

## Prevalence and related factors of Chinese herbal medicine use in pregnant women of Taipei, 1985-1987

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**Objectives:** The use of herbal medicines during pregnancy is becoming fashionable. The purpose of this study is to explore the prevalence and related factors of pregnant women using Chinese herbal medicines in Taipei. **Methods:** During 1985-87, a total of 10,756 pregnant women with 26 or more weeks of gestation who came to the Taipei Municipal Maternal and Child Hospital for prenatal care, were interviewed by trained interviewers using structured questionnaires to obtain detailed information. Multiple logistic regressions were used to estimate odds ratios of the dichotomous outcomes such as Chinese herbal medicines, medicines and supplements during different time periods. **Results:** The use of at least one herbal medicine was 6.9% before pregnancy and 42.3% during pregnancy. Before pregnancy, women used significantly more Chinese herbal medicines associated with lower family incomes, primipara, gynecological diseases, and irregular cycles of menstruation. During pregnancy, pregnant women with characteristics of lower education, a non-professional job, previous spontaneous or induced abortion or stillbirth, and women carried HBsAg virus tended to use Chinese herbal medicines. **Conclusions:** This mid-1980s' survey showed that Chinese herbal medicines were frequently used before and during pregnancy in Taipei women, especially among those with low socio-economic levels. It deserves future studies to clarify their potential health effects on fetuses and enquire about such habits during prenatal care. (*Taiwan J Public Health*. 2005;24(4):335-347)

**Key Words:** Chinese herbal medicine, pregnant women, prevalence, related factors

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Received: Oct 14, 2004 Accepted: Feb 21, 2005

### INTRODUCTION

Traditional medicine or complementary and alternative medicine (TM/CAM) is becoming more widely used in most countries throughout the world [1-7]. One of the popular practices of TM/CAM is herbal medicine [1-8]. Many women use herbal medicines during their pregnancy [9-13], and such practices are considered as part of dietary supplements in the United States [14]. Because use of all kinds of medicines during pregnancy might produce potential adverse effects on mothers and fetuses, such practices raise concerns among public health practitioners and

consumers on the issue of safety and efficacy [9-10,15].

Studies of maternal drug consumption during pregnancy have been carried out over the last several decades [16-22]. Although many studies have been published on medication used in pregnancy, there was a general lack of evidence for safety and efficacy about use of herbal medicines in pregnancy. In fact, most of them focused on simple botanical products, i.e. Echinacea [23] or Raspberry [24]. Even though the result was not consistent [10,23-24], one animal study demonstrated that ginseng, a commonly used herbal medicine, exerted direct teratogenic effects on rat embryos [25]. Besides, common use of herbal medicine also involved following additional problems, which include misidentification of herbs, contamination from microbes, heavy metals, or pesticides, might be adulterated with western medicines, and potential herbal toxicity [26-29]. Though such practices may produce potential hazards, it is still becoming fashionable in western countries [1,30].

In addition to the concerned effects of herbal medicines, policy makers might also be interested in the related factors of such practices among people. Previous studies showed education, health status or philosophies are related factors associated with using CAM [31-33], especially on the Traditional Chinese Medicine uses in Taiwan [34]. A study conducted in Taiwan showed that health states and health concern were more influential than gender, age, education, and urbanization of residential areas [35]. In a word, relatively little has been known about the overall prevalence, related factors, and the safety or efficacy of using herbal medicines for pregnant women. In this study, the prevalence and the related factors of using Chinese herbal medicines during pregnancy were examined on a prenatal clinic in a municipal hospital for maternal and child health.

## MATERIALS AND METHODS

It was a cross-sectional study. Between 1985 and 1987, the study was conducted at the Taipei Municipal Maternal and Child Hospital (TMMCH). Each pregnant woman with 26 or more weeks' gestation who came to this hospital for antenatal care was enrolled into the study and interviewed by three standardized interviewers using structured questionnaires to obtain detailed information [36]. A total of 10,756 pregnant women were recruited from July 1985 to June 1987. The risk factors of industrial and occupational classifications were validated. An exposure validation, which linked job titles with exposures at the workplace was conducted during the study [37]. One medical assistant reviewed and abstracted information from medical records of mothers and newborns. Cord blood samples were also collected and blood lead measurements were conducted [38-39]. All study participants provided informed consent, which was approved by the National Taiwan University College of Public Health Ethics Review Board.

Data on maternal age, education, occupation, and family income were obtained from the interview questionnaire. Education was stratified into four groups: university and college or above, senior high school, junior high school, and primary school and below. The classifications of occupations were according to the modified Taiwan version of International Classification of Occupations [40], which was later summarized into six groups: professional occupations, clerical occupations, sales, services, fabricators, and housewives. Family income was defined as the total parental monthly income (NT\$, new Taiwan dollars, 1 US\$  $\approx$  33 NT\$, in 2004) with four categories: 40,000 or higher, 30,001-40,000, 20,001-30,000, and 20,000 or lower per month.

Previous gynecological, obstetric history and irregular cycle of menstruation were obtained from the interview questionnaire. Perina-



tal outcomes included previous spontaneous abortion or stillbirth, previous induced abortion, previous LBW (low birth weight) or preterm delivery. Gynecological diseases included uterus diseases, ovary or fallopian tube diseases and infertility. LBW refers to babies with birthweight below 2,500gm and preterm delivery to babies born before 37 completed weeks (259 days) of gestation [41], as measured from the first day of the last menstrual period (LMP). Irregular cycle of menstruation was defined as three groups: regular, irregular and uncertainty. Regular group meant the frequency of menstruation differed below seven days.

