Formulation and Evaluation of Tea Bags Containing Herbal Drugs for Treatment of Urolithiasis
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Abstract:
Kidney is two bean shaped large structures that help to remove waste from blood as urine. The kidney stone is urinary tract related worldwide diseases. Dietary factor like low fluid intake, increased salt in diet are risk factors for kidney stones. The tea bags containing herbal formulation on kidney stone is best treatment for urolithiasis as it increases patient compliance. The main objective of these formulation is prepare fresh formulation during each dose, To mask the bitter taste of drugs. and prepare effective dosage form for treatment of urolithiasis.

Keywords: Tea bag, Herbal formulation, Kidney Stone, Fresh formulation.

I. INTRODUCTION
The kidneys play important role in maintaining the balance of body fluid and regulating blood pressure. And it carry out function of removing waste product from body. The right kidney is slightly smaller than left kidney. The kidneys are placed at back of abdominal cavity.

A) RISK FACTORS1-
1 Diabetes
2 smoking
3 Heart disease
4 male sex
5 Drug abuse
6 obesity
7 age
8 Family history of kidney disease

II. PATHOPHYSIOLOGY OF KIDNEY STONE FORMATION2:-
A) Nucleation
Nucleation is the formation of a solid crystal phase in a solution. The stone formation starts from nuclei, which means the process of new crystal formation. It is an essential step in renal stone formation the term super saturation refers to solution that contains more of the dissolved material that could be dissolved by solvent under normal circumstances.

B) Crystal growth
Several atoms or molecules in a supersaturated liquid start forming clusters. The total free energy of cluster is increased by free energy. Crystal growth is determined by molecular size and shape of molecule, the physical properties of a material, the physical properties of a materials, PH, and defects formed in crystal structure.

C) Aggregation
Aggregation is process in which crystal nuclei bind to each other to form large particles. The initial nuclei can grow by further addition of desired salts. A small inter-particle distance increases the attractive force and privileges particle aggregation.

D) Retention
Crystal retention can be increased by the association of crystal with the epithelial cell lining. Urolithiasis require formation of crystal followed by their retention and accumulation in kidney.

E) TYPES OF KIDNEY STONE3:

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Types of Kidney Stone</th>
<th>formation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Calcium Oxalate</td>
<td>Formed by combining calcium with oxalic acid.</td>
</tr>
<tr>
<td>2</td>
<td>Calcium phosphate</td>
<td>Formed by combining calcium atom with phosphoric acid.</td>
</tr>
<tr>
<td>3</td>
<td>Uric acid stone</td>
<td>Formed by much more uric acid in urine.</td>
</tr>
<tr>
<td>4</td>
<td>Struvite</td>
<td>Formed by urine containing urea break it to ammonia.</td>
</tr>
<tr>
<td>5</td>
<td>Cysteine</td>
<td>Formed due to cystinuria, an inherited disorder.</td>
</tr>
</tbody>
</table>

III. OBJECTIVES OF FORMULATIONS:
• To prepare effective dosage form for treatment of urolithiasis.
• To prepare fresh formulation during each dose.
• To mask the bitter taste of some drugs for treatment of urolithiasis.

IV. MATERIALS AND MEATHOD4:
Method
Procedure
All the plant materials were dried and finely powdered. The finely powdered raw material were passed through sieve number
40 and 1 gm of the individual drugs were weighed and mixed fennel and sugar was added to enhance the flavor and taste respectively. Powder mixture of 1 gm weight was packed in tea bags.

<table>
<thead>
<tr>
<th>StNo</th>
<th>Ingredients</th>
<th>Quantity given</th>
<th>Quantity taken</th>
<th>category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gokhru⁵</td>
<td>1gm</td>
<td>10gm</td>
<td>Antiurolithic</td>
</tr>
<tr>
<td>2</td>
<td>Tulsi⁶</td>
<td>3gm</td>
<td>30gm</td>
<td>Blood purifier, Antimicrobial</td>
</tr>
<tr>
<td>3</td>
<td>Sursa⁷</td>
<td>2gm</td>
<td>20gm</td>
<td>Diuretic</td>
</tr>
<tr>
<td>4</td>
<td>Punamava⁸</td>
<td>1gm</td>
<td>10gm</td>
<td>antiurolithic</td>
</tr>
<tr>
<td>5</td>
<td>Chitrak⁹</td>
<td>0.4gm</td>
<td>4gm</td>
<td>antiurolithic</td>
</tr>
<tr>
<td>6</td>
<td>Fennel¹⁰</td>
<td>1.6gm</td>
<td>16gm</td>
<td>Flavouing agent</td>
</tr>
<tr>
<td>7</td>
<td>Sugar</td>
<td>1gm</td>
<td>10gm</td>
<td>Sweetening agent</td>
</tr>
</tbody>
</table>

**Table 2. Formula**

**Figure 1. Tea bag containing Formulation**

**V. EVALUATION TEST:**

A) **LOSS ON DRYING (LOD Test)**

Weight the empty petri dish take 2gm of powder sample into it place these petri dish in hot air oven for 1hour and calculate weight of petri dish frequently. repeat the same procedure until weight of petri dish become equal note down constant reading of loss on drying of herbal formulation on kidney stone.

