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Natural Remedies – A cure for arthritis?

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ABSTRACT:

Aim: Traditional medicinal plants were used for the treatment of various diseases from many centuries where gained their importance in traditional knowledge periodically. The phytoconstituents from plant origin are potential against arthritis. This review presents about the plant profile regarding their anti-arthritic activity.

Methods: Bibliographic investigations were made in order to analyze about natural remedies for the treatment of arthritic activity. The plant profiles including common name, scientific name, bioactive compound along with their mechanism of action has been discussed. The discussion includes the assessment of parameters which plays an utmost importance to identify the arthritis.

Results: It was observed that only few plants were reported regarding the characterization of extract at the level of bioactive compounds.

Conclusions: Replacing the conventional treatments by natural remedies of plant origin ensure safety, effective and devoid of side effects. It is also very much needed to characterize the extract at the level of bioactive compounds where those observations are valid and reproducible.

Keywords: Arthritis, Plants, traditional uses, bioactive compounds.

INTRODUCTION

Musculoskeletal diseases such as arthritis, gout, osteomalacia, osteoporosis etc., cause severe long term joint pain, swelling and limitation of the movement. These diseases affect a significant population of the society and often lead to major personal, family and financial consequences as well as increased mortality [1].

Arthritis is a disease as old as mankind and is globally the most common musculoskeletal disorder. The word arthritis is derived from Greek word *arthron* meaning 'joint' and the Latin word *itis* means 'inflammation'. There are more than 100 forms of arthritis. Some of them are osteoarthritis, rheumatoid arthritis, psoriatic arthritis and other related autoimmune diseases.

In the year of 2007, arthritis foundation has estimated that two-third of the population was suffering from arthritis and census reports that by 2030 it increases beyond to 40% [2]. It also have been reported that women were affected more comparatively with men.

Numerous treatments are available for various arthritis but they have their own drawbacks. The regular usage of conventional medicines such as NSAIDS like Ibuprofen, Aceclofenac etc are limited to minimize the degree of pain and steroids such as cortisone and hydrocortisone remains unsatisfactory for prolonged treatment. The prolonged usage of steroids results in deleterious effects like GI disturbances and renal morbidity.

Table No. 1: List of Natural Remedies potential against arthritis

S.No.	Botanical Name of plant and family	Common name	Bioactive compounds	Mechanism of Action	Animal model	activity	References
1	<i>Curcuma longa</i> (Zingiberaceae)	Turmeric	Curcumin, Demethoxycurcumin, Bisdesmethoxycurcumin,	Inhibits NF- κ B, COX-2, and MMP-9	Streptococcal cell wall-induced arthritis	Antiarthritic and anti-inflammatory	[3]
2	<i>Zingiber officinalis</i> (Zingiberaceae)	Ginger	Sesquiterpenes, camphene, β -phellandrene, curcumene, cineole, geranyl acetate, terphineol, terpenes, borneol, geraniol, limonene, β -elemene, 6-Shogaol	Inhibits NF- κ B, COX-2, PGE2	Freund's Adjuvant-induced arthritis	Antiarthritic and anti-inflammatory	[1,2]
3	<i>Boswellia serrata</i> (Burseraceae)	Indian Frankincense	Boswellic acid and its derivatives	Inhibits IL-1, IL-6, TNF- α , PGs, Nitric oxide (NO), NF- κ B, COX-2 and 5- LOX	Bovine serum albumin-induced arthritis	Antiarthritic and anti-inflammatory	[2,4]
4	<i>Carica papaya</i> (Cruciferae)	Papaya		Inhibits prostaglandin-mediated inflammation	Formaldehyde-induced arthritis	Antiarthritic and anti-inflammatory	[2]
5	<i>Camellia sinensis</i> (Theaceae)	Green Tea	Epigallocatechin-3-gallate	Inhibits COX-2, interferon- γ , TNF- α , NF- κ B, iNOS, PGE2 phosphorylation of c-Jun-N-terminal kinase (JNK) p46 and decreases phosphor-c-Jun and DNA-binding activity of AP-1	Collagen-Induced Arthritis	Antiarthritic	[2,3]
6	<i>Cynodon dactylon</i> (Graminae)	Durva Grass		Decreases myeloperoxidase, nitrite, C-reactive protein, ceruloplasmin and thiobarbituric acid reactive substances and increases antioxidants	Adjuvant-Induced arthritis	Antiarthritic	[2]
7	<i>Semecarpus anacardium</i> (Anacardiaceae)			Inhibits production of IL-1 β and IL-12p40. Suppresses LPS-induced nuclear translocation of NF- κ B, inhibits I κ Ba phosphorylation and nuclear translocation of AP-1 and increases	Adjuvant-Induced arthritis	Antiarthritic	[5]

