Original Article

Hospital-based study on the use of herbal medicine in patients with coronary artery disease in Jordan

Abdallah F Omeish, Wasfi Abbadi, Issa M Ghanma, Ziad Drabaa, Foad A Botoosh, Ahmad Seif, Monther Massadeh
Adult Cardiology Department, Queen Alia Heart Institute, Amman, Um Al Summaq, Jordan.

Abstract

Objective: To determine the frequency and pattern of herbal therapy use among patients with chronic coronary artery disease as self remedies.

Methods: This cross-sectional study was conducted by face to face interview of 690 consecutive patients visiting the outpatient department at Queen Alia Heart Institute during the period 1/6/2008 to 1/6/2009. Data was collected using a specially designed questionnaire.

Results: Overall frequency of herbal use was 14.1%. The most commonly used herbs in Jordan were hawthorn and ginger. A total of 27 local and one Chinese herbal product were used, while the use of adulterated formulae were absent. Pharmacists were never consulted regarding the quantity or frequency of herb use. Side effects were rare.

Conclusion: The use of medicinal herbs among cardiac patients in Jordan is not uncommon and consists largely of local herbs. Active role of pharmacists and doctors for counseling patients on the appropriate use of herbal products should prevent toxicity , ensure proper modes of preparation and optimize safety and efficacy.

Keywords: Herbal, Coronary artery disease, Hawthorn (JPMA 61:683; 2011).

Introduction

Herbal therapy (HT) use has been popular in the eastern region of the Mediterranean where it is frequently used for a variety of chronic diseases. However, it is noticed that knowledge of herbs is being gradually overwhelmed by western medicine, acquisition of different values by younger generations, and the death of elders before infusing this knowledge to future generations.[1]

Until this date, there have been few reports worldwide on the frequency of HT use among patients with coronary artery disease (CAD). Therefore, we decided to explore this area for determining the frequency and pattern of HT use in Jordanian CAD patients. Special emphasis was laid on the presence of several prevailing factors; including the lack of quality control for most available market preparations and major concerns regarding their potential side effects, toxicities, serious herbal-medicine interactions and the clear absence of appropriate counseling to patients.

Patients and Methods

This cross-sectional study was conducted by face to face interview of 762 consecutive patients (471 Male, 291 female), with history of chronic CAD, who visited all Tuesday out-patient cardiology clinics at Queen Alia Heart Institute (QAHI) during one year period from 1/6/2008 to 1/6/2009 . All patients with proven CAD by coronary angiography were included in the study. Exclusion criteria were patients with less than one year history of CAD because it was anticipated that many of these patients would not seek herbal medicine at this early stage of their disease. Cardiac patients visiting the clinic for pure valvular or arrhythmic reasons were also excluded unless having concomitant CAD. Additional twenty three patients were excluded due to incomplete data.

Data was collected using a specially designed questionnaire filled by seven cardiologists covering the clinic during the study period. Patients were questioned after getting their verbal consent, for all the following items: whether they use herbal medicine of any kind specifically for their CAD, and also for any other chronic illness. The name of the herb used as well as the frequency of its use and the benefit from it was asked. Who decided the frequency and dose of the herb, the physician, pharmacist or others was also questioned. Side effects experienced with its use and whether the patient would continue using the herb or not was enquired.

Univariate as well as multivariate analysis was carried out to explore the relation of HT use to fourteen pre-determined risk factors including age, gender residence area, educational level, smoking status, use of herbs for other chronic diseases, satisfaction with medical therapy, extent and duration of CAD, status of LV function, the presence or absence of diabetes or arterial hypertension and the presence or absence of past history of coronary bypass surgery. Results are awaited in the near future, which may help identify sectors to which educational herb programmes and

counseling should be directed.

The study was approved by the local ethical committee of Royal Medical Services.

Results

It was found that 97 (77 males, 20 females) out of 690 (471 males, 291 females) interviewed patients used herbal products specifically for their heart, leading to an overall frequency of 14.1%. The mean age for the study population was 57.4±13.5 years in males and 62.1±12.8 years in females. The results revealed that a total of 27 local herbs as well as one additional Chinese herbal product were used by the interviewees. The two most common herbs were Hawthorn and Ginger used by 51 (52.6%) and 17 (17.5%) patients respectively. Both herbs were used as mixtures in 15/51 (29.4%) and 6/17 (35.3%) of their consumers (Table-1,2). Other less common herbs used (each used by more than two patients) were; Germander, yarrow, wormwood, apple, garlic, nigella, clove, linnseed, Olea europaea leaves, melissa, fenugreek and rosemary (Table-1).

All other herbs accounted for the remaining 14.4% of

Table-2: Herbs used in different Hawthorn mixtures (n=15).

