

Use of medicinal plants in rheumatology

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Objective: The use of medicinal plants by patients in the treatment of chronic diseases (diabetes mellitus, hypertension) is common in Morocco. Rheumatic diseases do not except from this informal and yet unknown therapeutic way. The objective of this work is to study the prevalence of the use of herbal medicines in rheumatology and the factors associated with this practice in the population of the region of Marrakech.

Patients and methods: This is a prospective study, 200 patients attending to two hospitals in Marrakech, for various inflammatory and degenerative rheumatic diseases were included, between August 2010 and March 2011. Hetero-administered questionnaire was used, including demographic data, type of plants used and the terms of their uses.

Results: Patients were represented by 163 women and 37 men. The use of medicinal plants was found in 78 patients (39%), including 60 women and 18 men, with a mean age of 50 years. We identified 49 different plants. Most used ones were the *Olea Europaea* L. *Nigella sativa* L. *Lavandula angustifolia* Mill. The information on these plants was given by friends and neighbours in most cases, the main expected effect was analgesic and the efficacy of these products was reported in 47.4% of cases. Plants were prepared by the patients themselves in 73% of cases, without prior instruction or knowledge of the terms of use. Adverse events were noted in 24.4% of cases. The use of plants was significantly higher in elderly patients, with more children out of school and having a major pain in the visual analogue scale (VAS).

Conclusion: The use of medicinal plants is quite common in rheumatology. However, we did not find an association between this practice and educational, social or economical levels of patients.

Key words: medicinal plants, pain, rheumatology.

Introduction:

Rheumatic diseases involve more than 150 different entities that induce a chronic suffering, with a multidimensional impact on all aspects of daily living. The chronic joint pains, the irreversible joint deformities and the functional troubles affect both physical and mental health of patients with serious socioeconomic impact. The use of complementary and alternative medicine (CAM) including herbal therapies, have become an increasingly prominent part of health-care utilization by the healthy general population and by patients with various diseases (Ramos-Remus & Raut, 2008; Aziza & Tey, 2009; Nissen & Evans, 2012). Frequencies of CAM utilization in rheumatic patients are very variable, between 18-94% in the United States, 60-91% in Canada, 56-83% in Mexico, 40-82% in Australia, 78% in Germany and 43-72% in India (Ramos-Remus & Raut, 2008). The use of medicinal plants by patients in the treatment of chronic diseases (diabetes mellitus, hypertension) is common in Morocco. In endocrinology 52% of patients declared using medicinal plant for glucose control (Errajaji et al., 2010). But, the frequency of its utilization in Moroccan rheumatic patients is not known. The aim of this work is to study the prevalence of herbal medicines utilization in rheumatology and to identify their different types used by the population of Marrakech and regions. The way the plants are made, their indications and the expected benefit to patients were identified. Also, the factors associated with this practice and its safety.

Materials and methods:

This is a prospective study, 200 patients attending to two hospitals in Marrakech (Avicenne military hospital and Ibn Tofail hospital), for various inflammatory and degenerative rheumatic diseases were included, between August 2010 and March 2011. Hetero-administered questionnaire was used. Several data were sought: in the first part there were the demographic characteristics (age, sex, marital status, the level of education...). In the second part there were data on the disease (diagnosis, the type and intensity of pain, the duration of the disease, the time of diagnosis, the current treatment and compliance, the economic level...). In the third part there were data on plants used (the name of the plant, the parts used, the method of preparation, the route of administration, the dosage, the source of the plant used...). The questionnaire was anonymous and patients were beforehand consenting. Statistical evaluation was carried out using SPSS 10.0. Student t-test and the Wilcoxon Manne Whitney tests were used for quantitative variables and Khi2 test for qualitative variables. The results of a p-value less than 0.05 were considered significant.