Laboratory data on the test for hepatitis B virus in the current pregnancy were obtained from the maternal medical records, which were abstracted and coded. The use of Chinese herbal medicines, medicines, and vitamin supplements or iron preparations during prenatal period was obtained from questionnaires on prenatal care visits. Medicines were defined as medication prescribed by doctors for dysfunctional uterine bleeding or oral contraceptive use during one-year period before current pregnancy or medication for nausea or vomiting or treatment for threatened abortion during pregnancy. Chinese herbal medicine was defined as any botanical material or preparation with therapeutic or other human health benefits, which contains either raw or processed ingredients from one or more plants. Materials of inorganic or animal origin may also be present [42]. Supplements were defined as vitamins or iron preparation. The content of interview about herbal medicines was reported previously [43]. In brief, data were gathered on several common and less common Chinese herbal medicines according to three different time periods: the one year period before pregnancy, the first trimester, and the second and third trimesters. Tiao-Jing-Wan, Jung-Jiang-Tang, and Bai-Fung-Wan were generally taken before pregnancy only; Ba-Zhen-Tang, Szu-Wu-Tang,

Ginseng, and Huanglian might be taken before and during pregnancy; and An-Tai-Yin/ Shih-San-Wei, and Dang-Gui- Saho-Yao-San were usually taken during pregnancy only. The detailed content of Chinese herbal medicines was shown in the appendix.

"Before pregnancy" was the period limited to only one-year before pregnancy. First trimester was defined as the time period from the date of conception (taken as the first date of LMP) to day 90 of gestation, second trimester from day 91 to day 180, and third trimester from day 181 to the date of birth. Pregnancy was defined as the time period from the date of conception to the date of birth [44].

The frequencies of use of Chinese herbal medicines, medicines, and supplements were first stratified according to different periods of pregnancy. Multiple logistic regression analyses were performed to estimate odds ratio with 95% confidence intervals of these dichotomous outcomes according to different determinants, including maternal age, maternal education, maternal occupation, family income per month (NT\$), parity, previous spontaneous abortion or stillbirth, previous induced abortion, previous LBW or preterm delivery, gynecological disease, irregular cycle of menstruation, and maternal HBsAg test. This study was analyzed using SPSS for Windows, Release 10.0.

## RESULTS

Frequency distributions of use of Chinese herbal medicines, medicines and supplements were shown in Table 1. The overall prevalence of pregnant women taking Chinese herbal medicines and supplements highly increased. Chinese herbal medicines, medicines and supplements were 6.9%, 9.5% and 1.1% before pregnancy, and 42.3%, 17.4% and 43.0% during pregnancy accordingly.

Our results showed that the correlation co-

Table 1. Prevalence of Chinese herbal medicines, medicines and supplements use in pregnant women of Taipei (N=10,756)

Use in pregnant women	Before pregnancy	First trimester	Second and third trimesters	During pregnancy
<b>Chinese herbal medicines</b>				
Any one	738 (6.9)	1929 (17.9)	3204 (29.8)	4555 (42.3)
For dysfunctional uterine bleeding	325 (3.0)	-	-	-
For treatment for threatened abortion	-	1405 (13.1)	2835 (26.4)	3760 (35.0)
For nausea or vomiting	-	221 (2.1)	36 (0.3)	244 (2.3)
Other reasons	466 (4.3)	347 (3.2)	380 (3.5)	695 (6.5)
<b>Medicines</b>				
Any one	1020 (9.5)	1629 (15.1)	237 (2.2)	1876 (17.4)
For dysfunctional uterine bleeding	362 (3.4)	-	-	-
Oral contraceptives	687 (6.4)	-	-	-
For treatment of threatened abortion	-	1307 (12.2)	213 (2.0)	1495 (13.5)
For nausea or vomiting	-	428 (4.0)	28 (0.3)	442 (4.1)
<b>Supplements</b>				
Any one	117 (1.1)	905 (8.4)	4432 (41.2)	4626 (43.0)
Iron preparation	8 (0.1)	27 (0.3)	83 (0.8)	95 (0.9)
Vitamins	91 (0.8)	828 (7.7)	4106 (38.2)	4273 (39.7)
Other micro-nutrients	37 (0.3)	96 (0.9)	418 (3.9)	454 (4.2)

Values in parentheses are percent.

efficients among the Chinese herbal medicines, medicines, and supplements used before or each trimester was from 0.001 to 0.216. There were 16.1% and 70.2% of pregnant women who used Chinese herbal medicines, medicines, or supplements before and during trimesters, respectively as shown in Figure 1. The percentages of all of three, any two, and only one of them used was 0.0%, 0.0%-0.6%, 0.4%-8.8% before pregnancy, and 4.4%, 3.9% -15.8%, and 5.1% -18.9% during pregnancy, accordingly.

The characteristics of the subjects we interviewed were summarized in Table 2, which also showed the results of multiple logistic regressions for various related factors of using different medicines before and during pregnancy. Most of the subjects were 20 to 34 years old (95.3%) with a senior high school education (49.1%), and family incomes per month were usually above 20,000 NT\$ (65.6%). The most popular jobs were clerk (29.4%) and housewives (32.9%). About half of them were nulliparae (49%). The

prevalence of previous spontaneous abortion or stillbirth was 8.8%; that of previous induced abortion was 30.8%; while those of previous LBW or preterm delivery, gynecological diseases, irregular cycles of menstruation were 4.5%, 8.8%, and 20.6%, accordingly. The carrier rate of hepatitis B virus was 14.2%.

