




Research Article

Frequency and importance of herbal use among presurgical patients: A prospective cohort study

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ABSTRACT

Aim: Herbal medicine has been used by humankind since ancient times. However, its popularity has increased in the last 20-30 years. In addition to the production, presentation and marketing of herbal medicines, their effects on the body are also very complex. Uncertainty about the effects of these drugs on the body has increased the importance of pre-anesthetic evaluation. To determine the frequency of herbal drug use in patients presenting for preoperative evaluation and to highlight its importance in anesthetic practice.

Method: It was designed as a prospective study with observational-analytical character. Patients over 12 years of age presenting to the Anesthesia Outpatient Clinic of our hospital for pre-anesthetic assessment were interviewed about their use of herbal medicines for 2 months. Patients who used herbal medicines were asked about the medicines they used.

Results: A total of 2712 patients were evaluated. Of the patients attending the outpatient clinic, 2367 were over 12 years of age. The use of herbal drugs was found to be 1.18% (n=28). Among the patients who used herbal medicines, 53.6% were female and the mean age was 52.18±15.87 years. The most commonly used herbal medicines were black cumin, green tea, ginger, turmeric, cinnamon, and olive leaf.

Conclusions: The use of herbal medicines may be much higher than detected in patients presenting for pre-anesthetic examination. As the effects of herbal products are very uncertain, they may interact with anesthetic drugs. They can prolong bleeding time, increase blood pressure and cause heart problems. For these reasons, they should be closely questioned in the pre-anesthetic examination and discontinued before surgery.

ARTICLE INFO

Article history:

Received 22 September 2023

Revised 16 October 2023

Accepted 16 October 2023

Keywords:

Anesthesia

Herbal medicine

Preanesthetic examination

Presurgical patients

1. Introduction

Before the development of modern medicine, patients sought treatment from traditional healers using various herbs and chemicals that could be obtained under the conditions of the time [1]. Despite the development of modern medicine, the search for alternative medicine continues today. Applications of alternative medicine are found in almost every field, including pain, nutritional support, medical treatment, psychotherapy, rehabilitation, and even alternative medicine is involved in

diseases that fall within the field of surgical sciences [2]. This intense search for alternative treatment by patients has found an answer in modern medicine, and modern medicine has begun to approach the subject from different perspectives, such as complementary medicine, alternative medicine or holistic medicine [3].

However, herbal supplements in particular are widely preferred because they create a more natural perception in patients and are both cheaper and easily accessible [4]. In our country, there is a wide market for herbal medicines, ranging from local markets where medicinal and

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aromatic plants are sold as part of our culture, to companies that produce more industrial herbal medicines.

Herbal mixtures, also called natural herbal products, can be obtained without a prescription in our country and are frequently used by many people. Many patients preparing for the operation can also use these herbal mixtures and medicines, which are available without a prescription, in addition to the prescription medicines. These herbal medicines may be directly effective or they may be effective by pharmacodynamic and pharmacokinetic means. Thus, side effects can often be observed. It may also be possible that they may increase bleeding or show drug interaction with other drugs used in anesthesia [1]. It has been shown in various studies that they may also increase mortality and morbidity. For example, there are cases including epidural hematoma associated with excessive garlic consumption [5], bilateral subdural hematoma associated with ginkgo use [6], and acute renal failure associated with Chinese weight loss pills [7]. In the preoperative anesthesia examination, the use of herbal medication should also be questioned when the drugs used by the patients are interrogated, but it is frequently overlooked.

In anesthesia practice, patients are asked about their medications at the preoperative assessment, and possible drug-drug interactions and anticoagulant use are identified. However, they have not been questioned by physicians because they are not the focus of modern medicine and the use of these drugs has not been reported by patients because they are natural and innocent [8].

The objective of this research was to establish the prevalence of herbal medicine use and the most widely used herbal medicines in patients attending the Anesthesia Outpatient Clinic for preoperative analgesia.

2. Materials and Methods

Our study was designed as a prospective observational study. After obtaining the necessary ethical approval from the Clinical Research Ethics Committee of Kocaeli University (KOU KAEK 2015/8), patients who applied to the Anesthesia Outpatient Department of a tertiary hospital for preoperative examination were planned as the study population.

