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BRIEF REPORT

Chinese herbal medicines used in pregnancy: a population-based survey in Taiwan†

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SUMMARY

Purpose To explore the use (prevalence and related factors) of Chinese herbal medicines used by pregnant women.
Methods We used multistage stratified systematic sampling to recruit 2048 postpartum women from the Taiwan national birth register between November and December 2003. Subjects underwent a home interview 6 months after their deliveries. A structured questionnaire was successfully applied to 87% of the sampled population.
Results At least one Chinese herbal medicine was used during pregnancy by 24.1% of the interviewed subjects. Pregnant women with threatened abortion appeared to use more Chinese herbal medicines than other pregnant women.
Conclusion Chinese herbal medicines are frequently used by pregnant women in Taiwan and are very frequently used by those with a threatened abortion. Copyright © 2006 John Wiley & Sons, Ltd.

KEY WORDS — Chinese herbal medicine; pregnant women; prevalence rate; related factors; threatened abortion

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INTRODUCTION

The use of herbal medicines during pregnancy is common in many countries.[1,2] One study showed that white women and high education[3] were the factors associated with high use of herbal medicines during pregnancy in western countries. Another study showed that maternal education, occupation and maternal previous abortion or stillbirth were the factors related to Taiwanese pregnant women using Chinese herbal medicines.[2]

There were inconclusive results in human depending on different herbs for different purposes in pregnancy,[4–6] but two animal studies have shown that potential adverse foetal effects can result from the use

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† This study was based on the data from Taiwan Birth Cohort Study Pilot Database.

of herbal medicines.[7,8] There exists a general lack of evidence about the use of herbal medicines in human pregnancy. Thus in this study, the prevalence and related factors of using Chinese herbal medicines during pregnancy have been explored.

MATERIALS AND METHODS

Study population and sampling strategy

We set up a prospective longitudinal cohort study: the first national birth cohort study in Taiwan (the Taiwan Birth Cohort Study, TBCS). This study began in July 2003. The target of TNBCS includes 25 000 pairs of mothers and their newborns. The babies will be followed at 6 months, 18 months and 3 years of age.

In the pilot study of TBCS, we used multistage stratified systematic sampling to obtain representative samples from the Taiwan national birth registration data between November and December 2003. Using the principle of proportion probability to size, we randomly sampled 29 towns in Taiwan. All postpartum women and newborns, a total of 2048 pairs, from these 29 towns were recruited.[9]

Data collection

We conducted a home interview with the 2048 postpartum women 6 months after their deliveries by using a structured questionnaire in the period from April to June 2004. There were 265 cases of loss to follow-up because of refusal to participate ($n = 144$), moving home ($n = 42$), incorrect addresses ($n = 35$), going abroad ($n = 20$), infant deaths ($n = 14$), adopted infants ($n = 3$) and other miscellaneous reasons ($n = 7$). A total of 1783 postpartum women were interviewed. The completed interview rate was 87%.

Variables

Data were obtained from the interview questionnaire. The population was grouped by age: 19 years old and below, 20–34, and 35 or above. The educational levels were stratified into three groups: university and college or above, senior high school and junior high school and below. The classification of occupation was summarised into two groups: occupation and no occupation. Family income per year was defined as the total parental income per year within five categories expressed in new Taiwan dollars (NT$, new Taiwan dollars, 1 US$ $\approx$ 32 NT$ in 2005): 390 000 or lower, 400 000–590 000, 600 000–990 000, 100 000–149 000, and 1 500 000 or higher. Place of residence was stratified into three groups: urban areas, town centres of rural areas and rural areas.

The content of Chinese herbal medicines was classified according to a previous study in Taiwan.[2] They were grouped as An-Tai-Yin, Pearl powder, Huanglian, Szu-Wu-Tang, Ginseng and others (Table 1).

Information related to infants such as gender, birth weight and gestational weeks was obtained from the national Taiwan birth register. Data on congenital anomalies were obtained from the national Taiwan congenital anomaly register. Low birth weight (LBW) refers to babies with birth weight below 2500 g and preterm delivery to babies born before 37 completed weeks (259 days) of gestation.

