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Antimicrobial Study of Agnitundi Vati w.s.r. to Typhoid Fever.  

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ABSTRACT  

Introduction: Ayurveda is a highly evolved and codified system of life and health science based on its own unique and original concept and fundamental principles. Typhoid fever is one of the most endemic diseases caused due to contaminated water. Approx. 12.5 million cases of typhoid fever occur each year worldwide. A high incidence of enteric fever correlates with poor sanitation and lack of access to clean drinking water. Agnitundi vati is one of the important rasayoga among them, which is used for fever, Ajirna, water born disease. Materials and methods: For present study three samples of Agnitundi vati (S1, S2, and S3), prepared by self with the reference mentioned in Bharat Bhaishya Ratnakar 1/98. For this study, two common pathogenic strains of bacteria S. Typhi (MTCC No.733), E.Coli (MTCC No.901) were used. The study was carried out at “Channabasweshwar Pharmacy College”, Latur-413512. Here ‘Disc diffusion method’ was employed and for this study Dimethyl sulfoxide solvent was used. For this study 1 gm sample in 100 ml DMSO solution concentration was used and thus three concentration 50 mg/ml, 100 mg/ml, 125 mg/ml were taken. Streptomycin was used as standard. Results: As a statistical analysis all three samples of ‘Agnitundi vati’ have highly sensitive result on S. Typhi and E.Coli. A detail of antimicrobial study and data was presented in paper. Discussion and conclusion: Agnitundi vati was prepared by following the method mentioned in Bharat Bhaishya Ratnakar 1/98. Agnitundi vati was highly sensitive to Salmonella typhi and E.Coli.  

Keywords: Agnitundi vati, Antimicrobial study, Typhoid fever.  

1. INTRODUCTION  

Now a day’s infectious disease makes a trouble for human being. In order to avoid different infections, there are lots of antibiotics which derived from the microbial sources in synthetic manner. However, all synthetic antimicrobial agent are local irritants and are responsible for hypersensitivity reactions. Second important thing is that antibiotics from microbial sources have become ineffective and the infectious organism develops resistance against them. Thus, the idea of less intrusive alternative is alluring due to problem like adverse effect; limited life span & drug resistance. It is because of this reason the people are looking towards a safe and effective drug.

The Ayurvedic system is having its pride in providing such a therapy to address all these types of infectious diseases. While mentioning the treatment of Jwara in Ayurvedic classics various herbomineral and herbal preparations were mentioned.1 Out of which from Bharat Bhaishajya Ratnakar Agnitundi vati2 has been

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selected for present Research work.

There are a good number of medicines available in Ayurveda for various diseases, but till now efforts have not been made to specifically find out what medicines should be used for what condition. In this perspective, Microbiology can do a lot in research field of Ayurvedic medicine, which is still unexplored. It is now essential to confirm the action of drug on particular pathogenic micro-organisms by microbiological techniques so as to make our treatment scientifically more validated. This research work could be a small step towards this goal.

2. MATERIALS AND METHODS

2.1 Objectives of the Study

To study the Antimicrobial activity of Agnitundi vati against common pathogenic bacteria (Salmonella typhi and Escherichia coli).

2.2 Materials

For the present study Agnitundi vati which is a combination of Sudha Parad, Shudhda Vatsanabha (Aconitum Ferox)\(^3\), Sudha gandhak, Ajamoda(Carum Roxburghianum), Trishala (Terminalia Chebula, Terminalia Bellirica, Emblica Officinalis), Sajjikshar, Yavkshar, Chitrak (Plumbago Zeylanica), Siddhav, Jirak (Cuminum cyminum), Sauvarchal, Vidang (Embelia ribes), Samudralavan, Tankan, was prepared with specification mentioned in Bharat Bhaishajya Ratnakar and used for further antimicrobial study. This Study was done at “Channabasweshwar Pharmacy College” Latur-413512.

For present study three samples of Agnitundi vati (S\(_1\), S\(_2\), and S\(_3\)) was taken. After then each sample of Agnitundi vati, three different concentration solution 5\%, 10\%, 12.5\% (1gm sample was mixed in 100 ml DMSO\(^2\) for 1% Solution) was prepared with solvent dimethyl sulfoxide (DMSO). For the antimicrobial study of ‘Agnitundi vati’ Streptomycin was used as standard.\(^4\)

2.2.1. Micro-organisms

Micro-organisms selected for the present research work were those which cause general infections along with fever\(^6\). The pathogenic strains of different species of bacteria used for study were maintained on the media as mentioned in table 1.

2.2.2. Preparation of Media Plates:

Sterilization of culture media was done by autoclaving at 15 lbs. pressure for 20 minutes. Then media was taken out and then poured into glass petri dishes, in laminar flow cabinet. About 30 ml of media to be poured into each petri dish. The plates were left undisturbed until the agar solidified. Then the plates were kept at room temperature for overnight for observation of contamination. If contamination was there, the plates were discarded. If not contaminated, these plates were wrapped in a foil and kept in cold room at 4\(^0\)C for further use.

2.3. Evaluation of antimicrobial study

The study was done by “Disk diffusion method”.

2.4. Disk diffusion method

In this method 100ml of test bacterial subculture was prepared in sterile broth medium. After then prepared medium was spread on media plates. It was allowed to dry for 30 minutes and then four holes (each 3 mm diameter) was made in each media plates by using a sterile borer in suitable distance. Total 6 media plates (3 x 2) were prepared for study.

