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Research Article

MONITORING THE MEDIA PH VALUE IN THE MIXTURE OF JUICE OF CITRUS AURANTIUM IN SYNTHETICALLY PREPARED GASTRIC JUICE: AN EXPERIMENTAL STUDY

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ABSTRACT

According to Sri Lankan Ayurveda pharmacopeia, indication of Juice of Abuldodam (Citrus aurantium) in afternoon or evening is a good treatment for Amla pitta. According to Ayurveda Citrus aurantium is sour (Amla rasa) in taste, Amlavipaka, Guru Guna and Ushnaveerya. It is Kapha-Vathashamaka, Rochana, Deepana and Anulomana in Anna Pachanavyuha (GIT). Citric acid, pectin, lemon oil and carotene etc. are the main chemical compounds of Citrus aurantium. Common attitude is that most probably acidic fruits may be a cause for increasing the acid condition in the stomach. Society disagrees to use the juice of Citrus aurantium as a treatment of Amlapitta. But some Ayurveda and Traditional physicians have been used the juice of Citrus aurantium in the management of Amlapitta. Gastric acid is the digestive fluid, formed in the which shows of 1.5 to 3.5 and is composed of (HCl) (around 0.5%, or 5000 ppm). Gastric juice is a strong acid (as high as 0.1 M) usually secreted by the glands in the lining of the stomach and usually essential for the digestion. The amount of gastric juice in the stomach will vary from person to person. In the study, gastric juice was prepared in synthetically at the level of normal pH value in stomach following standard procedure. 10 samples of gastric juice were arranged in various pH values (0.86-13.11). 25ml of juice of Citrus aurantium was mixed into each sample. The pH value was measured with the temperature in three durations, on time, after 5 minutes and after 10 minutes. The P values were measured with standard software. The founded P value is 0.955 at 95% confidence level. It can be concluded that there is no significant variation of the media pH value in the mixture of Juice of Citrus aurantium in synthetically prepared gastric juice.

KEYWORDS: Amlapitta, Citrus aurantium, Gastric juice, pH value.

INTRODUCTION

Ayurveda medical system is a one of great medical system which can cure and prevent many diseases of humans in world wide. Not only by Ayurveda but also the indigenous treatment system in Sri Lanka can cure and prevent many diseases by use herbal medicine. In addition, Sri Lankan since ancient times is used to consume many different parts of herbal plants such as barks, roots, flowers, leaves and fruits as food. So they have a resistance to some diseases within body itself. According to Ayurveda it can cure and prevent many diseases without any side effect by using herbal drugs such as leaves, roots, barks, fruits, nuts etc.

Amla pitta is a common disease in present society. The main reasons are foods, medicine, habits from human beings. They are fried foods, chili foods, busy life style, psychological problems, stress, side effects of drugs etc. There are many Ayurveda and western treatments for Amla pitta in present society. People use them according to their choice and attitudes. According to Ayurveda Amla pitta is a kind of disease, the patient who sense Amlarasa to the mouth. In the Allopathic medicine Amla pitta is similar to Gastritis. The gastric juice burn the epithelium cell layer of the stomach and create inflammation condition in the stomach. According to Ayurveda Pachaka pitta and According to western Science Hcl gives acidity condition to gastric juice.

Some Ayurveda books are mentioned that Abuldodam (Citrus aurantium) juice give in afternoon or evening is a good treatment for Amla pitta. It is curious reason, because According to Ayurveda Abuldodam (Citrus aurantium) has Amlarasa, Amlavipaka, Guru Guna, Ushnaveerya. Dosarupakarmas are Kapha Vathashamaka. Rochana, Deepana, Anulomana are the activities in Anna pachanavyuha. Citric acid, pectin, lemon oil, carotene are the main chemical compounds of Abuldodam[1]

It will increase acid contain in the stomach. Due to that reason Amla pitta condition will incise. Most of people disagree to use Abuldodam (Citrus aurantium). But some Ayurveda and Desheeya doctors used Abuldodam juice for Amlapitta. Citrus aurantium belong to Rutaceae family. Small tree to 10m tall with large spines on younger branches.

Importance of research

Amla pitta is a disease what can increase due to people’s careless life style. According to the Ayurveda it
mentioned as Prachchaparada. It is a disease can cure in primary condition Amla pitta. But it got worse it can only controlled. According to the Ayurveda these are two type of treatment method.

  1. Prevent the disease
  2. Treat to disease

Among these methods prevention is the most important to this society.

Abuldhodam (Citrus aurantium) is a common plant in Sri Lanka. Due to that reason all the people can get benefit of anti-gastritis activity of juice of Abuldhodam (Citrus aurantium). It is simple and easy to prepare and it is tasty drink. Because it can easy to use children. I think this is important to prevent the disease.