Table 1. Prevalence of Chinese herbal medicines used among pregnant women in Taiwan ($N = 1783$)

Chinese herbal medicine	Type	Ingredients	*N* (%)
Any one	—	—	430 (24.1)
An-Tai-Yin	Formula	Fritillariae Bulbus, Zingiber Rhizoma, Angelicae Radix, Glycyrrhizae Radix, Ligustici Rhizoma, PaeoniaeLactifloraeRadix, Astragali Radix, Notopterygii Rhizoma, Magnoliae Cortex, Schizonepetae Herba, Citri Immaturus Fructus, Artemisiae Argyi Folium, and Cuscutae Semen	247 (13.9)
Pearl powder	Single	Margarita	86 (4.8)
Huanglian	Single	Coptidis Rhizoma	78 (4.4)
Szu-Wu-Tang	Formula	Rehmanniae Radix, Paeoniae Radix, Angelicae Sinensis Radix, and Chuanxiong Rhizoma	58 (3.3)
Ginseng	Single	Ginseng Radix	25 (1.4)
Others	—	—	56 (3.1)

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Statistical analysis

Multiple logistic regression was performed to estimate odds ratios (ORs) and the 95% confidence intervals (CIs) of the dichotomous outcomes after adjusting for potential confounding by maternal age, education, occupation, family income per year (NT$), place of residence, threatened abortion, diabetes mellitus, hypertension during pregnancy, previous history of abortion or stillbirth, parity and infant sex. This statistical analysis was performed using SPSS for Windows, Release 11.0.

RESULTS

Most of the subjects were in the category 20–34 years old (87.6%). There was a predominance of senior high

Table 2. Risk factors of pregnancy-related Chinese herbal medicine utilisation among pregnant women in Taiwan ($N = 1783$)

Risk factors	Chinese herbal medicines used			
	Yes ($N = 430$) No. (%)	No ($N = 1353$) No. (%)	cOR (95%CI)	aOR (95%CI)
Maternal age (years)				
≤19	9 (2.1)	51 (3.8)	0.53 (0.26, 1.09)	0.57 (0.27, 1.20)
20–34[a]	390 (90.7)	1172 (86.6)	1.00	1.00
≥35	31 (7.2)	130 (9.6)	0.72 (0.48, 1.08)	0.77 (0.50, 1.18)
Maternal education				
Junior high school −	62 (14.4)	302 (22.3)	0.56 (0.41, 0.76)[#]	0.64 (0.46, 0.88)[**]
Senior high school[a]	291 (67.7)	794 (58.7)	1.00	1.00
University +	77 (17.9)	257 (19.0)	0.82 (0.61, 1.09)	0.77 (0.57, 1.05)
Maternal occupation				
No[a]	156 (36.3)	557 (41.2)	1.00	1.00
Yes	274 (63.7)	796 (58.8)	1.23 (0.98, 1.54)	1.14 (0.89, 1.45)
Family per year (NT$)				
≤390 000[a]	85 (19.8)	292 (21.6)	1.00	—
400 000–590 000	93 (21.6)	281 (20.8)	1.14 (0.81, 1.60)	
600 000–990 000	159 (37.0)	454 (33.5)	1.20 (0.89, 1.63)	
100 000–149 000	62 (14.4)	254 (18.8)	0.84 (0.58, 1.21)	
≥1500 000	31 (7.2)	72 (5.3)	1.48 (0.91, 2.40)	
Place of residence				
Urban areas[a]	222 (51.6)	679 (50.2)	1.00	1.00
Town centres of rural areas	83 (19.3)	282 (20.8)	0.90 (0.68, 1.20)	0.95 (0.71, 1.28)
Rural areas	125 (29.1)	392 (29.0)	0.98 (0.76, 1.26)	1.00 (0.77, 1.31)
Threatened abortion				
No[a]	312 (72.6)	1117 (82.6)	1.00	1.00
Yes	118 (27.4)	236 (17.5)	1.79 (1.39, 2.31)[#]	1.71 (1.32, 2.22)[#]
Diabetes during pregnancy				
No[a]	417 (97.0)	1315 (97.2)	1.00	1.00
Yes	13 (3.0)	38 (2.8)	1.08 (0.57, 2.05)	1.03 (0.53, 2.00)
Hypertension during pregnancy				
No[a]	419 (97.4)	1320 (97.6)	1.00	1.00
Yes	11 (2.6)	33 (2.4)	1.05 (0.53, 2.10)	0.98 (0.48, 2.00)
Previous abortion or stillbirth				
Never[a]	297 (69.1)	991 (73.2)	1.00	1.00
Ever	133 (30.9)	362 (26.8)	1.23 (0.97, 1.55)	1.22 (0.95, 1.56)
Parity				
1[a]	232 (54.0)	680 (50.2)	1.00	1.00
2	156 (36.3)	514 (38.0)	0.89 (0.70, 1.12)	0.86 (0.67, 1.09)
≥3	42 (9.8)	159 (11.8)	0.77 (0.53, 1.12)	0.79 (0.53, 1.17)
Gender of infant				
Male[a]	224 (52.1)	762 (56.3)	1.00	1.00
Female	206 (47.9)	591 (43.7)	1.19 (0.95, 1.47)	1.20 (0.96, 1.49)