In each media plate 3 holes was filled by three different concentration solution of Agnitundi vati and one hole was filled by same concentration solution of streptomycin (standard). The samples and the control (0.1ml) were places in 3-mm diameter well.

The plates were incubated at 37\(^0\)C for 24 hours and after then diameter of the inhibition zone was measured by scientific scale and obtained observations were documented.

3. OBSERVATION AND RESULTS
The zone of inhibition of bacteria growth around the discs was measured in cm. with the help of a scale. The readings were taken at 4 different planes as shown in figure 1, 2, 3. From table no. 2 it can be said that S. Typhi was moderately sensitive to all three samples of Agnitundi Vati at 100 mg/ml concentration. While it was highly sensitive to the three samples of Agnitundi vati at 125 mg/ml concentration.

S. Typhi was was highly sensitive to Standard Streptomycin at 125 mg/ml concentration. E. Coli was moderately sensitive to all three samples of Agnitundi Vati at 100 mg/ml concentration. While it was highly sensitive to the three samples of Agnitundi vati at 125 mg/ml concentration. (Table 3).

4. DISCUSSION

Since, no documented study is found mentioned in Ayurveda regarding antibacterial activity, basic microbiological techniques mentioned for evaluating antibacterial activity in the modern medicine were followed. For this study, two common pathogenic strains of bacteria S. Typhi (MTCC No.733), E. Coli (MTCC No.901) were used. We have not included representative strains from pathogenic yeast, fungi and protozoa in our study because of difficulty in procurement. In figure 1, 2, 3 the incubation zone of all samples including standard was shown.

All three samples show moderate incubation zone against S. Typhi and E. coli. Agnitundi vati contains Shuddha Parada and Gandhaka which were used in the management of various chronic as well as sannipatik diseases since ancient times. Also the constituents like Vidanga(Embelia ribes), Triphala( Terminalia Chebula, Terminalia Bellirica, Emblica Officinalis), Vatsanabha(Aconitum Ferox) works as best krumighna. Vatsanabha is herbal drug with Yogvahi property and included in Vrisha dravya. As visha dravya has aashukari and yogvahi property which helps in sukshma stotamvita and resulting in sampraptivighatana. Other drugs in Agnitundi vati like Saindhav, Sajjikshar, Yavashar, Jirak, Ajamoda have Deepana, Pachana property. In Jwara it works by Aamapachana.

From graph 1 it can be said that sample 1, 2, 3, & standard having zone of inhibition in 50 mg/ml concentration was respectively 0.39, 0.35, 0.41, 0.6, and for 100 mg/ml concentration 0.46,0.56,0.66,0.86 respectively and for 125 mg/ml concentration 0.66, 0.77, 0.86 and 2 respectively. Thus, from above results it can be said that S. Typhi is highly sensitive to all three samples of Agnitundi vati at 125mg/ml concentration.

From graph 2 it can be said that sample 1, 2, 3 and standard having zone of inhibition in 50 mg/ml concentration was 0.5, 0.43, 0.33 and 0.7 respectively & for 100 mg/ml concentration 0.66, 0.6, 0.43 and 0.96 respectively and that for 125 mg/ml concentration 0.80, 0.9, 0.77 and 1.2 respectively.

Thus, from above results it can be said that E. coli is highly sensitive to all three samples of Agnitundi vati at 125mg/ml concentration.

5. CONCLUSON

♦ The powdered trial drug samples as such (Disk Diffusion method) are effective against Salmonella typhi and E. Coli.
♦ Agnitundi vati is highly sensitive to Salmonella typhi.
♦ Agnitundi vati is highly sensitive to E. Coli.

6. REFERENCES

2. Mahavir Ayurvedic Shrukhala 1 Editor(S), (Reprint 1999 Ed.). Bharat Bhaishajya Ratnakar Of Nagindas Chaganlal Shaha Rasavaidya, Pratham Sthana; Akaradi Gui-
6. TABLES AND FIGURES

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Species</th>
<th>MTCC No.</th>
<th>Media Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Salmonella typhi</td>
<td>733</td>
<td>Nutrient Agar</td>
</tr>
<tr>
<td>2.</td>
<td>Escherichia coli</td>
<td>901</td>
<td>Nutrient Agar</td>
</tr>
</tbody>
</table>

Table No. 1 Showing bacterial strain with their MTCC No.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Samples</th>
<th>Zone of Inhibition (cm.) in Different Concentrations (mg/ml)</th>
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<td></td>
<td>50</td>
</tr>
<tr>
<td>1.</td>
<td>S₁</td>
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</tr>
<tr>
<td>2.</td>
<td>S₂</td>
<td>0.35</td>
</tr>
<tr>
<td>3.</td>
<td>S₃</td>
<td>0.41</td>
</tr>
<tr>
<td>4.</td>
<td>Standard</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Table No.2 Shows Antibacterial activity of *Agnitundi vati* on S. Typhi

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Samples</th>
<th>Zone of Inhibition (cm.) in Different Concentrations (mg/ml)</th>
</tr>
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<tr>
<td></td>
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<tr>
<td>1.</td>
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<tr>
<td>2.</td>
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</tr>
<tr>
<td>3.</td>
<td>S₃</td>
<td>0.33</td>
</tr>
<tr>
<td>4.</td>
<td>Standard</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Table No. 3 Shows Antibacterial activity of *Agnitundi vati* on E. coli
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Graph 1 Showing result of ‘Agnitundi vati’ on S. Typhi.

Graph 2 Showing result of ‘Agnitundi vati’ on E. Coli.

Sample 1 S. Typhi

Sample 1 E. Coli
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