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Medicinal Plants for Treatment Kidney Stones, An ethnobotany Study in Shahrekord

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URINARY tract stones are the third leading urinary tract disease. People with kidney stones suffer from severe colic pain, which is not often completely relieved with common analgesic medications and opioid drugs are used to relieve pain. The aim of this ethnobotanical study was to identify medicinal plants used by indigenous people of Shahrekord for kidney stones. The present study was carried out in Shahrekord from 21 April 2017 to 19 February 2018 via face-to-face interview with and the questionnaire including demographic information administered to 29 local traditional therapists for collecting indigenous knowledge of local people about the anti-kidney stone effects of medicinal plants in the region under purpose. The data drawn from the questionnaires were meticulously and appropriately tabulated. Data were finally analyzed by the Excel software. In this study, the frequency use of plants was calculated by the following formula. The results showed that 17 medicinal plants from 11 families are used by the people of Shahrekord to treat kidney stones. The Apiaceae and Asteraceae families were dominant. Most used organs were aerial parts (29%). *Alhagi maurorum* ، *Tribulus terrestris*, *Brassica rapa* subsp. *rapa* had the highest frequency of citation (FC) (79%, 70% and 41%, respectively). The findings suggest that humans traditionally use medicinal plants to prevent or treat kidney stones. Besides, although there is no definite evidence on the effects of some plants on kidney stones, their effects on the kidney stones may be due to their active ingredients.

Keywords: Kidney disease, Pain, Kidney stones, Ethnobotany, Shahrekord, Iran.

Introduction

Urinary tract stones are the third leading urinary tract disease [1]. Epidemiologically, about 5% of women and 12% of men experience kidney stones during their lives [2]. Studies show that about 70-80 of kidney stones are calcium stones, including calcium phosphate and calcium oxalate [3, 4]. Kidney stone is a common clinical disorder and its prevalence is influenced by lifestyle changes, geographical changes, race and ethnicity, and so on [5]. People with kidney stones suffer from severe colic pain, which is not often completely relieved with common analgesic medications and opioid drugs are used to relieve pain [6-8]. In patients with kidney stones, in addition to pain, severe urinary tract obstruction and hydronephrosis, infection and severe bleeding in the urinary tract may also occur [9,10]. Kidney stone open surgery is one of the known methods for the treatment of large kidney stones. Currently, in many patients, treatment has been replaced with less invasive methods and the rate of open surgery has decreased in the world [11]. Studies have shown that the incidence of kidney stones is increasing worldwide [12]. The presence of

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kidney stones can lead to depression and anxiety in the patients and consequently a decrease in their quality of life [13]. Nowadays, because the side effects of chemical drugs have been definitely confirmed, the tendency of the public to use medicinal plants has increased. Kidney stones are a common disease among people that are created due to many causes. The disease can be cured without using chemical methods and by using medicinal plants. Medicinal plants have long been a major source of treatment for diseases [16-20]. They have compounds that have pharmacological effects and are used to prevent, control and cure many diseases [14-20]. Medicinal plants help treat infectious and non-infectious diseases, as well as chronic and acute illnesses through their bioactive and antioxidant substances [6, 17, 20].

Native plants of each region are the treasure and genetic reserves of that region and are especially important due to their favorable properties such as resistance to pests and adaptation to ecological conditions. The aim of this ethnobotanical study was to identify medicinal plants used by indigenous people of Shahrekord for kidney stones.

Methods

Data collection procedure

The present study was carried out in Shahrekord from 21 April 2017 to 19 February 2018 via face-to-face interview with and the questionnaire including demographic information administered to 29 local traditional therapists for collecting indigenous knowledge of local people about the anti-kidney stone effects of medicinal plants in the region under purpose.

The interviewers personally referred to the respondents to elicit and record their beliefs about herbal medicine. Among 29 respondents, 8 were female and 21 male. The education level of the respondents was from diploma to master's degree. The data extracted from the questionnaires were meticulously tabulated and registered. Data analysis was conducted by the Excel software. In this study, the frequency use of plants was calculated by the following formula.

