Use of Medicinal Plants with Teratogenic and Abortive Effects by Pregnant Women in a City in Northeastern Brazil

Uso de Plantas Medicinais com Efeitos Teratogênicos e Abortivos por Gestantes em uma Cidade no Nordeste do Brasil

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Abstract

Purpose The purpose of this study is to verify the use of medicinal plants by pregnant women treated at four Basic Health Units and at a public maternity facility in Brazil's northeast.

Methods This is a cross-sectional, quantitative study, performed between February and April 2014. The subjects were 178 pregnant women, aged 18 to 42 years. To collect data, a structured questionnaire with dichotomous and multiple choice questions was used. To verify the correlation between the variables, Pearson's chi-square test was used.

Results The study showed that 30.9% of the pregnant women used medicinal plants, and boldo was the most cited (35.4%). All the plants utilized, except lemongrass, have toxic effects in pregnancy, according to Resolution SES/RJ N° 1757. There was no statistically significant correlation between social class and use of medicinal plants.

Conclusion The health of the study participants and their unborn children is at risk due to the inappropriate use of medicinal plants.

Keywords
► phytotherapy
► pregnancy
► medicinal plants
► peumus boldus
► foeniculum vulgare
► melissa officinalis

Resumo

Objetivo Verificar o perfil de uso de plantas medicinais por gestantes atendidas em quatro Unidades Básicas de Saúde da Família e em uma maternidade pública da cidade de Campina Grande – PB, na região Nordeste do Brasil.

Métodos Estudo transversal, quantitativo, desenvolvido no período de Fevereiro a Abril de 2014. Foi incluída uma amostra com 178 gestantes com idade entre 18 e 42 anos. O instrumento de coleta foi um questionário estruturado com perguntas

Palavras-chave
► fitorerapia
► gravidez
► plantas medicinais
► peumus boldus
► foeniculum vulgare
► melissa officinalis

dicotômicas e de múltipla escolha. Para verificar a associação entre as variáveis estudadas, utilizou-se o teste Qui-quadrado de Pearson.

Resultados   Foi constatado que 30,9% das gestantes utilizavam plantas medicinais, sendo o boldo a mais citada (35,4%). Entre as plantas utilizadas com alta frequência pelas gestantes, todas, com exceção apenas da Erva-Cidreira (Melissa officinalis), apresentavam possíveis efeitos tóxicos para a gestação, segundo a Resolução SES/RJ N° 1757. Ao comparar a classe social e o uso de plantas medicinais, não observou-se relação significante.

Conclusões   A saúde das grávidas que fazem uso de plantas consideradas medicinais, assim como a de seus filhos, sofrem riscos devido ao uso inadequado destas plantas.

Introduction

Phytotherapy is defined as therapy based on the use of medicinal plants. The use of these plants for treatment, cure, and prevention of diseases has mostly originated from popular knowledge derived from ancient cultures.[1] This traditional knowledge of medicinal plants has been used by the pharmaceutical industry, as there is enormous potential for the discovery of new drugs.[2]

According to the declaration of Alma-Ata in 1978, the World Health Organization (WHO) recognizes that 80% of the population in developing countries - including Brazil - use traditional practices in their basic healthcare, and 85% use medicinal plants, or preparations from them. Accordingly, it is the intention of the WHO to encourage the use of phytotherapy in basic healthcare.[3]

As the use of medicinal plants is based mostly on cultural heritage and not in research on their effects, it is necessary to study how they are used by the populace. Knowledge acquired from cultural heritage can lead to the inappropriate use of plants, with adverse reactions in certain situations.[4]

Pregnant women may turn to this therapeutic option and require special attention. Because many allopathic medicines are teratogenic and are contraindicated during pregnancy, women may seek phytotherapy as alternative care.[5]

Medicinal plants have a globally important role during pregnancy, birth, and the postpartum period. The use of plants before and after delivery and during lactation has been documented in various cultures. However, the majority of research focuses on the knowledge of these plants held by male folk healers, shamans, or others, neglecting the knowledge possessed by women themselves.[6]

Nonetheless, studies indicate that some medicinal plants have toxic, teratogenic, and abortive potential, because some active principles are able to cross the placental barrier and reach the fetus, especially in the first trimester of pregnancy. Studies performed with plants commonly used by the populace, such as the babosa (*Aloe spp.* L.), peppermint (*Mentha piperita* L), fennel (*Foeniculum vulgare* Mill.), and carqueja (*Baccharistrimera* (Less.) DC.), among others, are contraindicated in pregnant women.[7]

The Secretary of Health of the State of Rio de Janeiro published Resolution SES/RJ No. 1757 on February 18, 2008, contraindicating various medicinal plants on the basis of scientific studies that revealed the hazards they represent for the baby, both during gestation and breastfeeding.

The objective of this study was to identify which medicinal plants are used by pregnant women attending a Central Unit and four Basic Family Health Units in the city of Campina Grande in the northeast of Brazil.