Herb	Number of patients	Herb	Number of patients
Ginger	3	Linseed	1
Vinegars (2 garlic, 1 apple)	3	Loquat leaves	1
Clove	3	Egyptian clover	1
Wild thyme	1	Saffron	1
Olea europa leaves	1		

Table-1: Commonly used medicinal plants for the treatment of chronic coronary artery disease (n = 690).

Medicinal Plant	Frequency	Comments
Hawthorn	36	
Hawthorn + other herbs	15	3 with ginger, 12 with other herbs(table 2)
Ginger only	11	
Ginger + others	3	2 with Nigella, 1 with Basil.
Ginger+ Hawthorn	3	
Mixtures(Germander+Yarrow+Wormwood)	4	Consistent mixtures involving the three herbs in these patients.
Wormwood alone.	1	
Germander alone.	1	
Apple, Garlic (as vinegars)	5	4 apple and 1 garlic.
Both in Hawthorn mixtures	3	
Garlic as dried fruit	1	
Nigella	3	Mixed with hawthorn in 2 patients, alone in 1 patient.
Linnseed, Olea europa leaves	4	Each herb was used by 2 patients.
Mellisa, Fenugreek, Rosemary	6	Each herb was used by 2 patients
Clove	3	All within hawthorn mixtures.
Miscellaneous: Sage, Dandelion ,Hibiscus ,Green tea, Basswood, Cabbage, Lupin, Lotus, unknown Chinese herb, Wild thyme, Loquat leaves, Egyptian clover, Saffron, Basil.	14	One herb was used by each patient.

Table-3: Miscellaneous data.

Advised by	Friend	Relative	Physician	Herbalist	Others
Nº	47	39	3	2	1
%	48.4	40.2	3.1	2.1	1%
Duration	< 30 days:	1-12 months	> 1 year		
Nº	25	48	24		
%	25.7	49	24.7		
Frequency	Regular	Intermittent			
Nº	42	55			
%	43.2	56.7			
Method of	Relative	Friend	By himself	Herbalist+ Dr	Others
use	43	26	19	8	1
Avised by	44.30%	26.80%	19.60%	8.20%	1%
Benefit percepted	Yes	No	Less SOB: 31 pts.		
Nº	55	42	Less pain : 27 pts.		
%	56.70%	43.30%	Mixed : 39 pts.		
Will continue using them	Yes	No			
	55	42			
	56.70%	43.30%			

SOB: Shortness of Breath.

the used herbal remedies where each was taken by one patient only. It was noticed that one Chinese herbal medicine (name not known by the patient) was used by one patient while the use of adulterated formulas was absent.

Regular use was reported by 42 (43.2%) patients while long term use > 1 year was recorded in 24 (24.7%) patients. The patients used herbs according to advice from their friends and relatives. Pharmacists were never consulted regarding the quantity or frequency of herb use, whereas herbalists, television and satellite programmes and treating physicians had minimal impact. With HT use, benefit was reported by 65 (67%) patients, of whom 55 (56.7%) admitted that they would continue using them. Side effects were experienced only with hawthorn and were reported in four patients (Table-3).

Discussion

Coronary artery disease is the leading cause of cardiovascular mortality worldwide, with more than 4.5 million deaths occurring in the developing world. Despite a recent decline in developed countries, both CAD mortality and the prevalence of CAD risk factors continue to rise rapidly in developing countries, probably due to social and economic reasons physical inactivity, an increase in cigarette smoking, or Westernized diets.[2]

Interest in use of complementary alternative medicine (CAM) has increased in the past decade. This is mainly derived due to the high cost of conventional therapy, advice and pressure of the community and the belief in alternative modalities. According to one estimate, >80% of the developing world's population still depends on CAM, versus about half of the population in industrialized countries.[3]

Herbal medicines are common alternative modalities used by communities,[4,5] and in treating several chronic diseases including diabetes mellitus,[6-8] systemic hypertension,[9] cancer,[10,11] chronic liver disease,[12] chronic asthma and utrticaria[13] and chronic kidney disease.[14] Yet, few studies have been focused on patients with chronic coronary artery disease at outpatient clinics.[15-17] In fact, our series remains the largest followed by Pharand et al and Yelmiz et al , who enrolled in their surveys only 226 and 151 cardiac patients respectively.[15,16]

Herbal medicines may protect against cardiovascular diseases by contributing to the total antioxidant defense system of the human body. Antioxidants are compounds that protect cells against the damaging effects of reactive oxygen species ROS, such as superoxide, hydrogen peroxide, singlet oxygen, peroxyl radicals, hydroxyl radicals and peroxynitrite. Flavonoids, for example, are groups of herbal antioxidants that are inversely related to mortality from coronary heart disease and to the incidence of heart attacks.[18] Unfortunately, the actual dose of active ingredients in medicinal herbs is often variable, unpredictable or simply unknown .