After adjustment for all other covariates, older pregnant women ( $\geq 35$  years) were significantly less likely to use medicines before pregnancy. Young pregnant women with an age below 20 had a significantly lower probability of taking Chinese herbal medicines during pregnancy. In general, pregnant women with lower educational level and family income per month were more likely to use Chinese herbal medicines and less to use supplements during pregnancy after adjusting for other covariates. There appeared to be an increased trend of use of Chinese herbal medicines before pregnancy along with decreased monthly family income. Women with professional jobs were significantly less

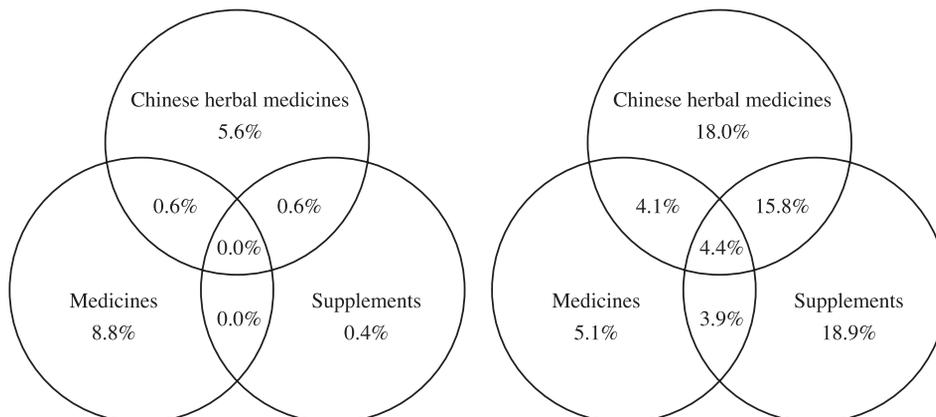


Figure 1. Relationship of Chinese herbal medicines, medicines, and supplements used before (left) and during pregnancy (right)

likely to use Chinese herbal medicines during pregnancy compared with all other occupations.

As was also shown in Table 2, primipara was significantly more likely to use Chinese herbal medicines and supplements but less likely to use medicines before pregnancy. There appeared a decreased trend of use of Chinese herbal medicines, medicines, and supplements along with increased parity during pregnancy.

Before pregnancy, women with irregular cycles of menstruation were more likely to take both medicines and Chinese herbal medicines, but women with gynecological diseases tended to take Chinese herbal medicines. Pregnant women with a previous history of spontaneous abortion or stillbirth were less likely to take medicines. Pregnant women with a previous history of induced abortion were less likely to take Chinese herbal medicines and supplements, but more likely to take medicines. During pregnancy, the subjects with any previous history of spontaneous or induced abortion, or stillbirth tended to take both Chinese herbal medicines and medicines. Pregnant women with previous LBW or preterm delivery or gynecological diseases tended to take medicines. However, pregnant

women who were carriers of the hepatitis B virus tended to take Chinese herbal medicines. There was no significant difference in supplements used before (except women with previous induced abortion) or during pregnancy, which corroborated our prior conjecture. It was interesting to find that pregnant women with a previous history of gynecological problems or diseases tended to use Chinese herbal medicines before pregnancy but they used more western medicines during their pregnancy.

## DISCUSSION

We found a high overall prevalence rate (42.3%) of pregnant women using Chinese herbal medicines during pregnancy in Taiwan, and such uses seemed to increase in frequency during second and third trimesters, which was different from the trend on the use of medicines. As the figure is much higher than those reported outside of this country [9,11-13], we must first assess the representativeness of our sample and the validity of our measurement before reaching any conclusion.

Compared with the national census data

Table 2. Related factors of pregnancy-related Chinese herbal medicines utilization in pregnant women of Taipei (N=10,756)