Results and discussion

Results

Patients were represented by 163 women and 37 men with a mean age of 48.38 ± 11.91 years. Patients were illiterate or have primary education in most cases (75%), living in a couple in 78.5% of cases,

had more than 3 children in 40% of cases and had low monthly family income in 38.5% of cases. VAS pain was moderate in 54.5% of cases; the pain was inflammatory in 45.5% of cases with morning stiffness in 68% of cases. The disease was degenerative in 51.1% of cases with disease duration average of 5.14 ± 5.71 . The duration of the disease progression was 5.14 ± 5.71 years. The delay in diagnosis was over one year in 24.5% of cases (Table 1).

Table 1. Epidemiological characteristics of patients

	Frequency (%)
Gender:	
Female	163 (81.5)
Male	37 (18.5)
Level of education:	
Illiterate and primary	150 (75)
Secondary and university	50 (25)
Marital status:	
Lives in couple	157 (78.5)
Lives alone	43 (21.5)
Number of children:	
≤3	92 (46)
>3	80 (40)
Education of children:	
Yes	154 (91.1)
No	15 (8.9)
Habitat:	
Urban	150 (75)
Rural	50 (25)
Monthly family income:	
<2000 MAD	77 (38.5)
2000-4000 MAD	92 (46)
>4000 MAD	31 (15.5)
VAS pain:	
1-4	62 (31)
5-8	109 (54.5)
>8	19 (9.5)
Type of pain:	
Mechanical	76 (38)
Inflammatory	91 (45.5)
Mixed	33 (16.5)
Presence of morning stiffness:	
Yes	136 (68)
No	64 (32)
Delayed diagnosis:	
<1 year	151 (75.5)
> 1 year	49 (24.5)

The patient knew his diagnosis in 44% of cases, has received an explanation for his illness in 43% and about his treatment in 42.5%. Eighty-seven percent of patients had analgesics, 75% had anti-inflammatory drugs (NSAIDs) and 28% had corticosteroids.

More than half patients (59.5%) considered their illness not treated well, 80% were observing their treatment. No adherence to treatment was due to ignorance in 35.9% of cases, to poverty in 53.8% and to forgetting in 5.1% of cases.

The use of medicinal plants was found in 78 patients (39%), including 60 women and 18 men, with a mean age of 50.4 ± 10.7 years. We identified 49 different plants (Table 2). Most used herbs were the *Olea Europaea* L. *Nigella sativa* L. *Lavandula angustifolia* Mill. There was a mixture of plants in powder used in 10% of cases with unknown composition in 91.3% of cases. The information on these plants was given by friends (33.1%) and neighbors (25.4%) in most cases. The mode of administration was internal in 65.8% and external in 34.2% (Table 3). The main expected effect was analgesic (54.7%). Efficacy of these products was reported in 47.4% of cases, opposite effect (worsening of pain) was found in 17% of cases and no effect in 36%. Plants were prepared by the patients themselves in 73% of cases, without prior instruction or knowledge of the terms of use. Adverse events were noted in 24.4% of cases. As worsening pain in 17.8%, stomach pain in 17.8%, dizziness in 10.7% and hypertension in 10.5% of cases. The cost of plants in dirham (MAD) ranged between 0 and 6610 MAD \equiv 0 – 593.45 EUR (an average price of 70 MAD \equiv 6.28 €). According to the expertise of the pharmacologist, 41% of patients were using the plant that would be useful vis-à-vis its virtues, and 15% of patients said that they were improved when they were taking the wrong plant (placebo effect).

After a univariate logistic regression, the variables found in connection with the use of medicinal plants with statistical significance are: age, number of children, schooling of children and the pain VAS (Table 4).

After a multivariate logistic regression, only gender and number of children seemed to be connected with the use of medicinal plants (Table 5).

Discussion

Herbal medicines are popular, self-prescribed treatments for rheumatic conditions (whatsoever inflammatory or degenerative). A recent US survey suggested that approximately 90% of arthritic patients use alternative therapies such as herbal medicines (Ernst, 2011; Kolasinski, 2012; Timothy et al., 2008). In a cohort of Australians with osteoarthritis, 69% used CAM with 11% using medicinal plants (Basedow et al., 2014). The frequency of use is more in India (30%) and Japan (40%) (Kolasinski, 2012; Jadhav et al., 2011). In Morocco, a recent multicentre study identifying the orally use of medicinal plants reported a prevalence of 28.6% (Atul et al., 2013). The use of medicinal plants was more prevalent in our study given the use of both topical and general ways (39%). Herbal

products are considered safe since they are natural, not considered drugs and of traditional use (Kolasinski, 2012).

