

Pulmonary and Allergy

Herbals and Asthma: Usage Patterns Among a Border Population

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BACKGROUND: The use of herbal products (HP) is rising in the US. Higher rates of HP use have been documented in the US/Mexico border population, as well as increasing concerns about herbal-related adverse events.

OBJECTIVE: To evaluate the prevalence of HP use in adult asthmatic patients requiring hospitalization and the frequency of HP documentation in medical records.

METHODS: We conducted a retrospective chart review of admissions for asthma to determine the frequency of HP documentation. Additionally, during a 12-month period, a bilingual interviewer conducted prospective, semistructured interviews with patients with asthma exacerbations to record data on HPs used specifically for the treatment of asthma.

RESULTS: A total of 67 cases were chart-reviewed retrospectively; 60 patients were interviewed prospectively. We found no documentation of HP use by chart review, while prospective interviews showed that 42% of patients reported using HPs for the treatment of asthma. The most common HPs used were oregano 28%, chamomile 20%, garlic 16%, eucalyptus 12%, and lime 12%. Ten patients reported taking an HP that could potentially exacerbate their asthma and 18 patients reported using an HP that could interact with other medications or cause other types of adverse events.

CONCLUSIONS: An obvious lack of documentation for HP use was observed in the medical records reviewed. Because a number of HPs that are commonly used by residents along the border can interact with antiasthmatic agents and/or result in compromised asthma control, questions about HP use should be included in routine history taking.

KEY WORDS: asthma, herbs, US/Mexico border.

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It is estimated that >5% of the US population suffers from asthma, a disease most commonly seen in the pediatric population.¹ Treatment guidelines for the management of asthma have been published by the National Heart, Lung, and Blood Institute and are widely used.² Unfortunately, issues related to the use of herbal products (HPs) and other types of complementary and alternative medicine (CAM) in asthmatic patients are addressed only briefly in these guidelines.

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Incidence reports of HP usage in the general US population vary, ranging from 12.1% to as high as 59% in certain areas along the US/Mexico border.^{3,4} A number of recent studies have attempted to increase awareness of the possible risks associated with the use of alternative medicine including HPs. In a previous study conducted in the El Paso-Ciudad Juarez area, we found that a wide range of mainly regional HPs, many of which can potentially lead to drug interactions and other adverse events, are commonly used by the border population.⁴ Our findings suggest that HP usage rates may be higher among Mexican-Americans compared with national trends in the US population.⁵

Several types of CAM have been used in the treatment of asthma. These modalities include acupuncture, homeopathy, yoga, breathing exercises, relaxation therapies, nutritional therapies, and HPs. A survey conducted in the UK reported that 33% of a sample of 4741 asthmatic patients >16 years

of age had been treated with CAM and most of the patients perceived these therapies to be highly effective.⁶ In that study, HPs were third on the list of most commonly used forms of alternative medicine. Similarly, in another study conducted in Australia, 29% of 174 pediatric patients with asthma used HPs in addition to conventional therapies.⁷

An extensive review of the English and German literature concluded that most alternative therapies are no better than placebo in the treatment of asthma.⁸ In that review, breathing techniques and muscle relaxation were reported to have the most potential for relieving symptoms of asthma. A systematic review of randomized clinical trials using HPs for the treatment of asthma was conducted.⁹ A total of 17 randomized clinical trials were included, most of which used traditional Chinese herbal medicine or traditional Indian medicine. While some of the trials showed benefit, the authors indicated that most of the studies were limited by poor methodology. In another extensive review of alternative strategies in the treatment of asthma, the authors expressed skepticism about the value of CAM in the treatment of asthma.¹⁰ Most of the therapies included in that review were medically based, but were only considered alternative in that the therapies were not considered conventional asthma treatment. Studies involving CAM therapies were limited, and studies of HPs were not included in the review.