Methods

This cross-sectional study with a quantitative design was developed at the Elpídio de Almeida Health Institute (ISEA) located in the central district, and in four Basic Family Health Units (UBSF) of the Malvinas borough (Malvinas I, II, III, and IV), in Campina Grande - PB, from February to April 2014.

A total of 178 pregnant women over 18 years of age participated in the research, in any stage of pregnancy. They attended the ISEA and Basic Family Health Units of the Malvinas borough, and gave informed consent, based on the guidelines and regulatory standards for research involving human beings covered by the Resolution 196/96 of the National Health Council.

The research team used a structured questionnaire to gather data.[5] The first part consisted of questions regarding demographic and socioeconomic status; the second part included questions regarding general knowledge about medicinal plants; the third part questioned specific knowledge, such as indications for use of certain plants, and the method of preparation, among others. The plants cited by pregnant women were compared with those in Resolution SES/RJ N° 1757, which contraindicated the use of certain plants during pregnancy.

The researchers used SPSS (SPSS Inc., Chicago, USA) Version 17.0 to organize the database and for statistical analysis. To verify the association between the variables studied (use of plants as a dependent variable and social class as an independent variable), we used Pearson's non-parametric Chi-square test, with a significance level of $p < 0.05$ and a 95% confidence interval. The social classification of the population was based on the economic criteria of the Brazilian Association of Research Companies (Associação Brasileira de Empresas de Pesquisa - ABEP).

Table 1 Socioeconomic profile of pregnant women attending the Elpídio de Almeida Health Institute and the Basic Family Health Units of the neighborhood of Malvina in Campina Grande, PB, Brazil, from February to April 2014

Characteristics	n	%	Characteristics	n	%
Marital status			**Salary Range**		
Married	117	65.7	Up to 1 M.W.	91	51.1
Single	58	32.6	1 to 2 M.W.	64	36
Stable Relationship	2	1.1	2 to 3 M.W.	13	7.3
Divorced	1	0.6	More than 3 M.W.	10	5.6
Education			**Social Class**		
High School complete	79	44.4	C2	56	31.4
Elementary incomplete	45	25.3	C1	55	30.8
Elementary Complete	37	20.8	D	44	24.7
Higher education complete	9	5.1	B2	17	9.5
Illiterate	3	1.7	E	3	1.6
High School Incomplete	3	1.7	B1	3	1.6
Higher education Incomplete	2	1.1	–	–	–

Abbreviation: M.W., Minimum Wage.

The research project was approved by the Research Ethics Committee of the Hospital UniversitárioAlcidesCarneiro, under protocol number 05552412.0.1001.5182 in 2013.

Results

Of the 178 pregnant women interviewed, 48.8% were 26 to 35 years old. Their ages ranged from 18 to 42 years, with a mean age of 28. Among the participants, 65.7% were married and 44.4% had completed an elementary school education. The predominant social class was C2 (31.4%), with a family income of up to one minimum wage (51.1%). These data are shown in ►**Table 1**. A total 47.2% were in the third trimester, 34.8% in the second, and 18% in the first. Conventional houses were occupied by 84.8%, and 80.3% had access to basic sanitation.

During pregnancy, 30.9% reported the use of medicinal plants. The most used plants were boldo (*Peumusboldus* Molina, by 35.4%), Fennel (*Foeniculum vulgare*, by 24.2%), balm mint (*Melissa officinalis* L., by 22.5%), lemongrass (*Cymbopogoncitratus* (DC.) Stapf, by 6.4%), chamomile (*Matricariachamomilla* L., by 4.8%), carqueja (*B. trimera,* by 3.2%), and mint (*M. piperita*, by 3.2%). The data for each of these plants are summarized in ►**Table 2**.

There was no statistically significant correlation between social class and the use of medicinal plants ($p = 0.8$). Of the women in the first trimester of pregnancy, 21.9% used medicinal plants, as did 33.9% in the second trimester, and 32.1% in the third.

The participants reported that knowledge on the use of medicinal plants had been acquired from relatives (89.3%), friends (5.1%), books (2.2%), physicians (0.6%), and others (1.7%). Relatives were the most responsible for the use of plants (81.8%), while health professionals were responsible for only 2.6% of recommendations.

The plants were acquired mostly by purchase (67.5%) or were home-grown (19.5%), and were used typically once a day (36.6%), boiled (54.6%), and used daily (55.5%). Among interviewees who used medicinal plants to treat discomfort related to pregnancy (12.9%), the most common symptoms were nausea (47%), pain in general (29.4%), and heartburn (11.8%).

A total 73.6% said they believed that the use of certain medicinal plants can cause adverse effect in pregnancy. Among those who said they perceived an undesirable effect (3.6%), the most frequently mentioned were bleeding (1.8%), allergy (0.9%), and headache (0.9%).

Discussion

Pregnancy is considered special, both scientifically and culturally. Thus, certain practices based in both biomedical and popular knowledge are seen in pregnant women.[8] The use of medicinal plants is one example.