Hyperacidity or acid dyspepsia simply means increase of acidity in the stomach. The human stomach secretes hydrochloric acid which is necessary for the digestion of food. When the stomach contains an excessive amount of hydrochloric acid, then the condition is called as hyperacidity or acid dyspepsia. Sometimes, hyperacidity is confused for a simple bellyache. This is because people with hyperacidity usually generally get pains in their stomachs with similar symptoms as bellyaches. This confusion is more rampant in children who cannot differentiate between different kinds of stomach ailments. However, hyperacidity can be found out with the sour belching and aftertaste of the already eaten food in the mouth.

The prime medical factors of hyperacidity or acid dyspepsia are as follows

Stomach Ulcers: Ulcers in the stomach are one of the prime causes of hyperacidity. Once this is diagnosed, the treatment will be done by the surgical removal of the stomach ulcers.

Acid Reflux Disease: Some people have a gastric disorder called as the acid reflux disease. In this condition, the acids of the stomach, i.e. gastric acids or hydrochloric acid, get refluxed up to the food pipe, which is biologically.

Abuldhodam (Citrus aurantium) has citric acid and it is taste of acid (Amla rasa). because of that reason they think acid condition will increase getting juice of Abuldhodam.

But some Ayurveda books and practitioners are using juice of Abuldhodam (Citrus aurantium) in evening time to Amlapitta condition. It must be has anti-gastritis activity.

Plant of Citrus aurantium (Rutaceae)

Eng: sour orange
Sans: Jambira
Sin: Abuldhodam
Tam: Naranga
Hin: Khata

Panchapadartha
Rasa: Amla
Guna: Guru
Veerya: Sheetha
Vipaka: Amla

Description
Small tree to 10m tall with large spines on younger branches. Leaves alternate with winged-petioles, the blade ovate, bluntly toothed. Emitting a strong citrus odor to the presence of copious oil glands. Flowers axillary borne singly to numerous seed within. Flowers usually during warmer months and fruit available later in year.

Habitat
Cultivated and possibly naturalized in some location.

Part used: Leaves, Barks and fruits.

Chemical constituents
Dipentine, Linalol, Citral, Limonene, Flavonoids, Vitamins A, B, C, Citric acid, Pectine, Fatty oil.

Method
Preparation of juice of Citrus aurantium
The juice extracted from a fresh green drug by pounding it and squeezing through cloth is called Swarasa.[2]

Prepare synthetic gastric juice in normal value of pH in stomach.

Preparation of Synthetic Gastric Juice

- Dissolve 5 g pepsin, 8.75 g conc’ hydrochloric acid, and 10 g of lactic acid in 500 mL of DI water
- Dilute to 1 L and stir gently to avoid foaming.[3]
- Method of preparation 8.75 g conc’ hydrochloric acid
- $\rho \text{HCl} = \text{spec} \text{al gravity of Hcl } \times \text{pH2O}$
  \[\frac{1.18 \times 0.999 \text{ gcm}^{-2}}{}\]
  \[1.178 \text{ gcm}^{-2}\]

\[V = \frac{m}{\rho} = 8.75g/1.178 \text{ gcm} – 2 = 7.42ml \text{ (Volume adding Hcl sg-1.18)}\]

Prepare 10 samples of gastric juice in various pH value. Adding small amount as drops of Hcl in sg-1.18 as drops

Then measure the pH value with temperature.

<table>
<thead>
<tr>
<th>Sample (25ml) No</th>
<th>Temperature</th>
<th>pH value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29.1</td>
<td>0.86</td>
</tr>
<tr>
<td>2</td>
<td>28.7</td>
<td>1.04</td>
</tr>
<tr>
<td>3</td>
<td>29.4</td>
<td>1.15</td>
</tr>
<tr>
<td>4</td>
<td>29.1</td>
<td>1.32</td>
</tr>
<tr>
<td>5</td>
<td>29.4</td>
<td>1.52</td>
</tr>
<tr>
<td>6</td>
<td>29.2</td>
<td>1.75</td>
</tr>
<tr>
<td>7</td>
<td>29.4</td>
<td>1.94</td>
</tr>
<tr>
<td>8</td>
<td>29.0</td>
<td>2.54</td>
</tr>
<tr>
<td>9</td>
<td>29.4</td>
<td>3.2</td>
</tr>
<tr>
<td>10</td>
<td>29.4</td>
<td>13.11</td>
</tr>
</tbody>
</table>
Mix 25ml of juice of Abuldhodam (Citrus aurantium) for each sample

Then measure the pH value with temperature

On time, After 5 minutes, After 10 minutes

At last measure the P value with temperature

**Results**

<table>
<thead>
<tr>
<th>pH values</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.2/13.11</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>29.4/3.2</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>29.0/2.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.4/1.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.2/1.75</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.4/1.52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>29.1/1.32</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>29.4/1.15</td>
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<tr>
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</tr>
<tr>
<td>29.1/0.86</td>
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</tbody>
</table>

**CONCLUSION**

The founded P value is 0.955 at 95% confidence level. It can be concluded that there is no significant variation of the media pH value in the mixture of Juice of Citrus aurantium in synthetically prepared gastric juice

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