Related factors	No. (%)	Before pregnancy			During pregnancy		
		Chinese herbal medicines aOR (95% CI)	Medicines aOR (95% CI)	Supplements aOR (95% CI)	Chinese herbal medicines aOR (95% CI)	Medicines aOR (95% CI)	Supplements aOR (95% CI)
Age (years)							
≤19	161 (1.5)	0.53 (0.23,1.22)	1.32 (0.83,2.12)	-	0.63 (0.45,0.88)*	0.75 (0.47,1.18)	0.71 (0.50,1.00)
20-34 <sup>a</sup>	10251 (95.3)	1.00	1.00	1.00	1.00	1.00	1.00
35+	344 (3.2)	0.96 (0.62,1.51)	0.43 (0.25,0.75)*	0.70 (0.22,2.24)	0.86 (0.69,1.08)	1.24 (0.94,1.64)	1.13 (0.90,1.42)
Education							
University + <sup>a</sup>	2592 (24.1)	1.00	1.00	1.00	1.00	1.00	1.00
Senior high school	5281 (49.1)	0.95 (0.77,1.19)	1.01 (0.83,1.22)	0.41(0.26,0.66) <sup>#</sup>	1.09 (0.98,1.22)	1.10 (0.96,1.27)	0.80(0.72,0.89) <sup>#</sup>
Junior high school	1795 (16.7)	1.19 (0.89,1.57)	1.08 (0.84,1.39)	0.30(0.15,0.61) <sup>**</sup>	1.28 (1.11,1.49) <sup>#</sup>	1.04 (0.85,1.27)	0.59(0.51,0.69) <sup>#</sup>
Primary school -	1086 (10.1)	1.01 (0.73,1.41)	1.06 (0.79,1.42)	0.36(0.17,0.80) <sup>*</sup>	1.34 (1.13,1.59) <sup>#</sup>	1.12 (0.89,1.40)	0.52(0.44,0.62) <sup>#</sup>
Occupation							
Professional <sup>a</sup>	919 (8.5)	1.00	1.00	1.00	1.00	1.00	1.00
Clerical	3158 (29.4)	1.00 (0.73,1.38)	0.87 (0.67,1.14)	1.02 (0.50,2.06)	1.32 (1.12,1.55) <sup>#</sup>	1.06 (0.87,1.30)	1.03 (0.88,1.20)
Sales	1160 (10.8)	1.10 (0.75,1.60)	0.98 (0.71,1.35)	0.99 (0.40,2.43)	1.35 (1.12,1.64) <sup>**</sup>	0.88 (0.69,1.13)	0.87 (0.72,1.05)
Services	421 (3.9)	1.13 (0.69,1.85)	1.10 (0.74,1.63)	0.44 (0.05,3.56)	1.43 (1.11,1.84) <sup>**</sup>	1.24 (0.91,1.70)	1.22 (0.95,1.57)
Fabricators	1559 (14.5)	1.02 (0.70,1.49)	0.83 (0.60,1.14)	0.80 (0.30,2.19)	1.48 (1.22,1.79) <sup>#</sup>	1.00 (0.78,1.27)	0.95 (0.79,1.15)
Housewives	3539 (32.9)	0.99 (0.70,1.38)	0.96 (0.72,1.27)	1.46 (0.71,3.02)	1.26 (1.06,1.50) <sup>**</sup>	0.99 (0.80,1.23)	0.92 (0.78,1.09)
Family income per month (NT\$)							
40,001 <sup>a</sup>	1086 (10.1)	1.00	1.00	1.00	1.00	1.00	1.00
30,001-40,000	2117 (19.7)	1.22 (0.88,1.70)	1.00 (0.77,1.31)	1.53 (0.76,3.08)	0.94 (0.80,1.10)	1.09 (0.89,1.34)	0.93 (0.80,1.08)
20,001-30,000	3846 (35.8)	1.41 (1.02,1.93) <sup>*</sup>	0.94 (0.73,1.22)	1.68 (0.84,3.36)	1.07 (0.92,1.24)	1.11 (0.91,1.35)	0.90 (0.78,1.05)
≤20,000	2764 (25.7)	1.53 (1.10,2.14) <sup>*</sup>	0.93 (0.71,1.22)	1.59 (0.74,3.42)	1.09 (0.93,1.27)	1.01 (0.82,1.25)	0.82 (0.70,0.96) <sup>*</sup>
Unknown	942 (8.8)	1.34 (0.90,1.99)	0.92 (0.66,1.27)	1.82 (0.74,4.48)	1.16 (0.96,1.41)	1.24 (0.97,1.60)	0.76 (0.63,0.92) <sup>**</sup>
Parity							
0 <sup>a</sup>	5267 (49.0)	1.00	1.00	1.00	1.00	1.00	1.00
1	4020 (37.4)	1.54 (1.29,1.84) <sup>#</sup>	0.84 (0.72,0.99) <sup>*</sup>	7.27(4.17,12.69) <sup>#</sup>	0.76 (0.69,0.83) <sup>#</sup>	0.78(0.69,0.88) <sup>#</sup>	0.74(0.68,0.81) <sup>#</sup>
2+	1303 (12.1)	1.29 (0.97,1.71)	1.05 (0.82,1.34)	3.31(1.43,7.66) <sup>**</sup>	0.73 (0.63,0.84) <sup>#</sup>	0.52(0.43,0.64) <sup>#</sup>	0.59(0.51,0.69) <sup>#</sup>



Table 2. Related factors of pregnancy-related Chinese herbal medicines utilization in pregnant women of Taipei (N=10,756) (continued)

