



Short Communication

Medicinal Plants Used for Neonatal Jaundice in Shahrekord: An Ethnobotanical Study

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Abstract

Jaundice begins in the infants from the very early days of birth; the symptoms usually appear with yellow skin and sometimes eyes, jaundice first involves only the face, but it also affects the chest, abdomen, legs, and the soles of the feet and the lower limbs. In this ethnobotanical study, attempt was made to identify medicinal plants used in the herbal medicine of Shahrekord region to treat neonatal jaundice. This cross-sectional study was performed by collecting data through an ethnobotanical knowledge questionnaire from 21 April 2016 to 19 February 2017, through face-to-face interview with 29 traditional therapists. The results of the questionnaire were distributed among traditional therapists and information was obtained. The results showed that in the ethnobotany of Shahrekord, *Descurainia sophia* (L.) Webb ex Prantl, *Cichorium intybus* L., *Alyssum* spp. Stead. Ex Boiss., *Fumaria* spp., *Adiantum capillus-veneris* L., *Astragalus adscendens* (Boiss. & Hausskn.) Podlech, *Alcea* spp., *Vinifera* Spp. and *Rheum ribes* L. are used as anti-neonatal jaundice medicinal plants. The results shows that leaf (41%) is the most commonly used plant organ for jaundice in the studied region. According to the results of our ethnobotanical study, the plants reported in this study are traditionally used to prevent neonatal jaundice, and it is necessary to prove these effects in clinical and pharmacological studies.

Keywords: Pediatric Diseases, Jaundice, Ethnobotany, Shahrekord, Iran

Introduction

Jaundice is a common clinical problem in the neonatal period that is caused by the deposition of bilirubin in the skin and mucous membranes and can lead to brain damage [1]. Jaundice usually occurs in the first week of life, which is very common and usually leads to the admission of the newborn [1]. Jaundice begins in the infants from the very early days of birth; the symptoms usually appear with yellow skin and sometimes eyes; jaundice first involves only the face, but it also affects the chest, abdomen, legs, and the soles of the feet and the lower limbs. [2]. One of the diseases that sometimes seriously affects the

newborns and their parents is jaundice. Generally, most babies are affected by this condition within the early days of their lives, which indicates that it commonly occurs in infants, with an incidence rate of over 70% in preterm infants [3]. Jaundice in children appears with skin and eyes growing palor or yellow, which is due to the increase in the level of a yellowish substance called bilirubin in the blood, resulting in the accumulation of this substance under the skin and making it yellow. Most often, this palor and yellowness is continued up to the chest [4]. Pharmacological and non-pharmacological methods can cause hyperthermia,

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loose stool and bronze baby syndrome, but have complications such as retinal damage [5]. In the absence of early treatment, increased bilirubin can cause brain damage, physical impairment, and mental impairment and early onset of neonatal death [6]. In addition, neonatal jaundice is one of the diseases whose nature and treatment have long been discussed by the public, such as eating sugary water, scarifying the forehead or ears, bathing and administration of herbal drugs like cotoneaster [7]. Selective treatment for this condition in western medicine is blue light therapy and blood replacement is considered as the last way to reduce bilirubin in cases where jaundice does not respond to other treatments [8-16]. The most commonly used treatment for hyperbilirubinemia is the use of phototherapy which has many complications, including damage to the retina and retinal area, as well as dehydration, diarrhea, and tanned child syndrome. Therefore, there has always been a solution to reduce the time of phototherapy or substitution for this issue [17]. Other treatments that have recently been taken into consideration by researchers and approved by clinical trials are medicinal plants [17, 19]. Medicinal plants are used not only for the treatment of acute and chronic diseases, but also for the prevention and control of infectious and non-infectious diseases [20-31]. Ethnobotanical knowledge can provide ideas for modern pharmacology, and many medicinal plants whose effects have been reported in ethnobotanical knowledge have also been shown, in empirical pharmacology, to have impacts [32-36]. Medicinal plants' safety and few side effects have convinced many families to use these natural and traditional therapies to maintain their physical and mental health and to treat diseases and disorders that affect their babies in the first two years of life. Since the knowledge of herbal medicine, traditional healers if do not document they are destroyed with the death of their traditional knowledge, so the writing is very valuable and vital. These methods not only succeed in the treatment and relief of diseases but can also be effective to treat and relieve neonatal pains with the least side effects and without the need for modern and chemical drugs. In this ethnobotanical study, attempt was made to identify medicinal plants used in the herbal medicine of Shahrekord region to treat neonatal jaundice.