Very few US studies have evaluated use of CAM in the asthmatic population. Random sample telephone interviews in northern California showed that 24% of the population used HPs.¹¹ Sixteen percent of the sample was Hispanic, and interviews were conducted in Spanish if necessary. In a separate study, a sample of 160 individuals in an inner-city New York high school was evaluated.¹² Thirty-nine percent of the population reportedly used herbal teas for the treatment of asthma. Hispanics comprised 68% of the sample. In both of these studies, the diagnosis of asthma was self reported, and neither specified which HPs were used.

Our study addresses the need for research related to the use of HPs among patients with asthma. Our objectives were to establish the incidence of HP use in the treatment of asthma among patients who reside on the US/Mexico border and evaluate possible problems associated with the use of these products. Furthermore, we sought to identify the frequency with which healthcare providers document HP use in medical records.

Methods

Participants were asthmatic patients >18 years of age who were hospitalized at Thomason Hospital in El Paso, Texas, with a primary diagnosis of asthma (ICD -9 493.00– 493.92¹³). The hospital is a 346-bed university-affiliated acute care facility and is the sole county hospital in the region. The institutional review boards of Texas Tech University Health Sciences Center at El Paso and the University of Texas at El Paso approved the study protocol. Informed consent was obtained for patient interviews according to institutional requirements.

STUDY DESIGN

The study was conducted in 2 phases, with the first phase involving a 2-year (1999–2001) retrospective review of patient medical records. A

standardized data collection form was used to record demographic information, locations and providers of outpatient medical care, and documentation of HP use from patient records. Data were obtained from in-patient medical records that identified an ICD -9 asthma-related primary diagnosis.

The second phase (2000–2001) was conducted in a prospective manner. A bilingual research assistant who had received training in patient interviewing techniques conducted semistructured interviews with hospitalized patients. Patients were identified from a daily review of emergency department admission records. The interviewer collected information similar to that obtained from retrospective chart reviews. Patients were presented with a list of HPs that have been used to treat asthma and asked whether they had used these products within the previous 12 months. Additional entries were made if patients used products that did not appear on the list. Instances of HP use were recorded only if the product had been used in the previous year. Because some individuals were admitted several times during the study period, only one admission per patient was included.

STATISTICAL METHODS

Categorical data were analyzed by enumeration and expressed as percentages. Continuous variables are presented as means ± SD for each of the groups. All analyses were done using SPSS statistical software (SPSS, version 11.0 for Windows).

Results

A total of 67 patients were included in the retrospective chart review; 60 patients participated in the interview process. Seventy-five percent of the retrospective group and 73% of the prospective group were women, with a mean age of 48 SD ± 16 and 17, respectively, in both groups. Fifty-seven percent of the retrospective group and 82% of the prospective group were Hispanic, and >90% of participants in both groups were US born. Complete demographic data are presented in Tables 1 and 2.

We found no documentation of HP use in our retrospective review of patient records, while 25 of the 60 patients interviewed (42%) reported having used HPs for the treatment of asthma during the previous 12 months. The most common HPs used were oregano (28%), chamomile (20%), and garlic (16%). Table 3 provides a complete listing of all

Table 1. Patient Demographics

Characteristic	Retrospective ^a (n = 67)		Prospective ^b (n = 60)	
	n	%	n	%
Gender				
female	50	75	44	73
male	17	25	16	27
Ethnicity				
Hispanic	38	57	49	82
white	13	19	8	13
other	16	24	3	5
US born	60	90	58	97
Non-US born	7	10	2	3
Herbal product use	N/D	N/D	25	42

N/D = not documented.
^a2 years of data collected.
^b1 year of data collected.

HPs used by our population. Products that have been associated with adverse reactions and drug and/or disease state interactions are identified as such.

We recorded 28 instances of HP use with the potential to cause adverse reactions, 7 instances of potential drug interactions, and 4 instances of potential disease state interactions. Twenty-two of 25 (88%) patients taking HPs for the treatment of asthma were exposed to at least one potential herb-related problem. Of these, 10 patients took an herb that can exacerbate asthma (chamomile, garlic, chile) and 18 patients used an herb that can cause other adverse drug events (oregano, garlic, lime, eucalyptus, coffee, teas, cinnamon, tomillo). At the time of the study, all participants were using conventional asthma medications and, in all cases, the asthma diagnosis was made by a physician.