Inclusion criteria: Being 12 years or older, having applied to the outpatient clinic for preoperative anesthesia examination, and agreeing to participate in the study. Patients under 12 years of age, patients with an indication for emergency surgery, and patients with pain were excluded from the study.

When the use of herbal medication was questioned in the anesthesia outpatient clinic, patients who expressed the use of medication were asked to fill out a questionnaire about their use of herbal medication after informed consent was obtained.

In addition to demographic data such as age, gender, and educational status, the herbal medicine they were using, how long they had been using this medicine, where they learnt the medicine, for what purpose they were using the medicine, chronic disease status, and abnormal laboratory results were recorded.

2.1. Statistics

The analyses were conducted using the SPSS 25.0 program. In the descriptive statistics of the data, values such as the mean, standard deviation, median, minimum, maximum, frequency, and ratios will be used. The Kolmogorov-Smirnov test will be utilized for evaluating the distribution of the variables. Quantitative data will be analyzed using the Mann-Whitney u test. The Wilcoxon test will be used to analyze the results of multiple measurements. Correlation analysis will make use of the Spearman correlation method. Statistical significance threshold was determined as $p < 0.05$.

3. Results

The study comprised 2712 patients who attended the anesthesia outpatient clinic at our hospital. Of these, 345 patients were ineligible due to being under 12 years of age. The final evaluation included 96 patients aged between 12 and 18 years and 2271 patients who were over 18 years of age.

Out of the 2367 patients who were queried about their usage of herbal medicines, 32 reported using oral supplements. However, 4 patients were excluded due to non-herbal use. It was determined that 28 patients (1.18%) were found to be utilizing herbal medicines. (Fig. 1).

The age range of patients using herbal medicines was 18-85 years (52.18 ± 13.87). The demographic details of the patients are shown in Table 1. When we looked at the data related to the drugs used by the patients, we found that the shortest duration of drug use was 7 days and the longest duration of use was 15 years. It was found that 84.6% of the patients used the medication regularly and 50% of them used more than one herbal medicine/mixture (Table 2).

Table 1. Demographic data of patients using herbal medicines.

		Number (%) or Mean \pm SD
Age (years)		52.18 \pm 13.87
Gender	Male	13 (46.4%)
	Female	15 (53.6%)
	Total	28 (100.0%)
State of Education	Illiterate	1 (3.6%)
	Primary School Graduate	18 (64.3%)
	High-School Graduate	2 (7.1%)
	Associate Degree	2 (7.1%)
	Bachelor's Degree	4 (14.3%)
	Master's Degree	1 (3.6%)
	Total	28 (100.0%)