Related factors	No. (%)	Before pregnancy			During pregnancy		
		Chinese herbal medicines aOR (95% CI)	Medicines aOR (95% CI)	Supplements aOR (95% CI)	Chinese herbal medicines aOR (95% CI)	Medicines aOR (95% CI)	Supplements aOR (95% CI)
Previous spontaneous abortion or stillbirth							
Never <sup>a</sup>	9645 (89.7)	1.00	1.00	1.00	1.00	1.00	1.00
Ever	947 (8.8)	1.13 (0.88,1.45)	0.68(0.52,0.89)**	0.86 (0.46,1.62)	1.22 (1.07,1.41)**	1.92(1.64,2.25)##	1.12 (0.98,1.29)
Previous induced abortion							
Never <sup>a</sup>	7272 (67.6)	1.00	1.00	1.00	1.00	1.00	1.00
Ever	3318 (30.8)	0.64 (0.53,0.76)##	1.18(1.03,1.36)*	0.44(0.28,0.71) <sup>#</sup>	1.12 (1.03,1.22)**	1.71(1.54,1.90)##	1.05 (0.97,1.15)
Previous low birthweight or preterm delivery							
Never <sup>a</sup>	10276 (95.5)	1.00	1.00	1.00	1.00	1.00	1.00
Ever	480 (4.5)	1.05 (0.74,1.51)	1.19 (0.85,1.65)	1.17 (0.58,2.35)	1.15 (0.95,1.40)	1.30(1.01,1.66)*	1.09 (0.90,1.34)
Gynecological diseases							
No <sup>a</sup>	9811 (91.2)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	945 (8.8)	1.43 (1.12,1.82)**	0.95 (0.75,1.20)	1.10 (0.67,1.68)	1.10 (0.96,1.26)	1.63(1.39,1.91)##	1.13 (0.98,1.30)
Irregular cycle of menstruation							
No <sup>a</sup>	8544 (79.4)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	2212 (20.6)	1.59 (1.34,1.89)##	2.38(2.07,2.74)##	1.06 (0.67,1.68)	1.07 (0.97,1.18)	0.98 (0.87,1.11)	0.98 (0.89,1.08)
Maternal HBsAg test							
Negative <sup>a</sup>	8664 (80.6)	1.00	1.00	1.00	1.00	1.00	1.00
Positive	1522 (14.2)	1.10 (0.89,1.35)	0.94 (0.78,1.14)	1.10 (0.66,1.83)	1.12 (1.00,1.25)*	1.03 (0.89,1.19)	0.99 (0.88,1.10)
No results	403 (3.7)	0.94 (0.63,1.42)	0.91 (0.64,1.30)	0.79 (0.25,2.54)	1.14 (0.93,1.40)	1.19 (0.92,1.53)	1.21 (0.98,1.48)

Abbreviations: aOR: adjusted odds ratio; CI: confidence interval; HBsAg: hepatitis B virus surface antigen; NT\$: new Taiwan dollars.

<sup>a</sup>: Reference category;

\*: p < 0.05;

\*\* : p < 0.01;

# : p < 0.001;

## : p < 0.0001



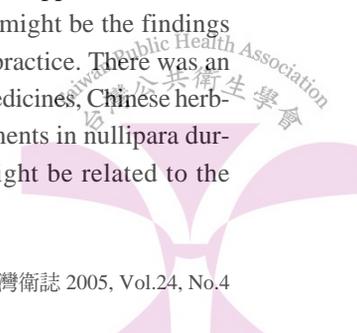
during the period of 1985-1987 [45], our sample seemed to have a higher proportion of women with an education of senior high school or above (73.2 % versus 34.7%), employment (67.1% versus 45.4%) and professional job (8.5% versus 0.5%). According to the Table 2, women with longer period of education were less likely to use Chinese herbal medicine after controlling other potential confounders. Thus, the prevalence rate in this study probably underestimates the real figure. Moreover, since our study only recruited pregnant women after 26 weeks of gestation, we were unable to evaluate any pregnancy with an outcome of spontaneous or induced abortion during early stage of pregnancy. Because pregnancy outcomes with any sign of threatened abortion were usually referred to a doctor for treatment, we might have also slightly underestimated the use of both Western and Chinese herbal medicines as some of these cases were not included if actual abortion occurred later on. However, all the information on use of medicines was obtained before the delivery of newborn baby, so the recall bias might be only minimal, if it exists. And, a lot of work was simultaneously conducted to assure the quality of data collected from interviews, including validation of occupational exposure of husband's [37] and that of subject's, as well as the pregnancy history [36]. Therefore, measurement errors were assumed minimal. Since random misclassification generally leads toward a null effect [46], the odds ratio for related factors of use of herbal medicines were at most underestimated.

One of the most probable reasons for such a high prevalence rate of Chinese herbal medicines use was the culture effect [34]. Taiwanese people who take Chinese herbal medicines generally consider that they can improve health or change the constitution of human body before pregnancy, or may help fetal growth and prevent premature delivery. Thus, we were not surprised to discover that women with a previous history of

irregular cycle of menstruation or gynecological diseases were more likely to take Chinese herbal medicines before pregnancy. Some of them probably also tried to use Chinese herbal medicines during pregnancy to prevent recurrent spontaneous abortion or stillbirth, or improve sero-conversion of viral hepatitis B, as shown in Table 2. The prevalence rates of the subjects with diabetes, hypertension, and hemorrhage during pregnancy were 0.2%, 0.7% and 0.6%, respectively, and were not related to the use of Chinese herbal medicines, medicines, and supplements in pregnancy (data not shown).

There was a low prevalence of women who used Chinese herbal medicines, medicines, or supplements together before pregnancy or in each trimester of pregnancy. However, 20.2% of the pregnant women in our study used both Chinese herbal medicines and supplements in different trimesters. Therefore, we found similar related factors including parity, previous abortion or stillbirth, previous low birthweight or preterm delivery, and gynecological diseases with the exception of education. This phenomenon did not exist in the pregnant women who used either Chinese herbal medicines and medicines (8.5%) or medicines and supplements (8.3%).