Discussion

One important finding in our study was the lack of documentation of HP use in patient medical records. Although the retrospective review covered 2 years, we were unable to find a single documented record of HP usage. In contrast, results from patient interviews showed that 42% of the patients had used one or more HPs to treat their asthma. This discrepancy may be due to the fact that most healthcare providers do not address the issue of CAM use and may not ask patients about their use of HPs. Previous research has shown that disclosure rates for HP use, as well as other types of CAM use, are quite low in various populations.^{3,4} Because these therapies are not regulated and evidence of efficacy and safety is limited, healthcare providers may not be aware of the implications associated with their use. Furthermore, some evidence exists that patients may withhold information about use of alternative therapies, in part because patients anticipate that the physician may have a negative view of such therapies.⁴ It is clear that educational efforts targeting healthcare providers are needed. We have developed one such program with the goal of increasing awareness and knowledge of HPs in the border community.¹⁴ This includes a Web site that provides HP information to healthcare providers and the general public with special emphasis on the safe use of HP common to our region, as well as relevant research findings.

Table 2. Age on Admission, Age Diagnosed, and Length of Stay

Study Phase	Age		Length of Stay (d)
	On Admission	At 1st Diagnosis	
Retrospective ^a			
mean ± SD	48 ± 16	36 ± 20	4 ± 1.7
range	18–79	1–77	1–11
Prospective ^b			
mean ± SD	48 ± 17	35 ± 19	3 ± 2.1
range	18–83	1–76	1–14

^a2 years of data collected.
^b1 year of data collected.

Most of the HPs used by our patients had the potential to cause a number of adverse events. Whether an instance of HP use results in an adverse event depends on a number of factors including, but not limited to, the conditions under which the herb was grown, the source of the product (commercial vs raw), the frequency and method of use, and the presence of coexisting medical conditions. For example, if oregano is used in a certain form for food preparation, the product is considered safe, although an adverse reaction was reported in a patient who ingested oregano.¹⁵

The use of some herbs as essential oils or in a concentrated form could also be unsafe. In one review, several cases of severe toxicity from eucalyptus oil were reported, including 2 deaths.¹⁶ Our study was limited in that we did not address the method of administration of the herb, only that it was used for a medical purpose.

Certain products reportedly used by our sample may actually trigger an asthma exacerbation. For example, chamomile, the second most commonly used herb in our study, has been known to cause allergic reactions including anaphylaxis.^{17,18} Appendix I lists uses and potential problems associated with the HPs taken by our patients.^{15,16,18-51}

The issue of HP use is further complicated by various other factors. According to the 1994 Federal Dietary Supplement and Health Education Act, HPs are classified as dietary supplements and, as such, the labeling may suggest that these products can be used to treat a medical condition.⁵² While the act states that the manufacturer is responsible for the claims made on the label, no standards are provided for justification of claims. The act also states that it is the responsibility of the Food and Drug Administration to prove that the products are unsafe. Additionally, the act does not require that the contents that appear on the label are present in the given product. Variations in concentrations may exist, and products may contain other substances that are not listed on the label. The need for new regulation has been clearly stated in 2 recent reviews, and studies have shown the presence of a number of contaminants and/or adulterants in certain products that are currently on

Table 3. Herbal Products Reported

Product	Pts.	
	n	%
Oregano ^a	7	28
Chamomile ^a	5	20
Garlic ^{a,b,c}	4	16
Lime ^a	3	12
Eucalyptus ^a	3	12
Gordolobo	2	8
Coffee ^{a,b}	2	8
Teas ^{a,b}	1	4
Cinnamon ^a	1	4
Tomillo ^a	1	4
Chile ^a	1	4

^aImplicated as causing adverse reactions.
^bImplicated as causing drug interactions.
^cMay interact with a disease state.

the market.⁵³⁻⁵⁶ Lastly, although many of these products have been used for centuries, research related to the study of HPs is limited, and a great deal remains to be learned about the safety and efficacy of these products.