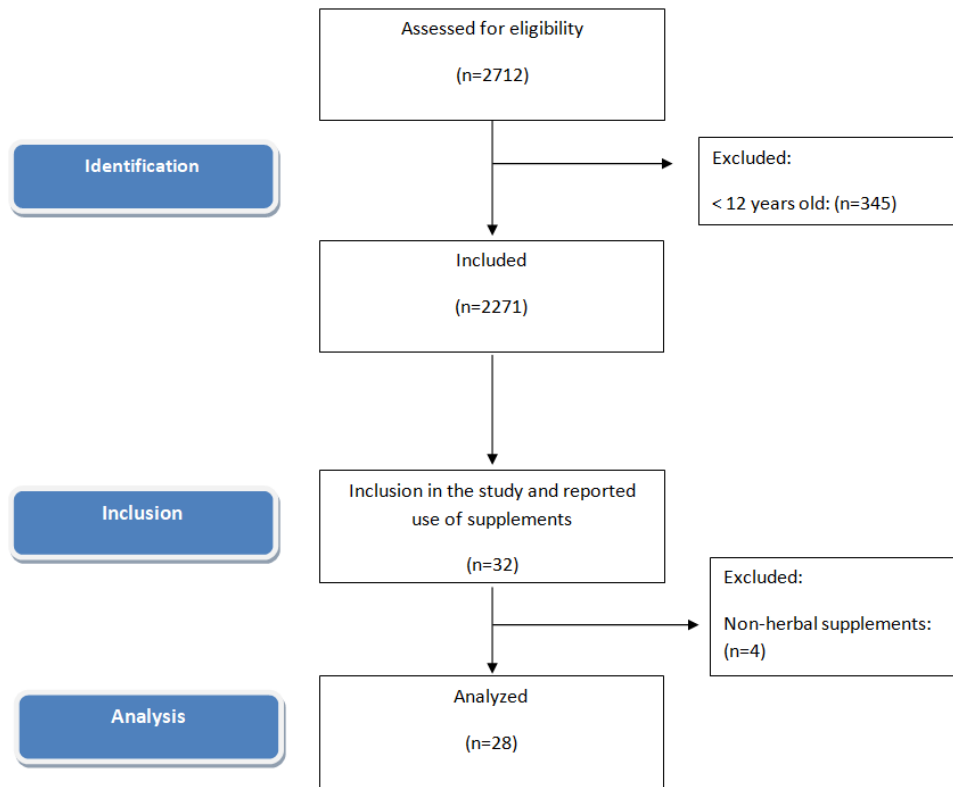


Fig. 1. Flow diagram of the study.

Table 2. Herbal medicines used and habits of use.

		N (%)
Regular use of medication	No	5 (17.9%)
	Yes	23(82.1%)
Multiple/mix use of drugs	No	14(50.0%)
	Yes	14(50.0%)
Total		28(100.0%)

When we asked our patients whom they first heard about the herbal medicine they were using, we found that the most common source was advice from their own social circle, such as relatives and friends. The second most common source was television, followed by their own knowledge, and advice from doctors and pharmacists (Fig. 2).

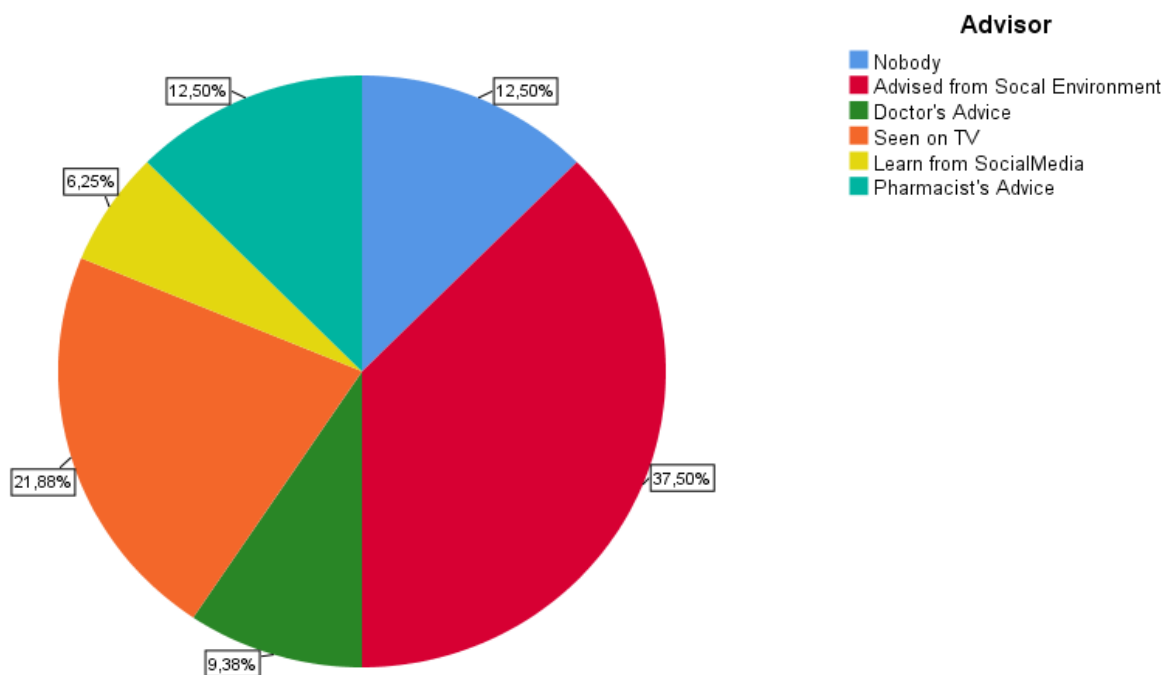


Fig. 2. Advisor of the herbal medicine.

When the co-morbidities of the patients were questioned, we found that 34% of the patients did not have any chronic disease and 28% had more than one chronic disease (Table 3). The number of patients with abnormal laboratory findings was n=9 (28%). Abnormal values in laboratory findings were compatible with the existing chronic diseases of the patients.