The concern about harm to the fetus leads some pregnant women to avoid allopathic medicines and choose medicinal plants, which are perceived as natural and, therefore, unable to cause harm. This raises concerns about the possible effects that their indiscriminate use may cause.[9]

In the present study, 30.9% of the pregnant women used medicinal plants. In a study by Macena et al,[10] 55.5% of pregnant women reported using medicinal plants.

We found no significant relationship ($p = 0.8$) between the use of plants and social class. Therefore, the indiscriminate use of phytotherapy extends across all segments of the population, confirming studies by Veiga Júnior,[11] which highlight indiscriminate self-medication with medicinal plants by all social classes.

It is known that the first trimester of pregnancy is the period of embryonic differentiation. At this stage, there is

Table 2 List of plants most used by pregnant women in this study

Popular name	Scientific name	% of use	Indication	Adverse Effects
Boldo	*Peumus boldus*	35.4	Ability to protect the liver from toxins (hepatoprotective) due to the antioxidant activity of its active ingredient,[15,16] boldine, which is also an agent potentially useful in the treatment of breast cancer.[17]	Teratogenic effects and abortifacient.[18]
Fennel	*Foeniculum vulgare*	24.2	Carminative, expectorant, spasmolytic, and diuretic action.[19]	Hydroalcoholic extracts caused effects on embryo implantation. Teratogenic potential should be considered.[20] Abortifacient and galactogogue activity.[21]
Balm mint	*Melissa officinalis*	22.5	Reduces the duration and intensity of herpes outbreaks due to antiviral properties.[22] Sedative and anxiolytic effects.[23]	Abortifacient or teratogenic effects were not found in the literature consulted.
Lemon Grass	*Cymbopogon citratus*	6.4	Sedative, anti-inflammatory,[24] gastroprotective,[25] and anti-allergic action.[26]	Relaxing property for the uterine musculature.[7]
Chamomile	*Matricaria chamomilla*	4.8	Moderate antimicrobial and antioxidant property and powerful anti-inflammatory activity.[27]	Has emmenagogue properties.[28]
Carqueja	*Baccharis trimera*	3.2	Cytoprotective of the gastric mucosa, capable of inhibiting ulcers.[29] Has relevant hyperglycemic effect.[30] Hepatoprotective, anti-inflammatory, and cholagogue activity, related to the presence of flavonoids.[31,32]	Induction of abortion due its uterotonic properties.[7,33]
Mint	*Mentha piperita L.*	3.2	It has shown promising activity in the treatment of intestinal spasms.[34]	Emmenagogue and teratogenic[7]; cytotoxic.[35]

greater risk of congenital malformations due to exposure to certain substances. In the present study, 21.9% of pregnant women used medicinal plants in the first trimester, and their fetuses were, thus, more vulnerable to the risk of malformations. During the second and third trimesters, changes due to exposure to toxic substances may also occur, affecting growth and functional development.[12]

The majority of the pregnant women (84.8%) lived in conventional houses, which contributes to the use of home-grown medicinal plants.

The method by which women learned about the plants was similar to that reported in the study by Veiga Junior[11]: 90.1% of the interviewees obtained knowledge about such therapy from family members or friends, and only 3.2% from a medical recommendation. These data confirm that the origin of knowledge on medicinal plants is mostly of sociocultural origin, rather than from prior studies on the effects of such treatment.[3] During pregnancy, women become more susceptible to advice and guidance from family and friends

on home remedies considered beneficial, thereby facilitating self-medication.[13]

Self-medication is a practice in which a patient gets or produces and uses a product, be it a synthetic drug or a medicinal plant, without the guidance of a qualified professional. When used by pregnant women, such medication presents a risk to the health of both mother and fetus. One must emphasize the need for guidance by health professionals (in this study, they were responsible for only 2.6% of phytotherapy recommendations), grounded in the scientific study of medicinal plants.[12]

The most consumed plant species were boldo*(P. boldus)* (35.4%), Fennel (*Foeniculum vulgare*) (24.2%), balm mint (*M. officinalis)* (22.5%), lemongrass (*C. citratus)* (6.4%), chamomile (*M. chamomilla)* (4.8%), carqueja*(B. trimera)* (3.2%), and mint (*Mentha piperita L.*) (3.2%). In a study of the use of medicinal plants by pregnant women,[13] the most cited were balm mint (79.5%), boldo (41%), and anise (28%). In the study performed by Veiga Júnior,[11] boldo was also the most cited

plant (14.7%). In another study on the use of medicinal plants by pregnant women, the most used were boldo (35.2%), lemongrass (21.5%), and mint (15.6%).[10]

In a comparison of the plants most used by pregnant women with those contraindicated during pregnancy, based on Resolution SES/RJ No. 175714, six of the seven most cited plants are listed. Thus, there is a clear need to establish safety criteria for the use of medicinal plants during pregnancy. These criteria should take into account studies on the toxicity of phytotherapeutic products in pregnancy, including their actions on the fetus, and the possible adverse effects on the mother.

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