According to traditional Taiwanese custom, women are taught by their mothers or mother-in-laws to take Chinese herbal medicines such as Sheng-Hua-Tang [47] and Szu-Wu-Tang to recuperate from the delivery of a newborn baby. Such a practice usually lasts from the date of childbirth to more than one month after delivery. Our data showed that multipara used more Chinese herbal medicines and supplements before pregnancy than nullipara might be the findings resulting from the above practice. There was an increased trend of using medicines, Chinese herbal medicines, and supplements in nullipara during pregnancy, which might be related to the



more cautious attitude and anxiety about their first pregnancy. Young pregnant women with an age below 20 were found less likely to take herbal medicines than older women during pregnancy, which might partially be explained by the reduced influence from her family (including their mothers) because of leaving home early.

Women with lower education were found to use more Chinese herbal medicines, but less supplements during pregnancy, while subjects with a higher family income or a professional job used less Chinese herbal medicine before and during pregnancy, respectively. Comparing to other CAM studies [11,31-32], our study showed an almost completely reversed trend. One of the major reasons was that Western women of high socio-economic levels might have a greater opportunity to receive new foreign knowledge and use herbal medicines earlier, while taking Chinese herbal medicines before or during pregnancy and after delivery is a traditional culture for Taiwanese.

Since the data of this study were collected in mid-1980, it raised a concern whether such practices have persisted so far. After 1995, the Chinese herbal medicine was included in the Taiwan National Health Insurance. According the National Health Insurance data, the frequency ratios of using Chinese herbal medicine and Western medicine outpatient services among patients with complications of pregnancy, childbirth and the puerperium increased consistently during 1998-2002 and were 0.027, 0.028, 0.033, 0.034, and 0.055 accordingly [48]. In addition, there has been no special movement among people or any governmental regulation change on the use of Chinese herbal medicines in pregnancy during the last two decades. Thus, our study still provided important information about the common practice of use of Chinese herbal medicines in pregnant women in Taiwan.

There is another major difference on the use

of herbal medicines between Western countries and those of traditional Chinese medicines, which usually comprise multiple products from plants and animals and can usually be purchased from local Chinese herbal stores [28,43], as also shown in appendix of this study. Moreover, we found that overall 75% of pregnant women directly bought their Chinese herbal medicines from local Chinese herbal stores. For example, 98% of Huanglian which pregnant women used was obtained from the Chinese herbal stores without any prescription. This phenomenon reminded us that it is crucial for hospital staff to enquire about such habits during prenatal care.

In conclusion, this 1980s' survey showed that Chinese herbal medicines were frequently used before and during pregnancy in Taipei women, especially among those with low socio-economic level. It deserves future studies to clarify their potential health effects on fetuses and enquire about such habits during prenatal care.

## ACKNOWLEDGMENTS

This study was partly supported by the grants from the Bureau of Health Promotion, Department of Health, Taiwan (BHP-PHRC-92-4 and DOH93-HP-1702).

## REFERENCES

1. Goldbeck-Wood S, Dorozynski A, Lie LG, Zinn C, Josefson D, Ingram M. Complementary medicine is booming worldwide. *Br Med J* 1996;**313**:131-3.
2. Eisenberg DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States, 1990-1997: Results of a follow-up national survey. *JAMA* 1998;**280**:1569-75.
3. Hong CD. Complementary and alternative medicine in Korea: Current status and future prospects. *J Altern Complement Med* 2001;**7**(Suppl 1):S33-40.
4. Pam FL, Cushman LF, Kronenberg F, Wade C, Kalmuss D. Use of Complementary and alternative medicine among women in New York city: A pilot study. *J Altern Complement Med* 2001;**7**:659-66.
5. MacLennan AH, Wilson DH, Taylor AW. Prevalence

