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The use of herbal and medicinal plants for the treatment of dyslipidemia seen by herbalists and dyslipidemic patients in the Nabeul region of Tunisia's Cap Bon

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Introduction: The dyslipidemia is one of the most common problems of public health. The pharmacology only has not always demonstrated absolute efficiency in the support of this disease and it has proved that certain complementary measures were useful to take between other dietetic and phytotherapy. **Material and methods:** For the purpose of assessing the perception of hyperlipimiant subjects in relation to the use of phytotherapy and dietetics in the support of their illness a survey was conducted over 150 patients taken at random during the consultation at the clinic El haouaria in the gouvernrate of Nabeul to assess the knowledge on plants lipid lowering drugs and their places in the food habits from dyslipidimiques and 15 traditional healers in the souk El balgha in Nabeul in order to gather the knowledge concerning the plants which are frequently recommended in the treatment. **Results:** The majority of investigated hyperlipimiant subjects were aged women mostly illiterate ones. The survey has enabled us to select a dozen medicinal plants to treat dyslipidemia, but sometimes within bad practices of traditional medicine because of the insufficient knowledge of the sick and the herbalists. Among the plants used by dyslipidemic surveyed to treat their disease we quote garlic, apples and fenugreek. The majority approve the importance of diet in the treatment. **Discussion:** Respondents patients showed interest in diet and herbal medicine. Moreover, we believe that this attitude is adopted firstly because of too high cost of drugs to a population with low socioeconomic level or average and secondly these patients have disgusted the long-term use of drugs. The plants are prescribed in the same way to all dyslipidemic patients, regardless of the type of dyslipidemia presented by the patient. It can result a product of delay elimination and accumulation in the body leading to the occurrence of side effects. **Conclusion:** The phototherapy occupies an important place in the region of El Haouaria. This traditional medicine offers us several perspectives, and opens the way for research that can be promising. It is an invaluable and inexhaustible source of information that must be exploited. Traditional herbalists should be trained to avoid possible toxicities from prescribed plants.

Keywords: Herbal medicine, diet, dyslipidemia, traditional medicine

INTRODUCTION

Cardiovascular disease is a serious health problem and a leading cause of death and disability worldwide and dyslipidemia are major parameters of cardiovascular risk. Dyslipidemia are defined as a change in one or more lipids (cholesterol (CT), triglycerides (TG)) outside the bounds of the usual values identified in a given population (Couvert et al, 2010). According to the World Health Organization, dyslipidemia were responsible for nearly half of the deaths caused by Cardiovascular Disease, thus representing 3.2 million deaths per year and 38.2 million years of life lost due to premature death (Alan et al 1996). In Tunisia, the prevalence of hypercholesterolemia (CT > 6.2 mmol / L) is 8.4% and hypertriglyceridemia (TG > 1.70 mmol / L) is 21%. The prevalence of high limit cholesterol (5,2 < CT < 6.2 mmol / L) is 17% (Essais et al, 2009).

Clinically, the results of numerous epidemiological studies and large intervention trials, carried out for many years, have shown that it is possible to reduce the incidence of cardiovascular diseases through dietary lipid-lowering therapy, or herbal medicated.

The plants were the main source of raw material, but replaced by chemical synthesis which became almost unique and inexhaustible source of drugs, but given the increase in adverse effects of synthetic drugs and the very high cost of certain pharmaceutical products, we seeing increased use of plants and natural products. Today, herbal medicine is based both on tradition and on scientific research conducted in accordance with official standards of modern medicine (Barnes et al, 2002). Currently in Tunisia, there is some chronically ill patients use herbal medicine in substitution to drug treatment firstly to research a possible quick relief and secondly to deal with costs increasing high medication. However, the tendency of subjects with chronic illnesses to use traditional medicine and herbal medicine could have negative health implications if these individuals do not have sufficient knowledge about the daily doses to consume, methods preparation and ingestion. An overdose of use could become toxic. These useful information for patients using this treatment are generally provided by traditional herbalists who themselves have not received any specific training and have acquired this profession by heredity from father to son.

