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An ethnobotanical study of medicinal plants used in treatment of kidney stones and kidney pain in Lorestan province, Iran

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ABSTRACT

Kidney stones are the third most frequent disorder of the urinary tract, after infections and pathological disorders of the prostate. Most affected patients suffer from severe colicky pain. The use of herbs for treating diseases has been a common method since ancient times. This study aimed to identify and report the most important and effective herbs for treating kidney stones and kidney pain in Lorestan province (west of Iran). We accomplished our goal by gathering and integrating indigenous data from local inhabitants of Lorestan. Data were gathered with cooperation of the agents of public health service network all over the towns of Dorud, Boroujerd, Khorramabad, Aleshtar, Poledokhtar, Aligoodarz, Nurabad and Kouhdasht. Prepared questionnaires were distributed to the health system trained volunteers. These trained inquirers attended in villages and recorded the local herbal therapy methods and information. Finally, 17 plants from 12 families were identified. Besides predicating the traditionally believed effects of these herbs, it is essential for researchers to find out the actuality of their clinical effectiveness and active substances. Once the positive effects of these herbs were proved to be true, it is possible to produce drugs which are useful in treatment and controlling kidney stones and pain.

KEY WORDS: Lorestan province, Herbs, Traditional medicine, Kidney stones, Kidney pain, Iran.

1. INTRODUCTION

Kidney stones are the third most frequent disorder of the urinary tract, after infections and pathological disorders of the prostate. Since most affected patients suffer from severe colicky pain which can not be eliminated by conventional analgesics, opioid drugs are used to relieve pain (Tanagho, 1980). Iran is one of the countries which are located on the "kidney stone belt". Kidney stone prevalence in this region is reported to be 2-3 percent (Erbagci, 2003; Pearle, 2007). Kidney stone is a common clinical disorder and its prevalence is influenced by lifestyle changes, geographical changes, race, ethnicity and other factors (Leonardo and Reyes Rabanal; Stamatelou, 2003).

Kidney stones cause severe pain. Pain can also be due to renal infection (pyelonephritis). Moving stones are the main cause of pain specially when they move from the kidneys to the ureter and pass into the bladder. This leads to frequent severe pain. Pain is an unpleasant sensory and emotional experience associated with actual tissue damage or harm to another type of tissue. Pain is the most common reason for medical advice in the United States (International Association for the Study of Pain, 2010; Turk & Dworkin, 2004).

In addition to pain, patients affected with kidney stone may develop severe urinary tract obstruction and hydronephrosis, infection and bleeding, thus in some cases breaking the stone or surgery is needed for removing it. In addition to the high cost of surgery and breaking up the stones, various side effects such as urinary tract infections are expected urinary surgical intervention. Hence, special attention is paid to the use of herbal preparations.

In many countries and cultures, a variety of medicinal plants are used for treating diseases and there is an extreme belief in their effectiveness (Ghasemi Pirbalouti, 2013; Bahmani, 2012; Bahmani, 2014). A collective effort is needed to predicate the herbal therapeutic knowledge of Lorestan province. In this study we tried to provide a list of indigenous medicinal plants which are used to treat kidney stons and pain traditionally.

2. MATERIALS AND METHODS

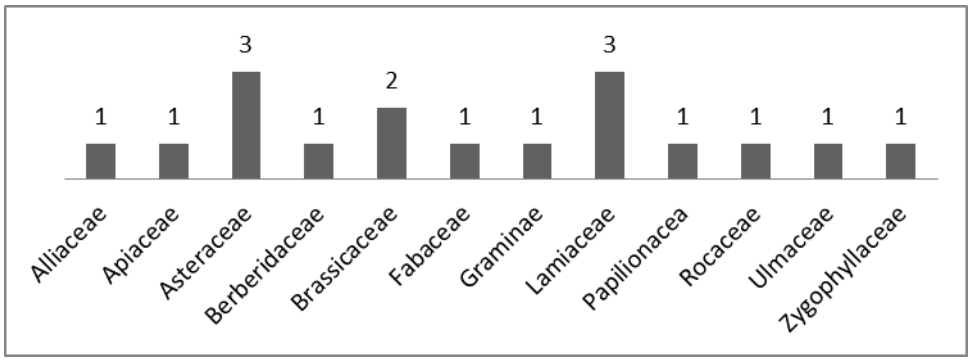
2.1. The study area: Lorestan Province is a province of western Iran, located latitude and longitude of 33.4871° N, 48.3538°. Lorestan has four different climates (semi-dry, semi- moist temperate , semi- moist cold, altitude climate). Its area is approximately 28,300 square acres of land. Minimum height above sea level is 330 m in Pole-Zal and maximum height above sea level is 4050 m in Oshtoran-kooh. The province has a varied climate