- and cost of alternative medicine in Australia. *Lancet* 1996;**347**:569-73.
6. Thomas KJ, Nicholl JP, Coleman P. Use and expenditure on complementary medicine in England: a population based survey. *Complement Ther Med* 2001;**9**:2-11.
  7. Ni H, Simile C, Hardy AM. Utilization of complementary and alternative medicine by United States adults: results from the 1999 national health interview survey. *Med Care* 2002;**40**:353-8.
  8. Chez RA, Jonas WB. Complementary and alternative medicine. Part I: clinical studies in obstetrics. *Obstet Gynecol Surv* 1997;**52**:704-8.
  9. Nordeng H, Havnen GC. Use of herbal drugs in pregnancy: a survey among 400 Norwegian women. *Pharmacoepidemiol Drug Saf* 2004;**13**:371-80.
  10. Tiran D. The use of herbs by pregnant and childbearing women: a risk-benefit assessment. *Complement Ther Nurs Midwifery* 2003;**9**:176-81.
  11. Hepner DL, Harnett M, Segal S, Camann W, Bader AM, Tsen LC. Herbal medicine use in parturients. *Anesth Analg* 2002;**94**:690-3.
  12. Gibson PS, Powrie R, Star J. Herbal and alternative medicine use during pregnancy: a cross-sectional survey. *Obstet Gynecol* 2001;**97**(Suppl):S44-5.
  13. Tsui B, Dennehy CE, Tsourounis C. A survey of dietary supplement use during pregnancy at an academic medical center. *Am J Obstet Gynecol* 2001;**185**:433-7.
  14. Tesch BJ. Herbs commonly used by women: an evidence-based review. *Am J Obstet Gynecol* 2003;**188**:S44-55.
  15. Pinn G, Pallett L. Herbal medicine in pregnancy. *Complement Ther Nurs Midwifery* 2002;**8**:77-80.
  16. Brocklebank JC, Ray WA, Federspiel CF, Schaffner W. Drug prescribing during pregnancy: A controlled study of Tennessee Medicaid recipients. *Am J Obstet Gynecol* 1978;**132**:235-44.
  17. Piper JM, Baum C, Kennedy DL. Prescription drug use before and during pregnancy in a Medicaid population. *Am J Obstet Gynecol* 1987;**157**:148-56.
  18. Piper JM, Mitchel EF. Prenatal exposure to prescribed drugs in Tennessee Medicaid, 1983-1988. *Paediatr Perinat Epidemiol* 1991;**5**:402-9.
  19. Collaborative Group on Drug Use in Pregnancy. Medication during pregnancy: an international co-operative study. *Int J Gynaecol Obstet* 1992;**39**:185-96.
  20. Collaborative Group on Drug Use in Pregnancy. Use of psychotropic drugs during pregnancy: A report of the international co-operative drug use in pregnancy (DUP) study. *Eur J Clin Pharmacol* 1993;**45**:495-501.
  21. Lacroix I, Damase-Michel C, Lapeyre-Mestre M, Montastruc JL. Prescription of drugs during pregnancy in France. *Lancet* 2000;**356**:1735-6.
  22. Hansan WF, Peacock AE, Yankowitz J. Safe prescribing practices in pregnancy and lactation. *J Midwifery Women Health* 2002;**47**:409-21.
  23. Gallo M, Sarkar M, Au W, et al. Pregnancy outcome following gestational exposure to Echinacea: A prospective controlled study. *Arch Intern Med* 2000;**160**:3141-3.
  24. Simpson M, Parsons M, Greenwood J, Wade K. Raspberry leaf in pregnancy: its safety and efficacy in labor. *J Midwifery Women Health* 2001;**46**:51-9.
  25. Chan LY, Chiu PY, Lau TK. An in-vitro study of ginsenoside Rb1-induced teratogenicity using a whole rat embryo culture model. *Hum Reprod* 2003;**18**:2166-8.
  26. Penson RT, Castro CM, Seiden MV, Chabner BA, Lynch TJ. Complementary, alternative, integrative, or unconventional medicine? *Oncologist* 2001;**6**:463-73.
  27. Angell M, Kassirer JP. Alternative medicine- the risks of untested and unregulated remedies. *N Engl J Med* 1998;**339**:839-41.
  28. Ko RJ. Adulterants in Asian Patent Medicines. *N Engl J Med* 1998;**339**:847.
  29. Cosyns JP. Aristolochic Acid and 'Chinese Herbs Nephropathy': A review of the evidence to date. *Drug Safety* 2003;**26**:33-48.
  30. WHO. WHO Traditional Medicine Strategy 2002-2005. Geneva: WHO, 2002.
  31. Astin JA. Why patients use alternative medicine: results of a national study. *JAMA* 1998;**279**:1548-53.
  32. Cherrington A, Lewis CE, McCreath HE, Herman CJ, Richter DL, Byrd T. Association of complementary and alternative medicine use, demographic factors, and perimenopausal symptoms in a multiethnic sample of women-the ENDOW study. *Fam Community Health* 2003;**26**:74-83.
  33. Adams C, Cannell S. Women's beliefs about "natural" hormones and natural hormone replacement therapy. *Menopause* 2001;**8**:433-40.
  34. Chen YC. Chinese values, health and nursing. *J Adv Nurs* 2001;**36**:270-3.
  35. Lew-Ting CY. Who uses non-biomedical, complementary and alternative health care? Sociodemographic undifferentiation and the effects of health needs. *Taiwan J Public Health* 2003;**22**:155-66.
  36. Chang PJ, Wang JD. The accuracy of occupational histories obtained from spouse. In: Hogetedt C, Reuterwall C, eds. *Progress in occupational epidemiology*. Amsterdam: Elsevier Science Publishers B.V., 1988;53-62.



37. Hwang PH, Wang JD, Chang PJ, et al. The accuracy of occupational exposure histories by questionnaire interviewers. *Natl J Public Health Assoc (ROC)* 1987; **7**:35-42.
38. Wang JD, Shy WY, Chen JS, Yang KH, Hwang YH. Parental occupational lead exposure and the lead concentration of newborn cord blood. *Am J Ind Med* 1989; **15**:111-5.
39. Hwang YH, Wang JD. Temporal fluctuation of the lead level in the cord blood of neonates in the Taipei. *Arch Environ Health* 1990; **45**:42-5.
40. Directorate-General of Budget, Accounting & Statistics. Standard Classification of Industries and Occupations, Republic of China. Taipei: Directorate-General of Budget, Accounting & Statistics, 1983.
41. Cunningham FG, Gant NF, Leveno KJ, Gilstrap III LC, Hauth JC, Wenstrom KD. Preterm birth. In: *Williams Obstetrics*. 21st ed. New York: McGraw Hill, 2001:690.
42. WHO. General guidelines for methodologies on research and evaluation of Traditional Medicines. Geneva: WHO, 2000;27.
43. Syu CC, Wang JD, Shen CY, Chen SC. Prescription pattern of Chinese herb drugs among herb drug stores and Chinese herb doctors in Taipei. *Natl J Public Health Assoc (ROC)* 1987; **6**:91-104.
44. Cunningham FG, Gant NF, Leveno KJ, Gilstrap III LC, Hauth JC, Wenstrom KD. Fetal growth and development. In: *Williams Obstetrics*. 21st ed. New York: Mc Graw Hill, 2001;130.
45. Directorate-General of Budget, Accounting & Statistics. Manpower statistic annual report, 2004. Taipei: Census Bureau, Directorate-General of Budget, Accounting & Statistics (DGBAS), 1985-7. Available from: URL: [http://www.dgbas.gov.tw/census~n/four/yrtable4\\_5\\_13.xls](http://www.dgbas.gov.tw/census~n/four/yrtable4_5_13.xls)
46. Rothman KJ, Greenland S. Precision and validity in epidemiological studies. In: Rothman KJ, Greenland S, eds. *Modern Epidemiology*. 2nd ed. Philadelphia: Lippincott-Raven Publisher, 1998;115-34.
47. Chen LL, Wang CC. Attitude and behaviour towards postpartum recuperation in Traditional Chinese Medicine. *J Nurs Res (ROC)* 2000; **8**:49-58.
48. Department of Health. Health and National Health Insurance Annual Statistic Information Services. Taipei: Department of Health, 2003. Available from: URL: <http://www.doh.gov.tw/statistic/index.htm>