Table 2. The most commonly used medicinal plants and their indication by patients in Rheumatic diseases

Specie	Local name	Part used and method of use	Indication	Frequency of use (%)
<i>Olea Europaea L.</i>	Zit Zitoun	Oil to ingest	Anti-inflammatory Analgesic Energy	10.5
<i>Nigella sativa L.</i>	Sanouj	Seeds in decoction	Anti-inflammatory Immunity Warming	10
<i>Lavandula officinalis Mill.</i>	Lakhzama	Leaf decoction	Anti-inflammatory Analgesic Antiseptic	7
<i>Anacyclus pyrethrum L.</i>	Tiguendest	Leaf decoction	Anti-inflammatory Analgesic	5.5
<i>Zingiber officinalis R.</i>	Skin jbir	Entire plant in decoction	Anti-inflammatory Tonicity	4
<i>Rosmarinus officinalis L.</i>	Azir	Entire plant in decoction	Analgesic Antiseptic	2.5
<i>Peganum harmala L.</i>	Harmel	Whole plant in fumigation	Anti-inflammatory Analgesic	2.5
<i>Eugenia caryophyllata L.</i>	Kranfel	Dried flowers in decoction	Anti-inflammatory Tonicity	2.5
<i>Nasturtium officinalis R.</i>	Hab rchad	Seeds to ingest	Anti-inflammatory	2
<i>Allium sativum L.</i>	Touma	Entire plant to ingest	Immunity Warming	1.5

Table 3. Mode of administration of medicinal plants

Mode of administration	Percentage
Internal administration:	
- Decoctions	21,4
- Infusions	13,2
- Medicinal oils	13,2
- Macerations	12,3
- Syrups	3,3
- Dyes	0,8
- Fumigation	0,8
- Suppositories	0,8
- Inhalations	0
External administration:	
- Medicinal oils	13,2
- Compresses	6,6
- Ointments	9,9

- Poultrices (cataplasms) 4,1

Table 4. Factors in connection with the use of medicinal plants in rheumatology (univariate logistic regression)

	P	OR (Odd Ratio)	IC (95%)
Age	0.052	1.025	1 – 1.051
Gender	0.185	0.615	0.3 – 1.262
Marital status: Lives in a couple or not	0.186	0.614	0.297-1.266
Number of children: ≤ 3 / > 3	0.004	2.526	1.353-4.717
Education of children	0.041	0.311	0.101 – 0.935
Level of education: Illiterate and primary / secondary and university	0.243	0.668	0.339-1.315
VAS pain: 1-4 / 5-8 / > 8	0.017	1.818	1.112-2.973
Delayed diagnosis: <1 year / > 1 year	0.296	0.696	0.353-1.373
Duration of disease progression	0.083	1.045	0.994 – 1.099

Table 5. Factors in connection with the use of medicinal plants in rheumatology (multivariate logistic regression)

	P	OR (Odd Ratio)	IC (95%)
Age	0.66	1.01	0.967-1.054
Gender	0.032	0.347	0.132-0.911
Marital status: Lives in a couple or not	0.423	0.574	0.148-2.234
Number of children: ≤ 3 / > 3	0.006	2.398	1.363-6.336
Education of children	0.123	0.379	0.111-1.301
Level of education: Illiterate and primary / secondary and university	0.917	1.056	0.38-2.934
VAS pain: 1-4 / 5-8 / > 8	0.376	1.3	0.727-2.325
Delayed diagnosis: <1 year / > 1 year	0.062	0.411	0.161-1.046
Duration of disease progression	0.07	1.065	0.995-1.141