antioxidant status							
8	<i>Vitis vinifera</i> (Vitaceae)	Grape vine	Resveratrol	Inhibits NF- κ B, COX-2, PGE2, IL-1 β and IL-6		Antiarthritic	[2]
9	<i>Commiphora mukul</i> (Burseraceae)	Guggul	Guggulsterone	Inhibits NF- κ B, COX-2 and MMP-9	Adjuvant-Induced arthritis	Antiarthritic	[2,3]
10	<i>Withania somnifera</i> (Solanaceae)	Withania	Withanolide	Inhibits NF- κ B	Adjuvant-Induced arthritis	Antiarthritic	[2,3]
11	<i>Costus speciosus</i> (Zingiberaceae)	Crepe Ginger	Alkaloids and flavonoids	Inhibits COX-2 pathway	Freund's Adjuvant-induced arthritis	Antiarthritic and anti-inflammatory	[6]
12	<i>Ficus lacor</i> (Moraceae)	Fig	Alkaloids, glycosides and flavonoids		Adjuvant-Induced arthritis	Antiarthritic	[7]
13	<i>Strychnos potatorum</i> (Loganiaceae)	Clearing-nut		Inhibits TNF- α and ILs	Freund's Adjuvant-induced arthritis	Antiarthritic and anti-inflammatory	[8]
14	<i>Nigella sativa</i> (Ranunculaceae)	Nigella	Thymoquinone	Inhibits increase of Lipid peroxidation, Nitric oxide	Collagen-Induced Arthritis	Antiarthritic and anti-inflammatory	[9]
15	<i>Plumeria alba</i> (Apocynaceae)	Frangipani		Maybe inhibition of PGs	Formaldehyde induced arthritis	Antiarthritic	[10]
16	<i>Ajuga bracteosa</i> (Labiatae)	Bugle weed	Ajugarin, lupulin A, Withaferin A, reptoside and 6-deoxyharpagide	Inhibits COX-1 and COX-2	Formaldehyde induced arthritis	Antiarthritic	[11]
17	<i>Cassia uniflora</i> (Caesalpinaceae)	Oneleaf senna	Sennosides A, B, C & D	Maybe due to Inhibition of histamine and PGs	Complete Freunds Adjuvant Arthritis	Antiarthritic	[12]
18	<i>Mytilus edulis</i> (Mytilidae)	Black Mussel	n-3 analogue of arachidonic acid, 7,11,14,17- eicosatetraenoic acid (20: 4n-3)	Inhibition of COX-1 and COX-2	Adjuvant induced arthritis	Antiarthritic	[13]
19	<i>Costus afer</i> (Zingiberaceae)	Ginger-Lily		Maybe due to Inhibition of PGs	Complete Freunds Adjuvant Arthritis	Antiarthritic and anti-inflammatory	[14]
20	<i>Bergenia stracheyi</i> (Saxifragaceae)	Elephant ears	Bergenin and Norbergenin	Decreases in lipophilic character O-demethylation	Adjuvant induced arthritis	Antiarthritic	[15]

Hydrotherapy is one of the oldest forms of treatment for patients with arthritis but the beneficiary of this treatment is very few. Podiatry deals with the importance of appropriate footwear provision for comfort, mobility and stability is well recognised in clinical practice but there is little evidence based research to support such observations in patients with early RA (Management of early rheumatoid arthritis a national clinical guideline, Scottish Intercollegiate Guidelines Network 2011). To overcome all these difficulties, the uses of natural remedies from plant origin were considered for safety, effectiveness and devoid of side effects which offers a novel opportunity.

The phytoconstituents derived from plants like flavonoids, terpenes, quinines, catechins, alkaloids, anthocyanins and anthoxanthins are potential against arthritis by modulating the expression of proinflammatory signals. Few natural remedies were addressed in Table No. 1:

Others:

Several other natural phytoconstituents have also been found to exhibit antiarthritic potential. For instance – Dihydrocucurbitacin B—the active principle of *Cayaponia tayuva* was justified its potential antiarthritic activity. J.M. Escandell et al. [16] found that Dihydrocucurbitacin B reduces chronic inflammatory response in the arthritic paws of female lewis rats. The mechanism of Dihydrocucurbitacin B is associated by modifying the cell infiltration and the expression of both Nitric Oxide Synthase 2 and CycloOxygenase 2.

Apart from the treatment of arthritis by natural remedies, it is utmost importance for the reliable assessment of parameters which is having a great potential to identify arthritis. One parameter namely Range of Motion (ROM) is of great clinical importance in arthritis patients. This measure describes the maximum flexion and extension measurements in a joint from a neutral angle. There are many readout systems to monitor the locomotion of the animals in the study. In the year 2011 Video graphic analysis was employed for the first time to describe the ROM in inflamed and noninflamed knee joints of freely moving rats¹⁷. Videoradiography is a digital high speed x-ray system. Radiographs were recorded with a sampling rate of 500Hz and a resolution of 1,530 x 1,024 pixels from the amplifier using a high speed camera (Speed cam Visario G₂, Weinberger Vision GmbH, Erlangen, Germany).

Conclusion:

Even though many treatments are available for the treatment of arthritis but they have their own drawbacks. In order to overcome these drawbacks the

conventional treatments are made replaced by the natural remedies which results in safety, effective, devoid of side effects, low cost and readily available. Few plants like *Curcuma longa*, *Zingiber officinalis* etc., shows promising effects against arthritis but with the other plants the well characterization of the extracts are required at the level of bioactive compounds to make the observations are valid and reproducible.

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