## APPENDIX

The using time and the major category of herbal medicines:

Only before pregnancy:

1. Tiao-Jing-Wan (調經丸, a compound product; pill): Rehmanniae Radixet Rhizom, Citrus Sinensis Exocarpium, Eucommiae Cortex, Ligustici Rhizoma, Paeoniae Lactiflorae Radix, Angelicae Radix, Cistanchis Caulis, Foeniculi Fructus, Corydalis Tuber, Citrus Undeveloped Exocarpiu, Linderae Radix, Cyperi Rhizoma, Scutellariae Radix, Sepiae Os, and Honey.
2. Jung-Jiang-Tang (中強湯, a compound product; decoction): PaeoniaeLactifloraeRadix, Angelicae Radix, Cinnamomi Cortex, Ligustici Rhizoma, Atractylodis Rhizoma, Hoelen, Moutan Radicis Cortex, CitrusSinensisExocarpium, Cyperi Rhizoma, Rehmanniae Radixet Rhizom, Glycyrrhizae Radix, Persicae Semen, Coptidis Rhizoma, Zingiberis Rhizoma, Caryophylli Flos, and Ginseng Radix.
3. Bai-Fung-Wan (白鳳丸, a compound product; pill): Cyperi Rhizoma, Atractylodis Rhizoma, Astragali Radix, Ginseng Radix, Ligustici Rhizoma, Hoelen, Angelicae Radix, Zingiberis Rhizoma, Cyperi Rhizoma, Foeniculi Fructus, Paeoniae Lactiflorae Radix, Cinnamomi Cortex, Psoraleae Ftuctus, Artemisiae Argyi Folium, Linderae Radix, Glycerrhizae Radix, and Evodiae Fructus.

Before and during pregnancy:

1. Ba-Zhen-Tang (八珍湯, a compound product; decoction): Angelicae Sinensis Radix, Chuanxiong Rhizoma, Paeoniae Alba Radix, Rehmanniae Radixet Rhizoma, Ginseng Radix, Atractylodis Macrocephalae Rhizoma, Poria, Glycyrrhizae Radix, Zingiberis Rhizoma, and Jujubae Fructus.
2. Szu-Wu-Tang (四物湯, a compound product; decoction): Rehmanniae Radix, Paeoniae Radix, Angelicae Sinensis Radix, and Chuanxiong Rhizoma.
3. Ginseng (人參, a single product): Ginseng Radix.
4. Huanglian (黃連, a single product; capsule): Coptidis Rhizoma.

Only during pregnancy:

1. An-Tai-Yin/ Shih-San-Wei (安胎飲 / 十三味, a compound product; decoction): 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.
2. Dang-Gui-Saho-Yao-San (當歸芍藥散, a compound product; powder): Angelicae Radix, Paeoniae Lactiflorae Radix, Hoelen, AlismatisRhizoma, Ligustici Rhizoma, and Atractylodis Rhizoma.

# 1985-1987 台北地區孕婦使用中草藥之盛行率及其相關因素

莊昭華<sup>1,2</sup> 賴榮年<sup>1,3</sup> 王榮德<sup>1,4</sup>  
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**目標：**孕婦使用草藥越趨流行，本研究的目的為探討台北地區孕婦使用中草藥之盛行率及其相關因素。**方法：**於1985-87年間到台北市立婦幼醫院進行產檢之懷孕26週或以上之孕婦，經由訪員使用結構式問卷進行訪談，以獲得詳細資料。利用複邏輯迴歸分析不同時期孕婦使用中草藥、西藥及鐵劑或維他命之相關因素。**結果：**6.9%的孕婦曾於孕前用過中草藥，42.3%於孕中使用過中草藥。家庭收入較低、未生產過、孕前有婦科病史、或孕前月經不規則之孕婦較易於孕前使用中草藥；較低教育、非專業性職業、曾有過流產或死產、或有B形肝炎之孕婦較易於孕中使用中草藥。**結論：**此1980年代的研究顯示台北地區孕婦普遍存在使用中草藥之情形，未來需繼續釐清草藥對胎兒之潛在健康影響，及孕期照護人員須詢問及注意孕婦使用中草藥之習慣。(台灣衛誌 2005；24(4)：335-347)

**關鍵詞：**中草藥、孕婦、盛行率、相關因素

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投稿日期：93年10月14日

接受日期：94年2月21日