Journal of Herbal Medicine 7 (2017) 11–17

Contents lists available at ScienceDirect

Journal of Herbal Medicine

journal homepage: www.elsevier.com/locate/hermed

Research paper

Clinical investigations on gastroprotective effects of ethanolic extract of *Phyllanthus emblica* Linn fruits

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ARTICLE INFO

Article history:
Received 29 October 2015
Received in revised form 1 June 2016
Accepted 13 September 2016
Available online 14 September 2016

Keywords:
Phyllanthus emblica
Euphorbiaceae
Gastroprotective
Gastrointestinal disorders

ABSTRACT

The ethanolic extract of dried fruits of *Phyllanthus emblica* Linn. (Euphorbiaceae) was tested for its gastroprotective effects in patients with gastrointestinal disorders. Thirty patients were selected for the study and divided into three groups consisting of ten subjects each. Patients were given the ethanolic extract of *P. emblica* (Pe.Et), lactose (placebo) and omeprazole for 14 days respectively.The test group received a Pe.Et dose of 500 mg/day in three divided doses, i.e., each capsule contained 166.6 mg PeEt with lactose added making 500 mg per capsule. The dose of ethanolic extract of *P. emblica* was calculated on the basis of the crude powder of *P. emblica* used by traditional healers. Capsules of the same colour but filled with 500 mg lactose were given thrice a day to the patients of the negative (placebo) control group. Omeprazole at the recommended dose of (40 mg/day) was given to the patients of the positive control group. A questionnaire and endoscopic based procedures were adopted for investigation. The gastroprotective effects of *P. emblica* were compared with both the placebo and the omeprazole-treated group.The results of the study showed that Pe.Et alleviated pain, vomiting, sleep disturbances and other associated problems. Gastroscopic evaluations also showed the healing of damaged mucosa. Taken together these findings indicate that the ethanolic extract of *P. emblica* fruits has gastroprotective effects in humans and justifies its traditional use.

1. Introduction

P. emblica is commonly known as *Emblica myroblan* in English and as Amla in Urdu (Khan, 2009). The plant is distributed throughout the tropical and subtropical regions of Pakistan and India. It has been cultivated in Ceylon, China and Malaysia (Kirtikar and Basu, 1987; Chopra et al., 1985).

Fruit of *P. emblica* is traditionally used for the treatment of anaemia, diabetes, ulcers, and various other diseases. The pulp of the fresh fruit has been reported to contain 81% water, 0.5% protein, 0.1% fat, 0.7% mineral matter, 3.4% fibres, 14% carbohydrates, 0.05% calcium, 0.02% phosphorous, 1–2 mg/100 g iron, 0.2 mg/100 g nicotinic acid and 600 mg/100 g vitamin C (Khan, 2009). Fresh *P. emblica* is reported to contain about 20 times more vitamin C than orange juice. Dried fruits are reported to contain tannins. Other components include phyllembic acid, lipids, gallic acid, emblicol, mucic acid, ellagic acid, and glucose. Seeds are reported to contain phosphatides, some essential oil with linolenic, linoleic, oleic, stearic, palmitic, myristic acids, and proteolytic and lipolytic enzymes (Ram and Rao, 1978; Zhang et al., 2000).

Scientific studies have shown that *P. emblica* extracts have hypoglycaemic, antidiabetic, antihypercholestrolaemic (Kim et al., 2005; Anila and Vijayalakshmi, 2000), cardioprotective (Rajak et al., 2004), hepatoprotective (Pramyothin et al., 2006), immunomodulatory (Srikumar et al., 2005), antipyretic, analgesic (Perianayagam et al., 2004), antitussive (Nosál'ová et al., 2003) and snake venom-neutralising activities (Alam and Gomes, 2003). Moreover, it has been shown to have antioxidant activities in a number of *in vitro* and *in vivo* models. Among various antioxidant compounds identified, Vitamin C has been shown to contribute approximately 45–70% of the total antioxidant activity of the *P. emblica* fruit (Alam and Gomes, 2003; Scartezzini and Speroni, 2002). *P. emblica* has been reported to have antimicrobial activity

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http://dx.doi.org/10.1016/j.hermed.2016.09.002
2210-8033/

against *Escherichia coli, Klebsiella ozaenae, Klebsiella pneumoniae, Proteus mirabilis, Pseudomonas aeruginosa, Salmonella paratyphi A, Salmonella paratyphi B* and *Serratia marcescens* (Saeed and Tariq, 2007).