Summary

An obvious lack of documentation exists regarding HP use in medical records, likely due to the fact that many healthcare providers may not be aware of the effects of

HPs and may not ask patients about their use. Some products that are commonly used in the border region may interact with antiasthmatic agents and/or result in compromised asthma control. Information related to the use of HPs is not only relevant but important and should be routinely obtained when obtaining patient histories. Additional research is needed to further understand the properties of these products, document adverse reactions, and study variations in product sources, routes of administration, and the use of essential oils.

Appendix I. Most Commonly Used Herbal Products		
Common Names (English, Spanish, botanical)	Therapeutic Use	Adverse Effects/Interactions
Cayenne, chile <i>Capsicum</i> spp.	used as a topical pain reliever, usually applied as a cream to painful joints, especially in treatment of osteoarthritis, fibromyalgia, and postherpetic neuralgia preparations have been used to treat stomach ulcers caused by <i>Helicobacter pylori</i> and indigestion, but results are not conclusive	active ingredient is capsaicin, which is primarily responsible for proposed healing properties ¹⁹⁻²⁴ acute asthma episodes may be aggravated by single use ²⁵ ; bronchoconstriction may occur if powder is inhaled ²⁶ potential human carcinogen ²⁷ pts. treated with ACE inhibitors may have predisposition to coughing when creams containing capsaicin are applied to their skin ²⁸
Chamomile, manzanilla <i>Matricaria recutita</i>	boiled flower heads are used to inhale the vapors for the treatment of respiratory ailments reputed to have antiinflammatory properties	anaphylaxis from ingesting tea, although rare, can happen in susceptible asthmatic individuals, especially if cross sensitization has occurred with other members of the Daisy family (Asteraceae) ^{18,29-32}
Cinnamon, canela <i>Cinnamomum</i> spp.	tea has expectorant properties	essential oil (from the bark) can be neurotoxic if ingested ³³
Coffee, café <i>Coffea arabica</i>	used to treat asthma	contains methylxanthenes (CNS stimulants) should not be taken with "energy-boosting" beverages or weight loss supplements containing herbs such as Guaraná, Máte, or Ephedra (Ma Huang), as the combination of these herbs may cause overstimulation of the CNS drinking during pregnancy is associated with increased risk of stillbirths ³⁴ may antagonize effectiveness of triazolam and zopiclone if taken concurrently ³⁵ dietary caffeine can increase the effects of theophylline if taken concurrently ³⁶
Eucalyptus, eucalipto <i>Eucalyptus globulus</i>	tea used for respiratory ailments essential oil employed in inhalations and applied externally to pectoral area to treat upper respiratory infections	essential oil can be very toxic if ingested, causing respiratory distress, as well as neurologic symptoms applying the oil to the nostrils of babies or asthmatic patients can result in fatal bronchospasm essential oil can be toxic if applied to the skin ^{16,37,38}
Everlasting, gordolobo <i>Gnaphalium</i> spp.	flower heads employed as a tea against asthma and other upper respiratory tract problems	some plants belonging to the genus may contain pyrrolizidine alkaloids, which can be both hepatotoxic and carcinogenic safety of long-term use has not been evaluated contact dermatitis has also been reported for some species ³⁹⁻⁴¹
Garlic, ajo <i>Allium sativum</i>	has been used internally to combat various infections and externally as a skin antiseptic	may cause occupational asthma, as well as interfering with platelet aggregation, potentially retarding clotting ⁴²⁻⁴⁷
Key lime, limón <i>Citrus limonum</i>	lime juice and peel are used to fight infections and inflammation due to respiratory ailments	peel may be irritating, causing skin sensitization and phototoxicity in susceptible individuals ^{15,48}
Oregano <i>Origanum</i> spp.	tea has expectorant properties and is employed against respiratory ailments	inhalant allergens may be present concentrated teas may stimulate the uterus and cause abortion essential oil has expectorant properties applied topically; has strong irritating action upon the mucous membranes and is toxic if ingested ^{49,50}
Teas, tes, (type or plant species not specified)	specific types not mentioned	similar to caffeine
Thyme, tomillo <i>Thymus vulgaris</i>	tea has expectorant and antiseptic effects	essential oil can be neurotoxic if ingested ⁵¹

ACE = angiotensin-converting enzyme; CNS = central nervous system.