The objectives of this study were to investigate the dyslipidemic patients perception of using herbal medicine to treat this disease and to assess the prescribing method of plants by traditional herbalists to these patients.

MATERIALS AND RESEARCH METHODS

This is a cross-sectional study that was conducted in two phases.

The First phase is a survey of 150 dyslipidemic which 70 are women. These subjects were recruited randomly during outpatient Metabolic Diseases Hospital "El Haouaria" in the region of Tunisia Cap-bon. After explaining the objectives of the work, the recruited patients have agreed to voluntarily participate in our survey. Data collection was done using a questionnaire that was presented in a manner directed and individually to each subject by a student intern Sciences preformed Nutrition.

The questionnaire consists of different parts that concerning the identification of the patient, the age of dyslipidemia, knowledge with respect to complications of the disease, the patient's attitude towards the use of plants and herbal medicine . Questions also were raised about the different plants used for patients who have used this model of treatment and the prescriber of the plants used.

- The second phase is a survey of 15 traditional herbalists recruited from the " Souk El balgha" in Nabeul . It is the place shops that bring together sellers of traditional medicinal plants. After explaining the objectives of our study, these herbalists have agreed to voluntarily participate in this survey. For data collection, a questionnaire was presented to respondents so directed by a student in Nutritional Sciences.

The different parts of the questionnaire concern mainly the different plants that the herbalist prescribed to patients who come to visit, sources of documentation used to prescribe the dosage, method of use and the treatment period.

Statistic Analysis

Statistical analysis was performed using SPSS 15 software.

For the comparison of averages we used the student test. The comparison of percentages was made using the chi-square test of pearson and in case of non-validity of this test; we used the Bilateral Fisher exact test. The significance level is considered when $p < 0.05$.

RESULTS

The average age of men surveyed is (60.2 ± 11.5) years vs (62.6 ± 10) years for women ($p=0, 37$).

As shown in Figure 1, about 1 in 3 among respondents is illiterate and 25% have a higher level of education.

Regarding the employment status of the respondents, 68% are unemployed, 13.3% are civil servants, 10% have a liberal function and only 1.7% is senior executives.

The average seniority of dyslipidemia among respondents was (9.7 ± 3.09) years for males and (10.3 ± 2.8) years for women ($p=0.21$).

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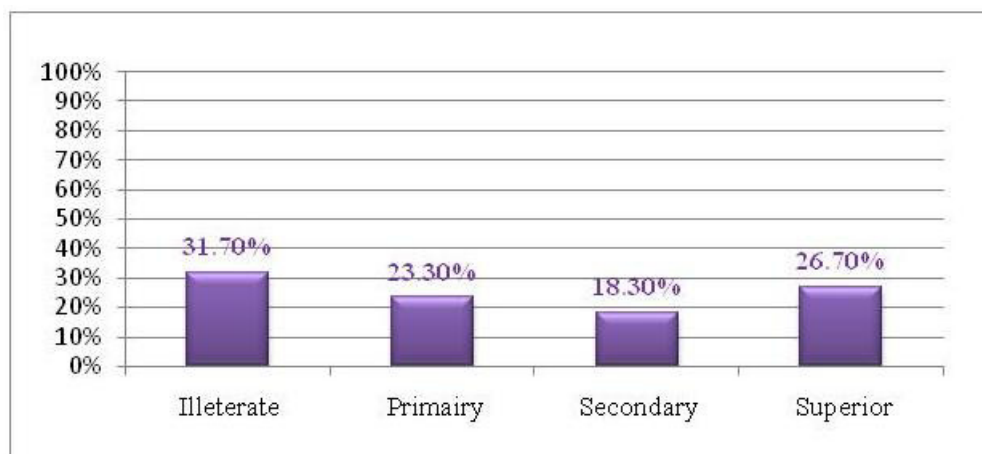