Their low cost also makes them more accessible. Minimum wage in Morocco (since July 2011) is 230.80 MAD \equiv 200.28 €. According to our results, there was no difference regarding age, sex, education level, economic level or pathology and disease duration. That fact is found in literature in many countries (Ramos-Remus & Raut, 2008; Kolasinski, 2012; Basedow et al., 2014). In the present study, the main expected effect was analgesic and efficacy of these products were reported in 47.4% of cases. A literature review studies on herbal preparations commonly utilized in the treatment of rheumatic indications (Mills et al., 1996) showed that the investigation of the mechanism and the potential uses of herbal therapies is still in its infancy and many studies done to date are scientifically flawed (Mills et al., 1996 ; Shivaprasad et al., 2011; Hmamouchi et al., 2012; Porwal et al., 2016;

Gagnier et al., 2006; Kung Wu et al., 2015). Atul et al. revealed an antinociceptive activity of *Phyllanthus fraternus* L. in chronic inflammatory and persistent pain (Atul et al., 2013). In a study of a marketed product Dr. Ortho in India (containing extracts of different herbal medicinal plants including *Zingiber officinalis* R.) there were facts of mechanism in reducing arthritis induced inflammation (Setty & Sigal, 2005). Many studies tried to elucidate the immune pathways through which these preparations have anti-inflammatory and/or immunomodulatory activity and to provide a scientific basis for their efficacy (Mills et al., 1996; Setty & Sigal, 2005; Wirth et al., 2005; Krishnan, 2006; Zhang et al., 2011; Peng et al., 2010; Altman et al., 2008). The best known and also found in our study was the Gammalinolenic acid found primarily in vegetable oils (as *Olea Europaea* L.) and which suppresses inflammation by acting as a competitive inhibitor of prostaglandin E2 and leukotrienes (LTs) and by reducing the auto-induction of interleukin1 (IL-1)-induced pro-IL-1 gene expression. Furthermore, *Zingiber officinalis* R. is known to contain hundreds of known constituents, including gingerols, beta-carotene, capsaicin, caffeic acid, and curcumin. These constituents inhibit TNF- α , and leukotriene synthesis and are potent inhibitors of prostaglandin and LT synthesis. But at present, it has limited efficacy in the treatment of osteoarthritis (Mills et al., 1996; Shivaprasad et al., 2011; Watson et al., 1993; Belch et al., 1988; Jantti et al., 1989). Other plants were listed and studied, but there is great variability in the use of these medicinal plants which is primarily ethno geographic (Patrick et al., 1989; Halberstein, 2005). In the present study, 41% of patients were using the plant that would be useful vis-à-vis its known virtues, and 15% of patients said that they were improved when they were taking the wrong plant (placebo effect). The action of many of the herb-derived preparations can be affected by the extraction procedure utilized, dosage, duration of treatment, and the route of administration. In addition, there is a lack of uniformity of preparations. Patients prepared plants themselves in 73% of cases in our study, without any prior instruction or knowledge of the terms of use. Besides, adverse events were noted in 24.4% of cases. Patients using herbal therapy think that these plants are safe, in view of their natural source and ancestral use (Kolasinski, 2012; Halberstein, 2005). However, most of these plants had side effects, Gammalinolenic acid for example is responsible for headaches, soft stools, constipation, flatulence, and belching. *Zingiber officinalis* R. induces much more gastrointestinal side effects (Mills et al., 1996; Debbie et al., 2012; Tachjian et al., 2010). Neither patients nor their physicians are aware of these side effects or even the possible drug-plants interactions. The present study has many limits, as Selection bias: the study was conducted in hospitals with specialist consultation (serious illness, chronic poly medicated patients), small sample and the use of Hetero-administered questionnaire.

Conclusions:

The use of medicinal plants is frequent in rheumatology. More frequent in most painful patients regardless educational, social or economical levels of patients. The place of medicinal plants in the treatment of rheumatic diseases has not yet been clearly identified. But this prescription remains

informal with lack of traceability and non-compliance with dosage. Therefore, there is a great need to streamline this type of therapy.

Competing interests

The authors declare that they have no competing interests.

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