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) × 100

Results

After collecting questionnaires and analyzing the data drawn, 17 plant species were found to be used as anti-kidney stone agents in Shahrekord, including *Tribulus terrestris*, *Alhagi maurorum*, *Adianthum capillus-veneris* L, *Echinophora platyloba* DC., *Kelussia odoratissima* Mozaff, *Brassica rapa* subsp. Rapa, *Zea mays*, *Trachyspermum ammi*, *Camellia sinensis*, *Utrica dioica* L., *Centaurea cyanus*, *Tripleurospermum parviflorum* L., *Achillea millefolium*, *Tanacetum polycephalum* (L.) Schultz-Bip, *Foeniculum vulgare*, *Nigella sativa* and *Thymus vulgaris*. Additional information in this regard is shown in

TABLE 1. Ethnobotanical data on medicinal plants with anti-kidney stone properties in Shahrekord.

Scientific name	Herbal family	Local name	Frequency of use	Organs used	Remedies
Tribulus terrestris L.	Zygophyllaceae	Kharkhasak	70%	Aerial organs	kidney stone
Alhagi maurorum auct. non Medik.	Fabaceae	Kharshotor	79%	Aerial organs	kidney stone
Adianthum capillus-veneris L.	Polypodiaceae	paresiavashan	6%	Aerial organs	kidney stone
Echinophora platyloba DC.	Apiaceae	Khosharizeh	13%	Aerial organs	kidney stone
Kelussia odoratissima Mozaff	Apiaceae	Karafs kouhi	3%	Stem, leaf	kidney stone
Brassica rapa subsp. rapa	Brassicaceae	Shalgham	41%	Plant tuber	kidney stone
Zea mays L.	Poaceae	Zorat	13%	Hebal forelock	kidney stone
*Trachyspermum ammi (*L.) Sprague	Apiaceae	Zenian	3%	Leaf, flower	kidney stone
Camellia sinensis (L.) *Kuntze*	Theaceae	Chaye sabz	2%	Leaf	kidney stone
Utrica dioica L.	Utricaceae	Gazaneh	3%	Aerial organs	kidney stone
Centaurea cyanus L.	Asteraceae	Gole gandom	3%	Stem, leaf, flower	kidney stone
Tripleurospermum parviflorum L.	Asteraceae	Babouneh kazeb	13%	Flower	kidney stone
Achillea millefolium L.	Asteraceae	Boumadaran	3%	Aerial organs	kidney stone
Tanacetum polycephalum (L.) Schultz-Bip.	Asteraceae	Mokhalaseh	3%	Aerial organs	kidney stone
Foeniculum vulgare Mill.	Apiaceae	Razianeh	6%	Sed	kidney stone
Nigella sativa L.	Ranunculaceae	Siahdaneh	3%	Leaf, seed	kidney stone
Thymus vulgaris L.	Lamiaceae	Avishan	3%	Leaf, flowering flower, flower	kidney stone

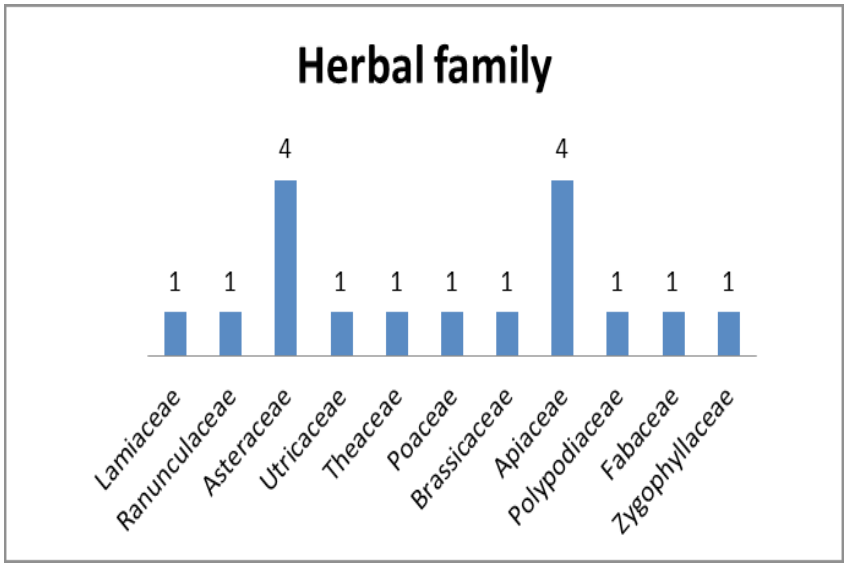

Fig. 1. Distribution of the families of medicinal plants with anti-kidney stone properties in Shahrekord.