Figure 1: Distribution of respondents according to education level

Table 1: Knowledge of respondents about the complications of the disease

complication cited	Men	Women	p
Hypertension	76 %	83 %	0,31
Obesity	16 %	52 %	< 10 ⁻³
Myocardial Infarction	16 %	11 %	0,4
Cerebrovascular accident	100 %	70 %	< 10 ⁻³
Bladder Calculi	4 %	3 %	0,8

Regarding Patient's knowledge about the possible complications of dyslipidemia, we found that in both sexes, the majority of patients said the Hypertension and cerebrovascular accidents. The table1 shows the various responses of the surveyed patients. We also note from these results, that approximately one woman among both cited obesity as a possible complication of dyslipidemia, whereas this complication was cited by only 16% of men.

The answers of the respondents about their attitudes towards the use of plants and herbal medicine to treat dyslipidemia showed that 80% of men and 77% of women find that traditional plants are useful in the treatment of dyslipidemia. According to the education level, 72.7% of respondents with low educational level against 85.2% with

a satisfactory level approve the utility of traditional plants in the treatment of dyslipidemia.

Furthermore, we sought in our investigation to know who among dyslipidemic in practical use plants for the treatment of their disease. The Table 2 shows the list of plants frequently used by dyslipidemic subjects of both sexes to reduce their serum cholesterol and triglycerides.

The results in Table 1 show that there is no match between the attitude and patient practices. Those who had a positive attitude to the use of plants to treat dyslipidemia are not all in the process of realizing this attitude. We note further that among users of plants, the garlic and the apples are most used by both sexes. However, Fenugreek,

Table 2: List of plants frequently used by dyslipidemic patients to treat their disease

Plants	Men	women	p
Garlic	36 %	37 %	0,9
Apples	37%	25 %	0,12
Fenugreek	8 %	19 %	0,04
The olive leaves	1 %	9 %	0,08
Apple Cider Vinegar	2 %	9 %	54

Table 3: Prescribers of dyslipidemic plants to patient's users.

Prescribers	Men	Women	p
Doctor	8 %	6 %	0,9
Traditional Herbalist	46 %	57 %	0,18
Other patient dyslipidemic	38 %	23 %	0,05
Personal decision	8 %	14 %	0,17

Table 4: Follow a diet as adjuvant to herbal

Follow the diet with traditional plants	Men	Women	p
Regulary	20 %	28 %	0,22
Rarely	52 %	54 %	0,8
Never	28 %	18 %	0,19

olive leaves and apple cider vinegar are more used by dyslipidemic women.

The different prescribers and possible sources of information about the plants used by dyslipidemic subjects of both sexes are shown in Table 3.

The results in Table3 show that for the majority dyslipidemic men and women using plants to treat their illnesses, traditional herbalist are their main prescribers. We also conclude that men have more recourse to herbal medicine based on other dyslipidemic subjects experiences compared to women.

We asked the patients who use traditional plants for the treatment of their disease to express their attitudes with

respect to monitoring a diet as adjuvant to phytotherapy. We found that 87.5% of men and 91.4% of women find this very useful while others do not agree. However, Table 4 shows that, in practice and despite the positive attitude to follow diet as adjuvant to herbal medicine, the majority of these patients do not regularly use this diet.

The survey Herbalists

The second part of our work was an ethno botanical survey conducted in Herbalists.

Through this survey, we tried to list the particular plants that are prescribed by these traditional specialists, know the local name and the common name, the plant parts used, methods of use and the prescribed doses. The

Table 5: Key plants prescribed by herbalists for dyslipidemic patients

plants	Scientific name of the plant	Used Part of the Plant
White Marrubium	Marrubium Vulgare.L	Stem and leaves
White Artemesia	Artemesia herba alba	Stem and leaves
Olivier	Olea europa	leaves
Ginger	Zingiber officinalis	rhizome