The use of HT among CAD patients in Jordan was not uncommon, with a frequency of 14%. This figure is lower than those reported by Jouad et al in Northern Morocco (76%),[17] Yimiz et al in Turkey (38.7%)[16] and almost similar to that of Pharand et al (overall frequency 17% in Canada , 25% in central Canada).[15]

Similarly, our frequency was less than those reported, by Al-Saeedi et al,[6] Otoom et al[7] and Johnson et al[8] (30%, 30% and 90% respectively) in diabetic patients, by Olissa et al[9] in hypertensive patients (24%) and by Kara et al[14] (28%) in patients with chronic kidney disease.

On the other hand, our frequency corresponds to those reported, by Hasan et al[19] (16%) in patients with chronic diseases at outpatient clinics in Malaysia, by Molossitos et al[11] (14%) in patients with lung cancer, by Strader et al[12] (13%) in patients with chronic liver diseases, and by Kurt et al[13] where 12.5% patients with bronchial asthma and urticaria reported HT use.

The number of medicinal plants cited by our respondents to be used as CAD-specific herbs were 28, far beyond those reported by Jouad et al[17] in Northern Morocco (11 plants). Many of these local Middle Eastern remedies had never been properly explored, or evaluated compared to Chinese or western medicines.[1]

Many known cardiovascular herbs in Arab as well as Jordanian folk medicine were not used by our respondents, mostly reflecting poor knowledge by patients and/or poor counseling by health care providers. Examples of such herbs are: Florence fennel (Foeniculum vulgare), Ammi (Ammi visnaga), Hail-Cardamon (Eucalyptus globules), Carob (Ceratonia Siliqua), Horsetail (Equisetum arvense), Nettle (Urtica dioica), Pomegranate (Punica granatum), Chamomile (Matricaria chamomilla), and Cayenne (Capsicum frutescens).

Moreover, most of the herbs reputed for diuresis in the Middle East region, were not used by our participants, despite that nearly half of them had impaired LV function (337 from 690). These herbs include: common nettle (Urtica dioica), garden cress (Lepidium sativum), elder (Sambucus nigra), muskmelon (Cucumis melo) , andean Horsetail (Equisetum arvense), coriander (Coriandrum sativum), and anise (Piminella anisum), which again confirms loss of knowledge by younger generations, as suggested previously by Azaizeh et al.[1]

Most of the herbs in our study were consumed orally in the form of tea or other drinks and were diluted empirically without supervision. Few patients used various parts of the herbs through direct ingestion of seeds (like nigella, linseeds,

and lupin), leaves (saffron, dandelion, Egyptian clover and cabbage), roots (fennel and dandelion), bulbs (garlic) fruits (jujube), and oil (hawthorn).

Mixtures were prepared randomly upon hearsay and used in 23/97 patients (23.7%) without any scientific basis. Participants relied heavily on family, friends and local herbalist "Attar" for advice, in contrast to what was reported by Pharand et al[15] in Canada, where 50% consulted their pharmacist regarding the use of these herbs. In fact, several odd recommendations were passed to the customers by different herbalists in our study, indicating that they are mostly uneducated in the field of herbal medicine .

The active role of pharmacists and doctors for counseling patients on the appropriate use of herbal products should yield important improvement in the quality of care. Education in herbal products should be available and encouraged for all patients and health care providers. Physicians may need to acquaint themselves with at least the common herbs used by their patients and they should not be offended, when the patients consider them for use. On the other hand, the pharmacist's role should be activated to avoid any unnecessary use, dangerous toxicity and interactions, also to decide the effective dose and frequency of the mixtures. To achieve this, pharmacy schools should include teaching of herbal medicines in their curricula.

The commonest herbs used by our participants were hawthorn followed by ginger. It is to be noted, that none of these two herbs was ever ranked as one of top two in any previous ethno botanical surveys for herbal therapy (HT) in chronic diseases.

The effectiveness of hawthorn preparations (flowers, leaves, oil and berries) as cardiotonic, coronary vasodilator, peripheral vasodilator and anti-arrhythmic, is documented in a number of clinical studies, reviews and meta-analyses.[20]

The recommended doses for hawthorn extracts have been described but unfortunately widely variable. Meanwhile, it was found that the unsupervised use of this drug could be associated with problems, especially if given with concomitant medications.[21] Fortunately, side effects were rare in our participants despite the imprecise frequency and dosage consumed. Side effects were reported only in four patients, which may be due to underreporting.

