Herbal formulations for jaundice treatment in Jamalpur district, Bangladesh

Khoshnur Jannat, Nasrin Akter Shova, MM Maidul Islam, Rownak Jahan and Mohammed Rahmatullah

Abstract
Jaundice is a condition where levels of bilirubin in blood goes above normal levels due to disorders of the liver. This condition is characterized by yellow tinge of skin and the eyes. Since jaundice can be a manifestation of serious hepatic disorders like cirrhosis or hepatitis, it is important that jaundice be taken care of and liver brought to its normal state in a short period of time. Rural people of Bangladesh mostly rely on folk medicinal practitioners for treatment of diseases. We here present two plant-based formulations administered by a practitioner in Jamalpur district of Bangladesh for treatment of jaundice, and discuss the scientific evidence and relevancy of the plants used by the practitioner as hepatoprotective agents and their possible therapeutic efficacy against jaundice.

Keywords: Folk medicine, phytotherapy, jaundice, Jamalpur, Bangladesh

Introduction
Since primitive time people have been using natural products, mainly plants to attenuate or treat diseases [1]. According to the World Health Organization (WHO), people are turning to traditional medicine (TM) worldwide because of its availability and affordability. People who have been suffering from chronic diseases are also moving towards TM as they are now more and more shown to be scientifically validated in their uses [2]. Usually the knowledge of this practice is transferred in different generation orally [3]. Among TM, folk medicinal practice in Bangladesh is quite popular and is considered as primary level treatment [4]. Generally people who practices folk medicine are Kavirajes among the mainstream population and tribal practitioners among the tribal communities who generally possess good knowledge about the phytotherapeutic effectiveness of plants [5-9]. The word jaundice originates from the French word jaune meaning yellow. Jaundice mainly can be defined as high bilirubin level in the body. Symptoms of jaundice are manifested by yellowing of skin, mucous membranes, and sclera because a yellow-orange bile pigment bilirubin deposits in blood, which is produced from breakdown of heme rings [10, 11]. Jaundice only can occur when serum bilirubin level exceeds 3 mg per dL, which happens due to disruption in bilirubin metabolic pathway. Increased red blood cell destruction causes increase in unconjugated bilirubin and hepatocellular damage or biliary tract obstructions cause increases in conjugated bilirubin [12].

A recent survey done in five rural communities of Bangladesh with 125,570 population showed that 60 persons over the age of 14 die due to jaundice and a mother who was suffering from jaundice for 3 years gave four stillbirths [13]. From the data it can be estimated the rate of death or surviving patient associated with jaundice. Jaundice itself cannot be cured but its symptoms and causing factors can be. Generally in Bangladesh, people use home remedies to reduce the symptoms of jaundice. Kavirajes and different communities of people also use different plants against jaundice. Some plants used against jaundice in Bangladesh are shown in Table 1. Since medical science always tries to find better medications for treatment, the objective of this study was to document folk remedies against jaundice in Jamalpur district of Bangladesh.

Materials and Methods
The survey was done by interviewing a folk medicine practitioner (FMP), Md. Mostafizur Rahman, aged 42, in Pashchim Nayapara area, Jamalpur district, Bangladesh.

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Information was collected with the help of a semi-structured questionnaire and the guided field-walk method of Martin [24] and Maundu [25]. In this method the FMP gave two formulas of two different plants for the treatment of jaundice. The FMP took the interviewers to the location to acquaint them with the plants. Plant specimens were then collected and preserved for Herbarium identification by pressing and drying them in the field.

**Result and Discussion**

The FMP supplied two plant formulations containing as the main ingredient plants, *Azadirachta indica* A. Juss. (Meliaceae) and *Leucas aspera* (Willd.) Linn. (Lamiaceae). The plants are known as neem and domkolosha, respectively in Bengali (local language). The first formulation was made by using the plant’s bark and honey. Bark of *A. indica* was crushed for collecting the juice. Fifty grams of the juice were then mixed with equal amount of honey. The mixture was advised to be taken orally once daily on an empty stomach for 3-4 days.

The second formulation was prepared by taking a handful of leaves of *L. aspera*, which were then crushed to collect juice. Juice was then advised to be applied to eyes 3-4 times a day until cure.

