Artemisia Annua

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Introduction

Artemisia annua is a plant that belongs to the family of Asteraceae and contains Artemisinin, a molecule known for its anti-parasitic properties [1]. Artemisinin is a sesquiterpene lactone with a 1,2,4-tioxane ring system, used for treating fevers for over two millennia [1]. More recently Artemisia has come to the fore for its antineoplastic potential [2]. Its specific anti-cancer effects have been demonstrated in some research studies and Artemisia's cytotoxic action on different cell lines is described in several scientific works [2,4]. Artemisia's major antineoplastic action appears to be due to the 2EF1 tyrosine kinase enzyme cascade leading to cell death. These studies have raised diffuse interest due to potential clinical applications.

The natural compound extracted from Artemisia annua is metabolized in a very short period of time: after an average of 2 hours (between 1½ and 4 hours artemisinin molecules lose their efficacy [4-11]. In the light of these results, more trials have been conducted to obtain an active extract with a longer half-life and some semi-synthetic molecules have been developed having similar mechanisms of action and longer stability [5,6]. The significant antitumoral activity of artemisinin and licensed semisynthetic its derivatives has been documented in vivo. One study that tested 55 cell lines from Developmental Therapeutics program of the national Cancer Institute (NCI) showed inhibitory activity against many cancer cells [3]. The Artemisinin and semisynthetic derivatives have much anticancer action: induce cell growth arrest in all cell cycle phase (-7-3); proapoptotic effect by Bax/Bcl-2 gene interaction [7-10]; inhibition metastasis/invasion by MMP gene family and E cadherin activity [11]; angiogenesis inhibition by modulating VEGF, FGF receptors [12-14], also its activity in resistant cancer cells [3-15]. The first in-vivo data about the use of artemisinin in animal models were presented in 2007, but the results previously obtained in vitro could not be confirmed. This study demonstrates the dose-depending toxicity of plant [16-17]. Some clinical applications were then tested on human patients treated with hydro-alcoholic extracts in liquid solution, or capsules containing dried extracts at fixed titrations which all showed a weak action, especially with artemisinin derivatives, where reported also the side effects of its use [18]. Some anecdotal reports about cases of "miracle healing" have aroused in Italy a growing interest in the do-it-yourself treatment. Current Drug Therapy 2: 210.223.

Keywords: Asteraceae; Anti-parasitic; Anti-cancer; Tyrosine kinase enzyme

References