ISSN 0975 -8542

Journal of Global Pharma Technology

Available Online at www.jgpt.co.in

REVIEW PAPER

A Review on the Most Important Medicinal Herbs Native to Iran with Anti-Acetaminophen Toxicity

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Abstract: Acetaminophen is an analgesic and anti- fever drug, which can be toxic in high doses and leads to hepatic and renal injury. Acetaminophen poisoning can cause many complications and injuries in the body including vomiting, diarrhea, malaise, shock, jaundice, and liver failure and in some cases will lead to myocardial and kidney damage. Against all toxic and destructive effects of drugs like acetaminophen, some compounds are found that can partially restrain poisoning of abuse such compounds. In this review article, medicinal plants native to Iran have been reported, which are used to protect acetaminophen toxicity. In this review study, searching the articles with key words such as acetaminophen, hepatotoxicity, herbs, extracts, and essential oils were used. Searching the articles was conducted through databases of income in Iran like Google Scholar, ISI January, MegaIran, and a number of other databases. Medicinal plants including green tea, turmeric, cress, dandelion, and capers are the most important medicinal plants against the toxicity of acetaminophen. It seems that pharmacological bioactive and antioxidants substances obtaining from plant and biological materials are anti- acetaminophen poisoning.

Keywords: *liver, Toxicity, Acetaminophen, Herbs, Iran.*

Introduction

Acetaminophen is the drug from analgesics category and derivatives of Para amino phenol which is an appropriate substitute for aspirin in the treatment of mild to moderate muscle aches, joint pain, headache, fever, post-operative pain, pain after childbirth, etc. [1].

Acetaminophen is an analgesic and antipyretic drug which is toxic in high levels and causes hepatic and renal damages [2]. Physicians haven't enough information about complications of this drug and its treatment details, its preparation and its metabolism is easy without a prescription; therefore, prescribing and consumption is high [3,4]. Poisoning with Acetaminophen can cause side effects to the body, especially the liver damage and also die. Acetaminophen poisoning is usually associated with vomiting, diarrhea, malaise, shock, jaundice, liver failure, and in some cases will lead to myocardial and kidney damage [5]. Against all toxic and destructive effects of drugs like acetaminophen, that can partially prevent poisoning, there are some antidotes. Among these compounds, the active ingredients of plant extracts are promising [6-8]. Using herbs to treat diseases has long been common in human societies and were considered up to about half a century ago as one of the most important suppliers of drugs for the treatment of diseases [9-12]. Studies have shown that medicinal plants with flavonoids and phenolic compounds have

many biological effects including antioxidant properties [13-27]. In this review article, medicinal plants native to Iran has been reported, which are used to protect acetaminophen toxicity.

Methods

In this review article of literature searches were conducted using key words such as acetaminophen, hepatotoxicity, herbs, extracts, and essential oils. Searching the articles was implemented from databases inside and outside of Iran like Google Scholar databases, ISI January, Mega Iran, and a number of other sites.

Results and Discussion

In Iran, five plants are used as liver protective against acetaminophen. Medicinal herbs including green tea, turmeric, cress, dandelion, and capers are the most important medicinal plants against acetaminophen toxicity. The mentioned medicinal herbs with additional information have been presented in Table 1.

Table1: Iranian native medicinal plants with liver protective against the acetaminophen with Persian name, scientific name, family name.

S.No	Scientific Name	Family Name	Persian name	Description
1	Camellia sinensis L.	Green tea		Administration of 7 mg green tea extract in mice for 30 days resulted in a significant reduction in ALT and AST levels in the experimental group than the acetaminophen group. Histopathological examinations also revealed reduction of hepatic necrosis, congestion and the accumulation of inflammatory cells and red blood cells [28].
2	Curcuma longa	Turmeric	Turmeric	Dose of 1000 mg kg of turmeric extract reduces the scope of liver necrosis, inflammation and reduces also congestion in the liver cells [29].
3	Lepidiumsativum cruciferua L.	Shahi	Shahi	Shahi extract at a dose of 1000 mg kg in mice showed that ALP, GPT, GOT and MDA were significantly lower in rats [30].
4	Taraxacum syriacum	dandelion	dandelion	Dandelion extract at a dose of 200 mg of acetaminophen poisoning causes reduced toxic doses (700 mg kg ip) [31].
5	Capparis spinosa	Capparidaceae	Capers	capers aqueous extract at a dose of 200 milligrams per kilogram of feed, reduces enzymes including ALT, AST, ALP and total bilirubin increasesby toxic dose of acetaminophen [32].

Herbal medicines are the most important part of traditional medicine that have a long history in human life [27]. Based on the obtained results, herbs, green tea, turmeric, cress, dandelion, capers, green tea are the most important herbals against Acetaminophen. Among the properties of green tea, the anti-inflammatory, anti-bacterial, anti-viral effects can be mentioned while this plant has the function of wound healing [33,34].

The main active ingredient of turmeric herb is curcumin which is effective in various diseases [35,36]. Green tea contains flavenoles, aglycones, theanine, and aromatic compounds [37]. Dandelion has been used fortreatinf gastrointestinal disorders such as anorexia, indigestion and insomnia, eye problems, treatment of rheumatism and skin diseases. It is also used as diuretic, laxative, treatment of anemia, inflammation, jaundice treatment, detoxifies, blood purifier, and fever such as eczema [38-40]. It seems that bioactive substances with natural antioxidant and pharmacological activities are effective anti-poisoning agents which can be used against diseases or toxic effects of agents such as acetaminophen [41,42].

The exact mechanisms of these plants are not clear. It is clear that acetaminophen causes oxidative stress, increases hepatocytes and decreases the level of glutathione (GSH), as well as the total antioxidant capacity. Antioxidants have been shown to combat oxidative stress and increase the body antioxidant capacity [43-50].

These plants with their antioxidant activity can help treating or preventing other diseases, too.

Conclusion

The plants presented in table 1 have all antioxidant activities. Hence, they may induce, at least in part, their effects by their antioxidant properties.

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