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EXTRACTO

INFORMACIÓN DE FONDO: El uso de productos herbarios (PH) en los Estados Unidos está aumentando. Se han documentado niveles de uso más altos entre la población fronteriza de los Estados Unidos y México, aumentando también preocupaciones sobre eventos adversos relacionados con el uso de estos productos.

OBJETIVO: Evaluar la prevalencia del uso de PH en pacientes adultos quienes padecen de asma y requieren hospitalización. Evaluar la frecuencia con la que se documenta el uso de PH en el expediente médico.

MÉTODOS: Para determinar la frecuencia de documentación del uso de PHs, hicimos un repaso retrospectivo de los expedientes de pacientes que fueron admitidos al hospital por causas de asma. Además, para obtener información sobre los PHs que se usaron específicamente para tratar el asma, un entrevistador bilingüe coleccionó data prospectiva durante un período de 12 meses, por medio de entrevistas semi-estructuradas con pacientes que tenían exacerbaciones de asma.

RESULTADOS: En total, 67 casos fueron repasados retrospectivamente y 60 pacientes fueron entrevistados. No encontramos ninguna documentación del uso de PHs en los expedientes. En cambio, 42% de los pacientes que entrevistamos indicaron que habían usado PHs para el tratamiento de asma. Los PHs que se usaron con más frecuencia fueron orégano 28%, manzanilla 20%, ajo 16%, eucalipto 12%, y limón 12%. En total, 10 pacientes indicaron que habían tomado un PH con potencial de exacerbar el asma. Dieciocho pacientes indicaron que habían usado un PH que pudiese interactuar con otros medicamentos y/o causar otros tipos de eventos adversos.

CONCLUSIONES: Observamos una falta obvia de documentación con respecto al uso de PHs en los expedientes médicos que repasamos. Siendo que varios PHs que se usan con frecuencia en la frontera pueden interactuar con agentes antiasmáticos o resultar en una reducción del

control del asma, preguntas sobre el uso de PHs se deben incluir cuando se toma la historia rutinaria del paciente.

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RÉSUMÉ

CONTEXTE: L'utilisation de produits naturels (PN) est en progression aux États-Unis. Des taux d'utilisation plus élevés sont été rapportés chez la population habitant à proximité de la frontière américano-mexicaine, ce qui pourrait augmenter le risque d'effets indésirables associés aux PN dans cette région.

OBJECTIFS: Étudier la prévalence de l'utilisation de PN chez les patients adultes asthmatiques nécessitant une hospitalisation et évaluer la documentation de l'utilisation de PN dans les dossiers médicaux.

MÉTHODES: Une revue rétrospective des dossiers médicaux des patients admis pour cause d'asthme a été effectuée afin de déterminer la fréquence de documentation. De plus, un interviewer bilingue a conduit durant une période de 12 mois des entrevues avec des patients admis pour l'exacerbation de leur asthme afin de documenter leur usage de PN.

RÉSULTATS: Soixante-sept dossiers ont été révisés et 60 entrevues réalisées. Il n'y avait aucune référence à l'utilisation de PN dans les dossiers médicaux alors que 42% des patients ont admis utiliser des PN pour le traitement de l'asthme. Les produits mentionnés le plus souvent comprenaient: l'origan (28%), la camomille (20%), l'ail (16%), l'eucalyptus (12%), et la lime (12%). Dix patients ont rapporté utiliser un produit qui pourrait potentiellement exacerber leur condition. Dix-huit patients ont déclaré employer un PN qui pourrait interagir avec des médicaments ou causer des effets indésirables.

CONCLUSIONS: Un manque flagrant de documentation sur l'utilisation de PN dans les dossiers médicaux a été observé. Puisque un nombre important de PN utilisés couramment peut interagir avec les agents utilisés dans le traitement de l'asthme et ainsi en compromettre le contrôle, l'histoire médicamenteuse devrait inclure des questions sur la consommation de PN.

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