Similarly, the cardiotonic, anti-oxidant, anti-lipidaemic anti-artherosclerotic and blood thinning properties (inhibition of thromboxane synthetase) of ginger have been published and proved in the medical literature.[22]

Both hawthorn and ginger are available at cheap prices in the market and are sold by herbalist's shops without restriction. However, the cost of some new formulas such as hawthorn oil, which is imported, may be equal to that paid for purchase of expensive conventional drugs. The average cost per month for purchasing hawthorn oil in Jordan is 25 JD's (35$ US dollars).

Interestingly, Chinese herbs and formulae were not used except in one patient (missing label), and that was mostly due to their high cost in the country or simply because they are unknown to the public, while the use of adulterated formulae were completely absent.

Shengmai, American, Asian ginseng and Grape seed proanthocyanidins extract (GSPE) Vitis vinifera L. are popular herbal supplements in patients suffering from cardiovascular disease in the US.[23] All these herbal products were not used at all by our respondents, while green tea extract which has been shown to protect against cardiovascular in several in vitro and in vivo models had been used once.

Sorted by its antioxidant content, clove (Eugenia caryophallata) has been found to have the highest mean antioxidant value, followed by peppermint, cinnamon, oregano, thyme, sage, rosemary and saffron.[24] In our trial, Clove (always mixed with hawthorn) and rosemary were used in three and two patients respectively. Wormwood and Germander (4 mixed with Yarrow, one alone) were used, each in five patients equally. These herbs are quite abundant in Jordan desert and therefore easily harvested by local people.

Habbatul-Baraka (Nigella sativa), regarded in Islam (the dominant religion in Jordan and the whole Middle East) as one of the greatest forms of healing herbs, is increasingly recognized as a potentially promising approach in prevention and treatment of heart failure as well as for its hypotensive effects.[25] In our series, Nigella sativa was used only by 3 patients (2 mixed with ginger, and one alone), despite that it has long been used in the Middle East and Far East as a traditional medicine to promote health and fight disease.

The main active ingredient in the olive leaf was reported to be oleuropeoside, which disclosed a distinct hypoglycaemic effect, hypotensive and hypolipidaemic properties . Doses as high as 1200 mg/kg for 60 days in rats were completely atoxic with no resultant side effects. Olive leaves were used only by two patients for cardiac symptoms relief, despite that Olea europea tree is widely cultivated in Jordan and that more than 50% of our respondents had diabetes.

Dry garlic fruits (Allium sativum) were used only by one patient, otherwise garlic was consumed as vinegar similar to apple fruits (Malus domestica). Vinegars of garlic and apple were used by 8 patients (5 alone and 3 mixed with hawthorn) in our study (8.2% of patients). In contrast, the most common herbal product in patients with cardiovascular disease in Canada for example is garlic.[15] Considerable

evidence indicates that allicin is essential to garlic's hypolipidaemic and antithrombotic effects. However, it cannot be ascertained whether garlic vinegar maintains the same cardiovascular effects of garlic as in the case with fresh and aged garlic extracts .

Except for Trigonella foenumgraecum (2 patients), Allium sativum (4 patients) Nigella sativa (4 patients), Olea europea L. (2 patients) and Tilia cordata (1 patient), herbs that were shown to be commonly used by Jordanian diabetics[7] had not been similarly used by our cardiac diabetic patients and includes: Allium cepa, Zea mays L. Urtica dioica L. Eucalyptus globules LA, Cumminum cyminum Coriandrum sativum and Salvia officinalis L.

Less popular drugs used by our respondents for the treatment of angina pectoris or heart failure in patients with CAD included 14 herbs (Table-1). As to whether these herbs really work remains unknown, as there are not enough randomized and controlled studies to document their effectiveness. Our understanding of the scientific principles of these herbal drugs is still far from satisfactory .

Long-term use of herbs beyond one year was rarely sustained (25%) in our study population. Intermittent rather than regular intake of the herbs, reflects poor knowledge and advice, which was mostly offered by friends and herbalists as shown in Table-3. With HT use, benefit was percepted in 65 (67%) patients, of whom 55 (56.7%) patients admitted that they would continue using them.

Our center at QAHI; a tertiary care medical facility, receives referrals from all provinces in Jordan, hence, should reflect the true frequency among all Jordanians. However, our study was conducted only among the outpatients and hence may not be generalizable to the overall CAD population.

To our knowledge, this is the largest ethno-botanical survey that has ever been carried out in CAD patients. We can conclude that HT use is not uncommon in our population and consists largely of plants that constitute the traditional local herbs. Education in herbal products should be available and encouraged for all patients and health care providers, in order to enhance benefit and safety of HT and obtain a unique and affordable health care system. Further analysis of our data in the future, would hopefully be able to identify sectors to which educational herb programmes and counseling should be directed.

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