Gastroprotective properties of *P. emblica* have scientifically been shown in a number of animal models. A herbomineral formulation named "Pepticare", which is composed of *Phyllanthus emblica, Glycyrrhiza glabra* and *Tinospora cordifolia* was found to have antiulcer and antioxidant activity in rats (Bafna and Balaraman, 2005). An ethanolic extract of *P. emblica* was investigated for its antisecretory and antiulcer activities in various experimental models in rats, including pylorus ligation shay rats, indomethacin, hypothermic restraint stress and necrotizing agents induced peptic ulcers (Al-Rehaily et al., 2002; Sairam et al., 2002). Here we report the beneficial effects of the ethanolic extract of dried fruits of *P. emblica* in patients suffering from gastrointestinal disorders.

2. Materials and methods

2.1. Collection of plant material

Dried fruits of *P. emblica* were purchased from the local herbal market in Bahawalpur. Plant material was authenticated by an expert botanist, and a sample was preserved in the herbarium of the Pharmacology Section, Faculty of Pharmacy and Alternative Medicine, the Islamia University of Bahawalpur, Pakistan, for

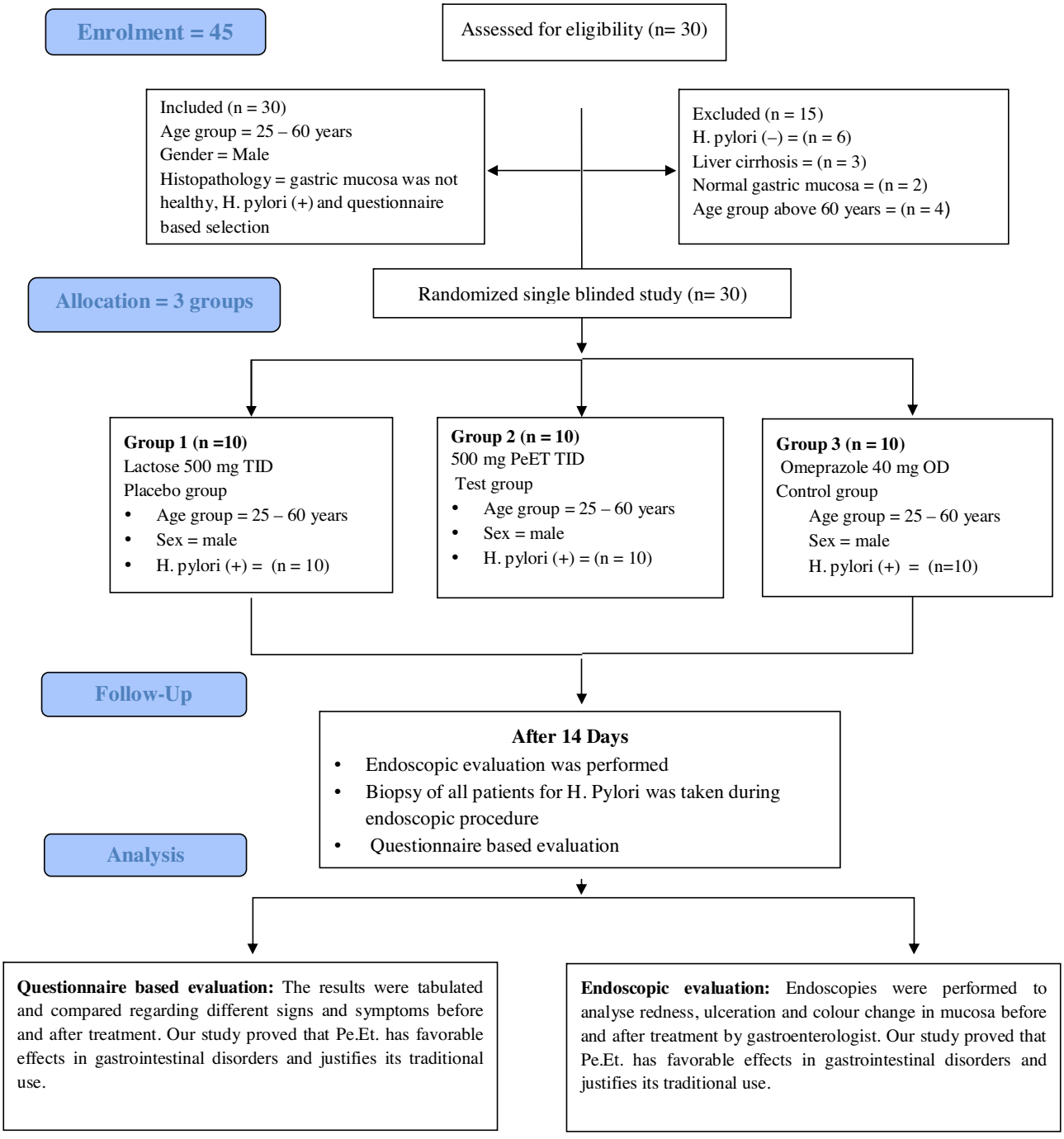

Fig. 1. Flow diagram of participants through each stage of the study.