and this variability is quite evident from the northeast to the southwest. Lorestan is neighbored with Hamedan and Markazi provinces in north, Isfahan in east, Khuzestan in south and Ilam and Kermanshah in west.

2.2. Method of identifying and collecting plants: Information of traditional herbs were provided through interviews and questionnaires, with assistance of Management and Planning Organization of Lorestan province and Lorestan University of Medical Sciences. Local inhabitants data were also considered through cooperation with Health Networks of Dorud, Burujird, Khorramabad, Aleshtar Poldokhtar, Aligoodarz, Nurabad and Kouhdasht. Prepared questionnaires were distributed to the health system trained volunteers. The questionnaire included inquiries about the location, characteristics of the interviewee, local name of the plant, usable pars, preparation method, growing seasons and species which can be kept at home. Trained inquirers attended in villages and recorded the local herbal therapy methods and traditions. Interviewees were among the seniors of the village known to be aware of herbal effects. Gathered information and results were put in prepared tables.

3. RESULTS

After totalizing and classifying the collected data, a total number of 17 medicinal plants from 12 families were identified to be effective on control and treatment of kidney stone and pain which are marked in table 1 in addition with other useful details.



Graph 1. Frequency of plant families

Discussion: Kidney stone is the third most frequent disorder of the urinary tract. Renal colic is the sudden onset of an acute severe pain which starts from the flank and spreads to the groin. The pain is recurring intermittently with an increasing severity (Kasper, 2005). In this study, we have compared the therapeutic effects of these reported plants with those of the published literature.

Alhagi (or camel thorn) distillate which has cold nature and different characteristics from its raw form or tisane form in terms of traditional medicine, is used for expulsion of bile and kidney and bladder stones, as well as anti-whooping cough, fever and chills. It also has diuretic effect and no specific side effect is reported till now (Zargari, 1995; Dehkordi, 2002). In a remarkable study Cyrus et al showed the significant effect of camel thorn on the expulsion rate of kidney stones and concluded that it may also speed up the expulsion process (Cyrus, 2010). Traditional sources and clinical studies suggest that camel thorn plant has stone-expulsive effect. Barberry is known to have polyphenolic compounds, pectin, gum, vitamin C and malic acid. Most therapeutic and pharmacological effects of barberry is attributed to the most important alkaloid found in its root and stem bark, berberine (Kazemi, 2008; Imanshahidi, 2008). Barberry has also been reported to have anti-inflammatory effects (Shamsa, 1994).

Watermelon has ingredients such as colocynthis, colocynthetin, plant phytosterols, gum, pectin, albuminoids, etc. (Wasfi, 1994; Afifia, 1973; Darwish, 1974). Studies show that water boiled branches of lemon balm has analgesic and anxiolytic effects of (Miladi-Gorji, 2005; Miladi-Gorji, 2005). Previous studies confirm reported effect is in our study. Licorice has a curative effect on rheumatism and arthritis (Akhondzadeh, 1979; Dijsselbloem, 2004). Chamomile has sedative and anti-agitation effect (Barene, 2003). Fountain grass is used as blood purifier in traditional medicine and has been reported to increases blood antioxidant levels. Fountain grass is diuretic and tranquilizes neuralgia (Samsam-Shariaat, 1995; Gill, 2007; Sefidkon, 2013). Roses are used as sedatives, anti depressants, and believed to eliminate insomnia (Lawless, 1995; Tisserand and Balacs, 1995). All aforesaid effects of licorice, chamomile, fountain grass and roses in literature, confirm effects which were known traditionally in Lorestan province. Marian thistle has various pharmacological effects including antioxidant and anti-cancer effects and protects hepatocytes. These effects are attributed to the different kinds of flavonolignans which are found in silymarin. Silymarins are mixed compounds of isosilybins (A and B), silybins A, silybins B, silydianin, taxifolin and silychristin (Osuchowski, 2004; Der Marderosian, 2001; Gazak, 2007; Gebhardt, 2002; Kummer, 2001). Analgesic effects of Marian thistle seem to be related to the flavonolignans of silymarin. Salsify is used in traditional stone expulsion therapy (Shafizadeh, 2002). It has the same usage in Lorestan province.