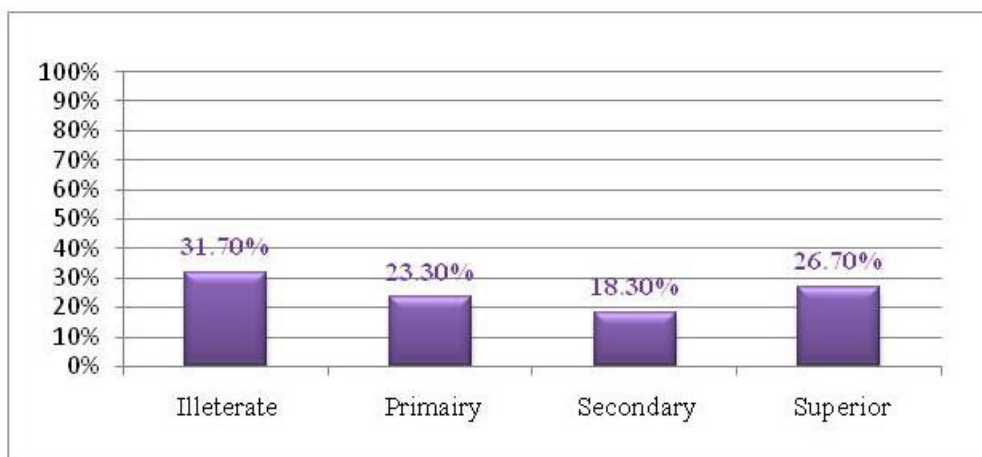


Figure 1: Distribution of respondents according to education level

average age of herbalists is (49.9 ± 8.975) years. For the majority of herbalists (67%), they see patients who come looking for plants only during the first visit and so they do not melt the monitoring and control of the effectiveness of the prescribed treatment.

It is clear from Figure 2 that the majority of herbalists have not received training in the field of traditional medicine. Similarly, we note that about one Herbalist from three prescribed plants by heredity from father to son. In addition, Table 5 summarizes the principal plants cited by herbalists and that they prescribe for dyslipidemic patients who visit them for treatment.

DISCUSSION

Despite the remarkable progress achieved through prevention, pharmacological treatments and surgery,

cardiovascular diseases still remain a major cause of mortality both in men than in women and dyslipidemia is one of the risk factors major on which we can intervene.

Dyslipidemia represent a serious health issue and therefore a significant cause of premature mortality, morbidity and health expenditure.

Clinically, the results of numerous epidemiological studies and large intervention trials, carried out for many years, have shown that it is possible to reduce the incidence of cardiovascular diseases through dietary lipid-lowering therapy, or herbal medicated (Thompson Coon and Ernst, 2003). The different forms of therapies should be complementary and not competing. In this work, we will evaluate the perception of dyslipidemic patients vis-à-vis the dietary management of dyslipidemia and herbal and identify plants used.

To meet this objective we realized a survey nearby a few herbalists in Souk El balgha in Nabeul and another with

150 dyslipidemic patients in hospital El Haouaria in the governorate of Nabeul. Our main results in dyslipidemic patients showed that the average age of men surveyed is (60.2 ± 11.5) years vs (62.6 ± 10) years for women ($p=0, 37$). About 1 in 3 among respondents is illiterate and 25% have a higher level of education. Regarding Patient's knowledge about the possible complications of dyslipidemia, we found that in both sexes, the majority of patients said the Hypertension and cerebrovascular accidents.

Furthermore, concerning the attitude of dyslipidemic patients surveyed with respect to the use of herbal medicine and traditional plants to treat their disease, the answers of the respondents showed that 80% of men and 77% of women find that traditional plants are useful in the treatment of dyslipidemia. According to the education level, 72.7% of respondents with low educational level against 85.2% with a satisfactory level approve the utility of traditional plants in the treatment of dyslipidemia. Despite this positive attitude towards the use of traditional plants, in practice the number of patients who actually uses of plants is lower than that of those with this attitude. The most frequently used foods according to the survey are respectively garlic, apple, fenugreek and olives. "Garlic" is the food as fast and well appreciated by most patients as lipid-lowering diet.