A detailed analysis of the herbs used by patients who declared that they use herbal medicines and the reasons for their use is given in Table 4. No side effects were observed in any of our patients neither in the intraoperative period nor in the postoperative period.

There was no statistically significant correlation among using multiple herbal remedies and having a chronic illness (p >0,005) (Table 5).

Table 3. Disease status of the patients.

Disease Status	N (%)
No disease	9 (32.1%)
One chronic disease	11 (39.3%)
More than one chronic disease	8 (28.6%)
Total	28 (100.0%)

Table 4. Case summaries of the study.

	n	Purpose of Use
Single Herbal Medicine	Black cumin	4 Anticancer, glucose regulation, anti-inflammatory
	Green tea	4 Indigestion, to lose weight, to live healthy, antioxidant
	Rhamnus catartica	1 Constipation
	Momordi cacarantia	1 Indigestion
	Ginseng	1 Vasodilator
	Gilaburu	1 Kidney stone
	Olive leaves	1 To regulate blood glucose level
	Parsley	1 Anti-edema
	Pistacia lentiscus	1 To treat low back pain
	Saw palmetto	1 To prevent prostate enlargement
Mixture of Herbs	Herbal slimming tea	3 To lose weight
	Black cumin, Cantaron, Carob molasses, St. John's wort	1 To treat of illnesses and to reduce stress
	Mixture of ginger, turmeric, cinnamon, sage	1 Asthma, goiter
	Reishi mushroom, olive leaf	1 Cleanse the bladder
	Horsetail herbal tea	
	Moxibustion	1 Supplement to main treatment
	Black grape extract with seeds and skins	
	Carob molasses	
	Flax seed	1 Expectorant. To relieve lung
	Green tea, fennel, ginger, turmeric, cinnamon, rosehip, Lemon mixture	1 To live healthy
Mesir Paste	1 To live healthy and improve the immunisation	
Total	28	

Table 5. Relationship between health status and single/multiple herbal medicine preference.

	Single Herbal Drug	Mixture of Herbs	p
	n (%)	n (%)	
Healthy	5 (17.8%)	6 (21.4%)	0.699
Having chronic disease	9 (32.1%)	8 (28.5%)	

4. Discussion

In this prospective study, the frequency of herbal medicine use in patients who underwent anesthesia examination before surgery was found to be 1.18%. It was reported that 82% of the patients used herbal medicine regularly, but only 21.88% of them followed the advice of a healthcare professional (doctor or pharmacist). It was found that 67.9% of patients using herbal medicine had at least one chronic disease, and 50% of them were

using multiple herbal products. There was no statistically significant correlation between the occurrence of multiple chronic diseases and the use of multiple drugs.

If we consider the studies conducted globally and domestically, it is evident that the cultural variability impacts the prevalence of herbal medicine usage in society. Notably, in Asian countries like China and India, there is a widespread use of herbal medicines with a reported high usage rate of 80% during pre-anaesthetic examination [9]. In western societies, the rate is slightly lower and in a study conducted in California, 39.2% of patients reported using adjuvant products and 62% of these products were herbal [10]. Another study reported that 4.8% of patients attending the anaesthesia outpatient clinic used one or more herbal medicines [11]. In the study by Tsen et al, this rate was reported to be 22% [12]. If we look at the studies conducted in our country, it was 14.5% in the study by Yilmaz et al [13] and 35.8% in the study by Uysal et al [14]. In the study conducted, it was discovered that the prevalence of herbal medicine use was 1.18%. Furthermore, in our study, no herbal drug use was found in the group of patients aged 12-18 years, whereas in a study by İyilikçi et al [15], 32% of the pediatric age group reported current or past herbal drug use. In our study, the rate was quite low compared to the literature. We believe that this may be due to the fact that some herbal teas consumed in our daily lives are not expressed as herbal medicines by patients, and the fear of withholding information in the pre-anaesthesia assessment. Previous studies have shown that a significant proportion of patients did not disclose their use of herbal medicines to the anaesthetist and surgeon during the pre-anaesthetic examination [2,10]

In our study, 53.2% of patients who used herbal medicines were female, and the mean age was 52.18 ± 13.87 years. Concurrently, a literature review discovered that women and those aged 40-60 years had higher herbal medicine usage [8,10,11].