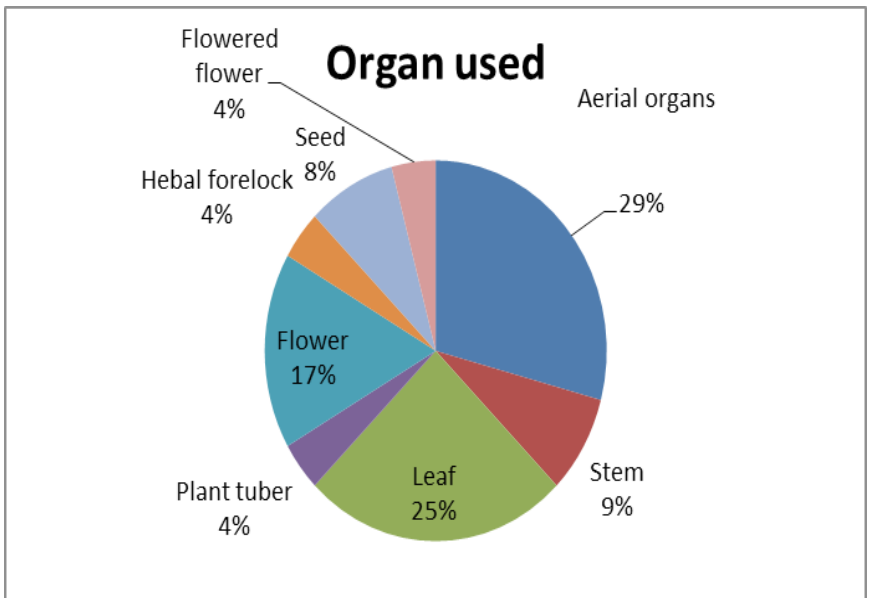

Fig.2. Percentage of use of organs of medicinal plants with anti-kidney stone properties in Shahrekord.

Table 1.

Discussion

Kidney stones in different types are hard sediments within the kidneys that are composed of acid salts and cause pain in the back and shoulders, with different treatments for them depending on the type of stone. Kidney stones are created due to different causes such as family history and inappropriate nutrition, and the treatment depends on the type of stone and conditions of the patient. Kidney stones are hard sediments within the kidneys that are composed of acid salts and salts. Medicinal plants are one of the oldest treatments for kidney stones.

The results of ethnobotanical studies in Lorestan province, Iran showed that medicinal plants such as *Alhagi persarum*, *Berberis integrima*, *Capsella bursa*, *Dracocephalum imberbe*, *Glycyrrhiza glabra*, *Heracleum persicum*, *Matricaria aurea*, *Satureja macrosiphone*, *Tragapogon caricifolius*, *Ulmus minor*, *Zea mays* L. are used to treat kidney stones [21].

The results of one study in Shiraz (Iran) showed the medicinal plants *Alhagi maurorum*,

Tribulus terrestris, *Nigella Sativa*, *Althea aucheri* Boiss., *Lactuca sativa* L, *Prunus cerasus*, *Alhagi camelorum*, *Mangifera indica*, *Prangos acaulis* (DC.) Bornm, *Urtica dioica* L, *Fumaria officinalis*, *Plantago psyllium*, *Medicago sativa*, *Apium graveolens*, *Rheum ribes*, *Arctium lappa*, *Pimpinella anisum*, and *Gundelia tournefortii* are used for kidney stones [22]. Some of the plants reported in studies of Lorestan and Shiraz are the same as those reported in our study (Shahrekord). Medicinal plants have a therapeutic effect on diseases [16-20]. Medicinal plants due to their active substances have therapeutic effect.

Comparing our study with other studies suggests that the *Alhagi maurorum* is a common medicinal plant for kidney stones. Currently in Iran, a herbal drug called Sancol® is produced that contains *Alhagi maurorum* extract. Native medicinal plants to ShahreKord have not yet been studied in clinical and scientific studies with animal models and human subjects. Therefore, medicinal plants with anti-kidney stone effect in Shahrekord can provide new and scientific ideas for future research. Researchers need to investigate the clinical efficacy of the medicinal plants reported in the current study and their active ingredients. When the positive effects of these medicinal plants are proven, drugs that can be beneficial for the treatment and management of kidney stones can be produced.

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Conflict of interest

The authors stated that there was no conflict of interest.

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