Abbreviations: cOR, crude odd ratio; aOR, adjusted odd ratio; CI, confidence interval; NT$, new Taiwan dollars.
[a]Reference category.
[**]$p < 0.01$.
[#]$p < 0.001$.

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school education (60.9%), with a job (60.0%) and more residing in urban areas; (50.5%); 34.4 % of the families had an annual income of 600 000–990 000 NT$. The prevalence of threatened abortion, diabetes, and hypertension during the current pregnancy was 19.9%, 2.9% and 2.5%; 27.8% of the subjects had previous spontaneous abortion or stillbirth. About half of the mothers were primipara (51.1%) and 55.3% of the infants were male. LBW, preterm delivery and congenital malformations occurred in 7.0%, 8.3% and 0.9%, respectively.

Prevalence rates of Chinese herbal medicines used during pregnancy are shown in Table 1. The overall prevalence of pregnant women taking Chinese herbal medicines was 24.1%. The five most commonly used Chinese herbal medicines were An-Tai-Yin (13.9%), Pearl powder (4.8%), Huanglian (4.4%), Szu-Wu-Tang (3.3%) and Ginseng (1.4%).

Risk factors of pregnancy-related Chinese herbal medicines utilisation are shown in Table 2. After adjustment for all other variances, pregnant women with a threatened abortion (OR 1.71; 95%CI 1.32, 2.22) seemed to use more Chinese herbal medicines.

KEY POINTS

- It is common that Taiwanese pregnant women used Chinese herbal medicines.
- Pregnant women with a threatened abortion during pregnancy frequently used Chinese herbal medicines.
- Caution should be exercised regarding the use of Chinese herbal medicines during pregnancy as safe conditions for such usage have not been established.

DISCUSSION

We found a high overall prevalence rate of using Chinese herbal medicines (24%) among pregnant women in Taiwan. However, the representativeness of sampling and the validity of measurement in our study must be considered before reaching any conclusion.

The characteristics of non-responders need to be concerned. There were no significant differences of characteristics including parents' age and gender, LBW and congenital malformations of their newborns between the responders and the non-responders. However, the rate of preterm delivery births in the non-responders (12.1%) was significantly higher than that in the responders (8.3%). The potential selection bias might exist because some of preterm babies were not recruited to respond. It might, therefore, lead to underestimate the prevalence of using Chinese herbal medicines if preterm babies were related to the use of herbal medicines during pregnancy.

To reduce recall bias we only recruited subjects with a completed interview at 6 months after their deliveries, and examined whether they used Chinese herbal medicines, without including frequency or dose. Traditional Taiwanese belief is that there is no relationship between common Chinese herbal medicines used during pregnancy and adverse effects on either maternal or infant health. These medicines are widely believed to be harmless. Thus, in this pilot study we have set out to collect exposure data rather than outcome data: the follow-up parts of the study will yield information on outcomes, including malformations. In addition, the home interviews using a structured questionnaire applied by well-trained interviewers were thought to be of special value in this study and seemed likely to have minimised recall bias with regard to exposure information.

Comparison with one previous study[2] would suggest that pregnant women using traditional Chinese herbal medicines seemed to have become more cautious in Taiwan. This phenomenon might also be related to the national health insurance program, launched in 1995, and the increased accessibility of western prenatal care in Taiwan. All pregnant women in this survey were cared for by obstetricians under the national health insurance program and 97% of them started their prenatal care during the first trimester.

Pregnant women with a threatened abortion seemed to use more Chinese herbal medicines in our survey. This was similar to one study[2] in which there was a consistent pattern of using Chinese herb medicines during pregnancy when the women had troubles in pregnancy.

This pilot survey showed that Chinese herbal medicine was frequently used among pregnant women in Taiwan; this was especially so among those with threatened abortion. The findings in this study suggest that the importance of future research to clarify the efficacy and safety, both maternal and foetal, of herbal medicines used during pregnancy.

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