Echinacea, ephedra, garlic, ginkgo, ginseng, kava, valerian, St. John's wort are reported as the most commonly used plants in reports from the USA [8], and in reports from India [9], we see that more local products such as blueberry and cohosh species are used, as well as herbal species reported from the USA. Studies in our country have also reported the use of herbs such as green tea, cinnamon, ginger, garlic, thyme, sage, lime, mint, chamomile and senna [13–16]. In our study, black cumin seed, green tea, ginger, turmeric, cinnamon and olive leaf were the most commonly used herbal products.

It has been reported that the main indications for the use of these medicines are diseases such as diabetes mellitus, cancer and arthritis [9]. When we analysed the indications for the use of herbal medicines in our study, we found that patients used these medicines to support the treatment of their chronic diseases, to treat an acute illness, to lose weight or to stay healthy.

Patients use herbal medicines because they think they are harmless or because they underestimate the potential for side effects. However, there are not enough studies on allergic effects, liver and kidney side effects. When the side effects of the most preferred herbal products are

studied, they are found to have serious side effects such as bleeding coagulation disorders, toxic hepatitis, spontaneous intracranial haemorrhage, arrhythmia, nausea, vomiting, immunosuppressive effect, hypo/hypertension, tachycardia, myocardial infarction, stroke, seizure [17–21].

Based on their side effects, publications report that herbal medicines have sedative, diuretic, antiaggregant, vasoconstrictor/vasodilator effects. They are also known to affect the pharmacodynamics and pharmacokinetics of drugs by inducing or inhibiting liver enzyme systems. [16,22–24]

In the study, it was found that black cumin seed and green tea were the herbal products most frequently used by the patients. When we looked at the side effects of these two products, we found that green tea may cause insomnia, arrhythmias, and antagonise the effect of warfarin because it contains high amounts of vitamin K [16]. It has been reported that black cumin increases liver enzymes, shortens aPTT, decreases hemoglobin, hematocrit and platelet count in case of advanced exposure, therefore its use is not recommended in patients using blood thinners, pregnant women and patients who will undergo surgery [25]. Ginger, which is widely used in Turkey, causes hyperglycemia, prolongs bleeding time, thyme; has tachycardic and diuretic effects, garlic; prolongs bleeding time, may cause hypotension, St. John's wort may decrease the activity of other drugs, ginseng; disrupts platelet aggregation, is a vitamin K antagonist [9,16].

For all of these reasons, the pre-anaesthetic assessment should ask whether the patient is using herbal medicines in addition to the prescription medicines they routinely take. In the American Society of Anesthesiology (ASA) article on the use of herbal medicines, the potential effects of using herbal medicines before surgery are listed as follows: Prolonging the effect of anaesthesia Increased risk of bleeding. Increase blood pressure, interact with other medications, cause heart problems. For this reason, he recommends stopping herbal medicines 2-3 weeks before surgery [26].

In emergency scenarios, if the patient can provide information about the medication they are taking, it would be helpful to consider potential side effects. If the patient is not aware of the medication they are taking, it is necessary to assess preoperative liver and kidney functions, prothrombin time (PT), activated partial thromboplastin time (aPTT), international normalized ratio (INR), and bleeding time. Additionally, a detailed blood count should be conducted, and hemodynamic instability and drug interactions during the preoperative period should be examined. Vigilance is crucial in this regard.

5. Conclusions

As a result, herbal medicines are not as innocent as they are thought to be, and are used far more than is reported in the literature because of their easy accessibility, their use without a prescription and the fact that they are part of the culture of many countries. The number of herbal products used as herbal medicines is in the thou-

sands. The lack of standardization in the dosage, preparation and storage of these products, the paucity of randomised controlled trials on the effects of herbs, and the high number of reports of adverse effects have complicated the issue. For all these reasons, we believe that questioning the use of herbal supplements in the pre-anesthetic assessment, educating patients on the subject, and discontinuing the use of these drugs 2-3 weeks before surgery is one of the issues that should be included in daily anaesthesia practice.

Acknowledgements

None declared.

Funding

The author received no financial support for the research, authorship, and/or publication of this manuscript.

Conflict of Interest

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this manuscript.

Data Availability

The datasets created and/or analyzed during the current study are not publicly available, but are available from the corresponding author upon reasonable request.

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