Material and Method

Data Collection Procedure

This cross-sectional study was carried out from 21 April 2016 to 19 February 2017 by using an ethnobotanical knowledge questionnaire administered to and face-to-face interview with 29 traditional therapists from Shahrekord region to investigate their indigenous knowledge regarding the anti-jaundice effects of medicinal plants. A questionnaire was distributed between traditional therapists. The questionnaires also included demographic information. The interviewers referred to the participants in person to record their pharmaceutical and ethnobotanical knowledge and their viewpoints regarding phytotherapy. Out of 29 people, 8 were female and 21 were male. Participants' education level was from high school diploma to master's degree. The results of the questionnaires were tabulated in the same way. Data were analyzed by the Excel software. The data in each section is entered into the Excel program. From 2-D Pie was used to report the percentage of plant use. The 2-D column method was also used to report the number of plant families. The frequency use of plants was calculated by the equation below: Number of times the plant is used = (Number of people who have mentioned the plant effect divided by total number of people who filled out questionnaires) \times 100

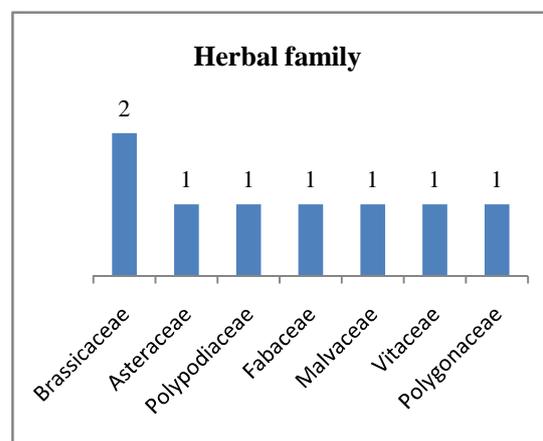
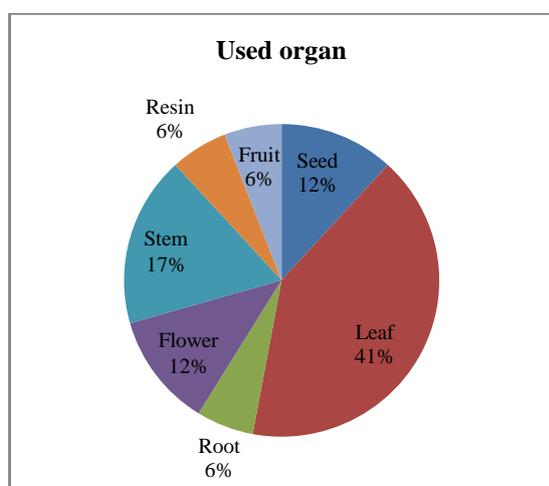


Fig. 1 The distribution of anti-jaundice plant families in the ethnobotanical study of Shahrekord

Fig. 1 shows that most species with anti-neonatal jaundice effect in Shahrekord belong to the Brassicaceae family. More information is illustrated in Fig. 1. Additionally, Fig. 2 shows that leaf (41%) is the most commonly used plant organ for jaundice in the studied region. Additional information is shown in Fig. 2.

Table 1 Scientific name, family, Persian name, used organ(s), and frequency of use of medicinal plants used as anti-jaundice agents in Shahrekord

Scientific name	Herbal family	Local name	Used organs	Frequency of rate	Therapeutic effect
<i>Descurainia sophia</i> (L.) Webb ex Prantl	Brassicaceae	Khakshir	Seed	%3	Jaundice
<i>Cichorium intybus</i> L.	Asteraceae	Kasni	Root, stem, leaf	%6	Jaundice
<i>Alyssum aizoides</i> Boiss.	Brassicaceae	Ghodoumeh	Leaf, seed	%3	Jaundice
<i>Fumaria officinalis</i> L.	Fumariaceae	Shatareh	Leaf	%6	Jaundice
<i>Adiantum capillus-veneris</i> L.	Polypodiaceae	Parsiavashan	Flower, stem, leaf	%3	Jaundice
<i>Astracantha adscendens</i> (Boiss. & Hausskn.) Podlech	Fabaceae	Gazangabin	Resin	%3	Jaundice
<i>Alcea acaulis</i> (Cav.) Alef.	Malvaceae	Gole khatmi	Flower, Leaf	%3	Jaundice
<i>Vitis vinifera</i> L.	Vitaceae	Angour	Fruit, leaf	%3	Jaundice
<i>Rheum ribes</i> L.	Polygonaceae	Rivas	Leaf, stem	%3	Jaundice

**Fig. 2** The percentage of the use of plants organs with anti-jaundice effect

Discussion

Jaundice begins in the infants from the very early days of birth; the symptoms usually appear with yellow skin and sometimes eyes, jaundice first involves only the face, but it also affects the chest, abdomen, legs, and the soles of the feet and the lower limbs. In fact, jaundice is not a disease but a symptom of excess bilirubin level; jaundice is not painful, but it requires much attention and many considerations, because the rise in bilirubin in the blood creates a toxic condition in the neonatal nervous system and brain damage, and in advanced stage, leads to death; therefore, early treatment is important. Traditional medicine and herbal medicine are usually one of the strategies for treating jaundice. For example, cotoneaster is very useful in treating neonatal jaundice in Iran [37]. Herbal medicine treatments are one of the most frequently used methods in traditional medicine and ethnopharmacology. Previous studies have

