magnesium and selenium from goat milk compared to cow milk.

Table No. 2: Properties of goat milk according to Modern research work.

**RESULTS AND DISCUSSION:**

- According to review of Ayurvedic literature, goat milk is beneficial in Kshaya, Shosha which are synonyms of Rajayaksha.
- Main symptom of rajayaksha is cough, breathlessness, and fever. Goat milk has efficacy on Kasa, shwasa and jwara. According to research work, goat milk causes inhibition in the spore germination of fungi Absidia corymbifera which affects lungs. Also, goat milk has anti bacterial and anti fungal properties. It has anti microbial activity against S. Aurius which causes diseases like pneumonia, UTI, sinusitis, infective endocarditis, osteomyelitis etc. which induce fever.
- According to Charaka samhita, Purisha rakshan is very important in case of rajayaksha rogi. Goat milk has efficacy on atisara. According to modern research, it has anti bacterial properties against E. coli, Vibrio cholerae, Salmonella typhi, klebsiella pneumoniea, Shigella dysenteriea which cause diarrhea and dysentery. It shows immunological role in gastrointestinal protection.
- In Rajayaksha rogi, samprapti (patho-physiology) starts with agnimandya (diminished digestive activity) and rasavaha strotas avarodha which causes kshaya of further dhatu. Goat milk has deepana, grahi, laghu, balya, shukrala properties which can cause samprapti bhanga. It has 83% fat globules which are less than 5 microns’ size. Thus it is easy for digestion. Also, it has higher values of Caprylic acid, capric acid, Medium chain triglyceride which are used in treatment for Malabsorption syndrome, and Steatorrhea. Animal study shows that absorption of micro nutrients is more efficient from goat milk in comparison with cow milk.
- It has properties similar to cow milk which is best amongst all milks according to Ayurveda.
CONCLUSION:

• Pulmonary tuberculosis is correlated with Rajayakshma.
• Ayurvedic literature review concludes that goat milk can break pathophysiology of Rajayakshma.
• Modern research papers support the properties of goat milk mentioned in ayurvedic texts.
• Thus, goat milk can be an effective medicine in Pulmonary tuberculosis patients.

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