In order to assess the lipid-lowering action of garlic, several trials (Schlienger 2007, Rasul Suler et al 2015, Mikaili et al 2013) tested were made in humans in conditions highly variable and for a limited period. A systematic review involving 10 randomized controlled trials, selected from 18 studies published before 2000, sought to establish the reality of the lipid-lowering action of garlic in healthy subjects with moderate hypercholesterolemia. The authors conclude that garlic can substitute for lipid lowering offered in allopathy. Its use may be tolerated but not recommended as an alternative treatment.

Second, the apples were cited as an adjunct to drug therapy to treat dyslipidemia in 37% of men and 25% women with dyslipidemia. Indeed, botanists have shown that the apple tree whose Latin name is *Malus communis* may be indicated for the treatment of dyslipidemia, diabetes, constipation and anemia without adverse effects (Bezanger-Beauquesne et al 1986, Oukabli 2004). Some respondents dyslipidemic patients use fenugreek to treat their dyslipidemia. A survey (Khlifi et al 2013) conducted among a Tunisian population of type 2 diabetics to evaluate the effect of Fenugreek on serum lipid profile. The authors found a significant decrease in levels of triglycerides. Fenugreek whose Latin name is *Trigonella foenum graecum* is a nutritious herb that has several important pharmacological properties. It has been shown that the fenugreek seeds may be indicated for the treatment of dyslipidemia, diarrhea and diabetes. But its long-term indication should be cautious especially in pregnant women and non-pubescent children. (Brummera

et al 2003, Abu saleh et al 2006, Ghedira, Goetz 2010). A minority of respondents dyslipidemic use apple cider vinegar.

An experimental study was conducted to evaluate the impact of apple cider vinegar on some biochemical parameters in rats subjected to a high fat diet showed that taking apple cider vinegar can correct some metabolic disturbances linked to consumption a high fat diet by reducing hyperglycemia and hypercholesterolemia (Bouderbala et al 2014). Respondents patients showed interest in diet and herbal medicine. Moreover, we believe that this attitude is adopted firstly because of too high cost of drugs to a population with low socioeconomic level or average and secondly these patients have disgusted the long-term use of drugs.

The results are consistent with those of a cross-national epidemiological survey conducted in patients with dyslipidemia in France in 2004 and whose main objective was to describe the adherence of dyslipidemic patients *hygiénodietétiques* rules associated with the cholesterol-lowering treatment according to their socio-demographic and clinical profile (Allaert 2004). The results of the survey herbalists have shown that they have not received any specific training on medicinal plants. Indeed, traditional healers are inspired by ancestral practices passed down from generation to generation, the conduct of the Prophet (QPSSSL) sometimes works written in Arabic they buy at low prices and in which are transcribed the therapeutic virtues of plants and other medical care. We found that the plants are prescribed in the same way to all dyslipidemic patients, regardless of the type of dyslipidemia presented by the patient. He can result a product of delay elimination and accumulation in the body leading to the occurrence of side effects. Similarly, these traditional caterers do not know the exact doses to prescribe and way of storing prescribed plants. This method of doing things, could induce toxicities. The processing time is, in most cases, inaccurate. The treatment is generally continued until clearance. The time of his arrest is considered by the patient himself, based on the attenuation or disappearance of symptoms.

CONCLUSION

Dyslipidemia are very common metabolic diseases and their treatment depends on accurate diagnosis of dyslipidemia. But reducing the risk of stroke subjects concerned also needs to assess this risk. Herbal medicine has been and remains an essential component of the therapeutic arsenal. Phytomedicines derived from plants proposed make it possible firstly to contribute in the treatment of dyslipidemia and secondly its prevention by incorporating these plants in our eating habits. While these traditional plants showed positive effects in the treatment of

several pathologies, their prescriptions by untrained herborists could potentially present a health risk if misuse.

This traditional medicine offers us several perspectives, and opens the way for research that can be promising. It is an invaluable and inexhaustible source of information that must be exploited. The mastery of these data can only be acquired through a university education provided by the Faculty of Pharmacy and the Faculty of Medicine. This should lead to professional competence which opens the way to real daily practice of clinical herbal medicine with safe and effective use of medicinal plants.

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