*Azadirachta indica* A. Juss, is a medicinal plant widely used by FMPs in Bangladesh for its effectiveness against diverse diseases including pain [26], gastrointestinal disorders, malaria fever, diabetes, insect repellent, and skin diseases [27]. The plant possesses numerous phytochemicals like nimbolinin, nimbin, nimbidin, quercetin, azadirachtin, nimboline, ascorbic acid, 17-hydroxyazadiradione, n-hexacosanol, which have been found to be effective against various diseases. The main active compound azadirachtin is toxic for insects; two of the plant limonoids, azadirachtin and nimbolide reportedly showed significant result in lessening serum bilirubin level [28], which may lead to the discovery of new drug(s) for the treatment of jaundice. As *A. indica* extract has the ability to reduce bilirubin level, further investigations may elucidate the mechanism and there can be a finding of a lead compound.

Jaundice is a serious problem in Bangladesh. One in five maternal deaths in Bangladesh is associated with acute jaundice [33]. Outbreaks of hepatitis E (which can cause jaundice) have been reported for Bangladesh [36]. As a result, low-cost therapy in the form of phytotherapy (provided the plants have been scientifically validated to alleviate jaundice) may prove to be the best answer for the rural low-income people of Bangladesh, who lack access to modern hospitals and doctors. Such approaches are increasingly in use also in other parts of the world [37, 38].

### Table 1: Some plants used by folk medicinal practitioners of Bangladesh to treat jaundice.

<table>
<thead>
<tr>
<th>Scientific Name (Family Name)</th>
<th>Local Name</th>
<th>Part Used</th>
<th>Formulation and usage</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streblus asper Lour. (Moraceae)</td>
<td>Shaora gach</td>
<td>Leaf</td>
<td>Jaundice. Juice is taken orally.</td>
<td>[14]</td>
</tr>
<tr>
<td>Dioscorea belophylla</td>
<td>Khoia aloo</td>
<td>Leaf</td>
<td>Leaf juice is taken for jaundice.</td>
<td>[15]</td>
</tr>
<tr>
<td><em>Moringa oleifera</em> Lam. (Moringaceae)</td>
<td>Sajna</td>
<td>Leaf, Stem</td>
<td>Juice from leaf and stem are taken for jaundice.</td>
<td>[16]</td>
</tr>
<tr>
<td>Lagenaria siceraria (Cucurbitaceae)</td>
<td>Lau</td>
<td>Leaves, fruits, seeds, roots, stems</td>
<td>Jaundice. The various parts are consumed individually or in combination.</td>
<td>[17]</td>
</tr>
<tr>
<td>Kalanchoe pinnata (Crassulaceae)</td>
<td>Pathorkuchi</td>
<td>Leaf</td>
<td>For jaundice a handful of leaves of the plant are macerated. Juice is mixed with a banana and yogurt. Mixture is taken (125 ml twice daily for a week).</td>
<td>[18]</td>
</tr>
<tr>
<td>Vitis negundo L. (Verbenaceae)</td>
<td>Nishinda</td>
<td>Root</td>
<td>Juice of roots is taken in an empty stomach for jaundice.</td>
<td>[19]</td>
</tr>
<tr>
<td>Mimosa pudica L. (Fabaceae)</td>
<td>Lozzaboti</td>
<td>Stem</td>
<td>To treat jaundice, garland of stem of the plant is kept over the head.</td>
<td>[20]</td>
</tr>
<tr>
<td>Justicia adhatoda L. (Acanthaceae)</td>
<td>Bashok</td>
<td>Leaf</td>
<td>Leaf juice is orally taken for jaundice.</td>
<td>[21]</td>
</tr>
<tr>
<td>Averrhoa carambola L. (Oxalidaceae)</td>
<td>Kamranga</td>
<td>Fruit</td>
<td>Ripe fruits are eaten for jaundice.</td>
<td>[22]</td>
</tr>
<tr>
<td>Cajanus caajan (L.) (Fabaceae)</td>
<td>Arhar</td>
<td>Leaf</td>
<td>Leaf juice is taken orally for jaundice.</td>
<td>[23]</td>
</tr>
</tbody>
</table>
References