By comparing the therapeutic effects reported in our study with previously published literature, we concluded that some of the reported effects in our study are totally new and some others have close similarities with other studies, thus the validity of this study appears to be high.

It is necessary for researchers to find out the actuality of clinical effectiveness of the reported herbs and their active substances (Bahmani, 2014; Delfan, 2014; Asadi-Samani, 2014; Saki, 2014; Asadbeygi, 2014; Karamati, 2014; Bahmani, 2015; Gholami-Ahangaran, 2012; Amirmohammadi, 2014; Eftekhari, 2012; Bahmani, 2012; Bahmani, 2013; Delfan, 2015). Once the positive effects of these herbs proved, it is possible to produce drugs which are useful in treatment and management of kidney stones and its related pain.

Table 1. Complete information of ethnobotany, preparation method and therapeutic effects of herbs effective in kidney stone and pain relief in Lorestan province.

Scientific name	Family	Local name	Persian name	Usable part	Preparation method	Gathering season	Traditional/ Therapeutic effect
Alhagi persarum	Fabaceae	Hushtar-khar	Khar-e-shotor	root	tisane	spring	Kidney pain
Berberis integrima	Berberidaceae	Zereshk	zereshk	fruit	tisane	spring	Stone expulsion
Capsella bursa	Brassicaceae	Shomi	hendevane	Fruit and leaf	Raw or leaf tisane	Spring, summer	Kidney stone management
Dracocephalum imberbe	Lamiaceae	zaravi	Badranj booyeh	Stem and leaf	Leaf tisane	spring	Kidney pain
Glycyrrhiza glabra	papilionacea	melim	Shirin bayan	Wholeparts arts specially roots	Root is chewn	Spring, autumn	Kidney pain
Heracleum persicum	Apiaceae	golpar	golpar	Flower and leaf	tisane	spring	Kidney pain
Matricaria aurea	Asteraceae	Gole bayene	babooneh	petals	tisane	spring	Kidney pain
Nasturtium officinale	brassicaceae	balmak	Alaf-e-cheshme	leaf	tisane	Four seasons	Kidney stone management
Nectaro scordeum	Alliaceae	aneshk	Piaz tabestani	twigg	Raw or inside sauce or beverages like	spring	Stone expulsion
Rosa damascena	Rocaceae	Lili-sorkhe	rose	fruit	tisane	summer	Kidney pain
Satureja macrosiphone	Lamiaceae	marze	marze	Leaf and stem	Raw with food	spring	Stone expulsion
Silybum marianum	Asteraceae	Khar-gandomdone	Khar-e-maryam	flower	tisane	Spring and mid summer	Kidney pain
Stachys lavandulifolia	Lamiaceae	pashmine	Chay koohi	flower	tisane	spring	Kidney pain
Tragapogon caricifolius	Asteraceae	sheng	shang	Whole parts specially leaves	Raw or tisane	spring	Stone expulsion
Tribulus terrestris	Zygophyll aceae	Pee-kola	Khar khasak	seeds	tisane	Spring, summer, autumn	Kidney pain
Ulmus minor	Ulmaceae	Vezm	ooja	Extract, stem, roots	Boiled infusion is drunk in the morning	Four seasons	Stone expulsion
Zea mays L.	Graminae	Khayate-zorat	Kokol zorrat	Corn silk	tisane	summer	Stone expulsion

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