B) **Water Soluble extractive value:**

Take 5gm of powder sample of herbal drug mixture in a conical flask add 100 ml of alcohol into it keep it for magnetic stirring for 6 hours then place it for 18 hours filter it and take 25 ml of filtrate from that evaporate it.

C) **Alcohol Soluble extractive value.**

Take 5gm of powder sample of herbal drug mixture in a conical flask add 100 ml of alcohol into it keep it for magnetic stirring for 6 hours then place it for 18 hours filter it and take 25 ml of filtrate from that evaporate it.

D) **Ash value**

Weigh the empty crucible add 2 gm of herbal formulation weigh the crucible place the crucible in a muffle furnace at 10000 c. the sample allow to cool and calculate the weight of crucible subtract the weight of crucible with powder ash from empty weight of crucible.

E) **PH = 5.3**

Take few gram of sample in a beaker add few ml of water in it calculate pH of sample by using pH paper.

F) **Bulk density:**

Bulk density is defined as the mass of powder divided by bulk volume. the bulk density of a powder depend upon particle size distribution, particle shape, and the nature of particle to adhere to each other.

\[
LBD = \frac{WEIGHT\ OF\ POWDER}{VOLUME\ OF\ PACKING}
\]

\[
TBD = \frac{WEIGHT\ OF\ POWDER}{TAPPED\ VOLUME\ OF\ A\ PACKING}
\]

Where TBD is the tapped density and LBD is the loose bulk density.
G) Tapped density: -
It is calculated by tapping bulk volume of powder for 15 minutes.
Tapped density = weight of sample/tapped volume

H) HAUSNER RATIO:
Housner’s ratio of the powder was determined by following formula

HOUSNER’S RATIO = Tapped density/Bulk density.

I) Percent compress ability:
Constant compressibility of a powder mixture was determined by carr’s compressibility index calculated by formula

Carr’s index = TBD – LBD / TBD × 100

J) In vitro studies
Inhibition of kidney stone crystallization
All the chemicals used are of AR Grade crystalloid forming solution viz solution of calcium acetate and sodium oxalate (for calcium oxalate) and inhibitor solutions. aqueous extract of cystone (a marketed herbal formulation for urolithiasis) was prepared by grinding tablets to powder mixed with 50 ml water and kept for 2 to 3 hours and then centrifuged at 1000 rpm in centrifuging machine (Remi equipment, Bombay) clear supernatant was used for study. the extract of plant compared with aqueous extract of cystone for antilithiatic activity whole amount of inhibitor solution placed in a beaker in beginning itself and two salt forming solution are allowed to run drop wise through burette thus reservoir of the inhibitor was created into which salt forming solution run down thus reservoir of the inhibitor was created into which salt forming solution run down at the end the solution was heated on scientific instrument for 10 minutes cooled to room temperature and the precipitate was collected in pre weighing centrifuge tube by centrifuging (Remi equipment, Bombay) small volume at a time and rejecting the supernatant liquid. next the tube with precipitate dried in hot air oven (ambassador) cool to room temperature and weighed till constant weight using weighing balance weight of precipitate was determined simultaneous blank experiment with water in place of inhibitor compared with water all the experiment conducted at room temperature. data were expressed as mean values of three independent experiment as mean STDEV Percentage efficacy of inhibitor was calculated by using formula

PRECENTAGE INHIBITION = (weight of precipitate in blank set-weight of precipitate in experimental set/weight of precipitate in blank set) × 100

VI. RESULT

Table 3. Result of Evaluation test

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Evaluation Test</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loss on Drying</td>
<td>49.175%</td>
</tr>
<tr>
<td>2</td>
<td>Water soluble Extractive Value</td>
<td>5.0%</td>
</tr>
<tr>
<td>3</td>
<td>Alcohol Soluble Extractive value</td>
<td>5.6%</td>
</tr>
<tr>
<td>4</td>
<td>Ash Value</td>
<td>1.596</td>
</tr>
<tr>
<td>5</td>
<td>pH</td>
<td>5.3</td>
</tr>
<tr>
<td>6</td>
<td>Bulk Density</td>
<td>0.29</td>
</tr>
<tr>
<td>7</td>
<td>Tapped Density</td>
<td>0.36</td>
</tr>
<tr>
<td>8</td>
<td>Carr’s Index</td>
<td>17.14</td>
</tr>
<tr>
<td>9</td>
<td>Hausner’s Ratio</td>
<td>1.21</td>
</tr>
<tr>
<td>10</td>
<td>Inhibition of kidney stone crystallization</td>
<td>39%</td>
</tr>
</tbody>
</table>

VII. ACKNOWLEDGEMENT:
The authors are grateful to authorities of A.S.P.M’s K.T. Patil College of Pharmacy, Osmanabad for their facilities.

VIII. CONCLUSION
The dosage form (Tea bag containing antiurolithiatic drug) was prepared and evaluated and found to be effective for desired activity. The kidney stones of various etiologies were found in inclined state in community, which suggest the need of effective drug compounded in suitable dosage form with antiurothiatic activity. The effectiveness and quality of prepared dosage form was evaluated. The formulation shows 5% water soluble extractive value. Other required parameters like alcohol soluble extractive value, Ash value, pH Hausners ratio were studied and
value was found to be in prescribed range. The drug formulated in tea bag shows effective inhibition of kidney stone (about 39%) inhibition.

**IX. REFERENCES**


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