shown that cotoneaster can be used in the treatment of neonatal jaundice [38]. The results of the review studies show that in Iran, some plants such as *Cotoneaster discolor* Pojark., *Ziziphus jujuba* Mill., *Hordeum vulgare* L., *Alhagi graecorum* Boiss., *Fumaria parviflora* Lam. and *Cichorium intybus* L. are used to treat jaundice. The results of this study are consistent with the results of our study, and the plants used in that study are, in part, (cotoneaster and *Cichorium intybus* L.), are the same as the anti-jaundice medicinal plants reported in our study [39]. Other studies have shown that medicinal plants such as *Cichorium intybus*, *Salix alba*, *Cotoneaster nummularius* Lindl., *Descurainia Sophia* (L.) Webb ex Prantl, *Malva sylvestris* L., *Berberis integerrima* Bunge, *Rumex acetosella* L., *Phyllanthus emblica* L. and *Alhagi maurorum* Medik. are used for treating neonatal jaundice [40]. Another study shows that in traditional medicine and ethno-pharmacology of Iran, herbs such as *Berberis vulgaris* L., *Artemisia absinthium* L., *Adonis dentate* Delilie, *Cerasus vulgaris* Mill., *Cotoneaster persicus* Pojark., *Cressa cretica* L., *Anagallis arvensis* L., *Ziziphus jujuba* Mill., *Lycium shawii* Roem. & Schult., *Lavandula angustifolia* Mill., *Salix alba* L., *Alhagi persarum* Boiss. & Buhse, *Cynodon dactylon* (L.) Pers., *Cichorium intybus* L., *Linum usitatissimum* L., *Vicia faba* L., *Raphanus niger* Mill. and *Fumaria asepsala* Boiss. have anti-jaundice effects [41]. In Ilam, herb of *Adonis dentate* Delilie. is used in newborns jaundice [42]. In hormones, medicinal plants such as *Anagallis arvensis* L., *Boerhavia diffusa* L., *Centaurium tenuifolium* (M.Martens & Galeotti) B.L.Rob., *Cotoneaster kotschyi* (C.K.Schneid.) G.Klotz, *Desmostachya bipinnata* (L.) Stapf, *Herniaria hirsuta* L. and *Salvia*

Mirzayanii Rech.f. & Esfand. are used in the case of neonatal jaundice [43]. In Behbahan, medicinal plants such as *Adiantum capillus-Veneris* L., *Cynodon dactylon* (L.) Pers. And *Cynodon dactylon* (L.) Pers. To treat neonatal jaundice [44]. The results of a phytochemical study indicate that plant of *Descurainia Sophia* are contains compounds of Beta-bisabidol, Beta-amyrine and cholesterol [45]. The results of a study indicate that plant *Cichorium intybus* L. are contains compounds of cyanidin 3-O-glucoside, delphinidin 3-O-(6'-malonyl) glucoside, and cyanidin 3-O-(6'-malonyl) glucoside [46]. The results of a phytochemical study indicate that plant *Fumaria officinalis* are contains compounds of tetrahydro-coptisine, cryptocavine and aurotensine [47]. The results of a phytochemical study indicate that plant of *Adiantum capillus-veneris* L. are contains compounds of -D-Glucopyranoside , O- -D-glucopyranosyl- (1.fwdarw.3)-β-D-fruc, d-Mannose, 5,7-Dodecadiyn 1,12-diol, 3-Trifluoroacetoxypentadecane, 3-Trifluoroacetoxypentadecane, Pterin-6-carboxylic acid, Imidazole-4-carboxylic acid ,2-fluoro-1-methoxymethyl-,ethyl ester and D-Carvone, Pyrrolizin- 1,7-dione-6-carboxylic acid [48]. The results of a phytochemical study indicate that plant *Rheum ribes* L. is contains compounds palmitic acid, n-eicosane, n-tetracosane , linoleic acid and ethyl linoleate [49]. In the traditional Iran, it is used to strengthen the stomach and digestive system and to reduce the severity of rubella, measles, smallpox and scarlet [50]. Chicory has effects like hepatoprotective, anti-inflammatory and anti-diabetes [51]. Traditional medicine documents indicate that *Fumaria officinalis* L. plant contains proteolytic and anti-jaundice [51]. *Adiantum capillus-veneris* L. has anti-allergic and anti-inflammatory effects [52]. Grapes are used for blood and liver disorders and allergies [53]. Rhubarb is a fat burner used for liver disorders [54].

Many plants have hepatoprotective effects on liver dysfunctions. It is likely that these herbs are anti-yellowing agents that require these effects in pharmacological studies. According to the results of our ethnobotanical study, the plants reported in this study are traditionally used to prevent neonatal jaundice, and it is necessary to prove these effects in clinical and pharmacological studies. If they prove their effect and their non-toxicity, then the

medicinal herbs can be used to treat newborn jaundice.

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Conflict of interest

The authors stated that there was no conflict of interest.

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