

ORIGINAL REPORT

Use of herbal drugs during early pregnancy in relation to maternal characteristics and pregnancy outcome[†]

Lone Holst MSc Pharm^{1*}, Hedvig Nordeng PhD² and Svein Haavik PhD³

¹Department of Chemistry, Centre for Pharmacy, University of Bergen, Bergen, Norway

²School of Pharmacy, University of Oslo, Oslo, Norway

³Centre for Pharmacy, University of Bergen, Bergen, Norway

SUMMARY

Purpose To study characteristics of women using herbal drugs and the possible impact of use in early pregnancy on pregnancy outcome.

Methods Data on the use of herbal drugs during pregnancy were obtained from the Swedish Medical Birth Register during the period 1st July 1995 to end of 2004. Women who reported use of herbal drugs were compared to all women giving birth during the period. Outcome variables were prematurity, birth weight, Apgar score, number of infants in delivery and congenital malformations.

Results Among the 860 215 women in the register, 787 (0.9%) reported use of herbal drugs during early pregnancy. The most frequently used herbal drugs were Floradix[®] (iron-rich herbs), ginseng and valerian. Use of such drugs was independently associated with high maternal age, normal weight and 14–15 years of education. Risk factors for valerian differed from those for other herbal drugs, for example with respect to maternal smoking and country of birth. Concomitant drug use was common and the most frequently used drugs were multivitamins, folic acid, cardiovascular drugs (mainly antihypertensive drugs), non-steroid anti-inflammatory drugs (NSAIDs), analgesics and psycholeptics. None of the infant characteristics studied were influenced significantly by the mother's use of the examined herbal drugs during early pregnancy.

Conclusions The most commonly reported herbal drugs used during pregnancy were Floradix[®] (iron-rich herbs), ginseng and valerian. No signs of unfavourable effect on pregnancy outcome were seen. The number of exposures, however, was low and therefore effects on rare outcomes (e.g. specific malformations) cannot be excluded. Copyright © 2007 John Wiley & Sons, Ltd.

KEY WORDS — herbal drugs; pregnancy; maternal characteristics; pregnancy outcome

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INTRODUCTION

The use of herbal drugs is increasing in the western world.¹ Already in 1996, the *British Medical Journal*

published the news 'Complementary medicine is booming worldwide'.²

The use of herbal drugs during pregnancy has been studied to various extents in different countries. Results from studies conducted in Europe, USA or Australia indicated that between 7 and 56% of all pregnant women use herbal drugs.^{3–12} The wide range in prevalence may be explained by the use of different study methodologies, in addition to cultural and regional differences.³

* Correspondence to: L. Holst, Department of Chemistry, Centre for Pharmacy, University of Bergen, Allégaten 41, N-5007 Bergen, Norway. E-mail: lone.holst@farm.uib.no

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Only three previous studies have investigated maternal characteristics in relation to herbal drug use during pregnancy.^{3–5} In these studies, pregnant women who were of older age⁴ and had some higher education^{3–5} used herbal drugs more frequently.

No previous studies have investigated whether conventional drugs and herbal drugs are used concomitantly during pregnancy.

The only previous study describing the effect of herbal drugs on human pregnancy outcome was performed among 229 pregnant women in South Africa in 1997.¹³ Fifty-five per cent of the mothers studied, reported use of herbal drugs. The consequences described were high caesarean section rates (38.5%) and high frequency of meconium-stained liquor (55.6%). Adjustments for possible confounding factors, however, were not conducted in the statistical analysis.

The present study was undertaken in order to study characteristics of users of herbal drugs in early pregnancy and to study pregnancy outcome after such use. No ethical evaluation was necessary for this study.

MATERIALS AND METHODS

Study population and data collection

Data were obtained from the Swedish Medical Birth Register. The register collects data on antenatal care, pregnancy and outcome of birth from nearly all deliveries in Sweden.¹⁴ The data in the register are based on copies of the original medical records which are identical all over Sweden. Swedish women usually come to the antenatal clinic before they are 12 weeks pregnant. Antenatal care is free of charge and nearly all women attend this service. During the first visit, they are interviewed by a midwife. Among the many questions asked are about smoking habits and the use of drugs—prescription drugs, over the counter drugs and herbal drugs. Thus, the information recorded mainly refers to first trimester drug use. Drug names are recorded in clear text and are later recoded into therapeutic classes according to the Anatomical Therapeutic Chemical Classification System for drugs (ATC) elaborated by the WHO Collaborating Centre for Drug Statistics Methodology.¹⁵ As very few herbal drugs have such codes, the herbal drug names in the register remain mainly as clear text.

The present study includes all births registered in the Swedish Medical Birth Register between 1st July 1995 and 31st December 2004. Registration of data about maternal drug use began on 1st July 1994 and

the first children were thus born early in 1995, but by choosing 1st July 1995 as the start point of the study period it can be expected that information on drug use had been stored in the register for all women. The register was complete for 2004 at the time of study. In total, 860 215 women gave birth to 872 377 infants during the study period.

Data for maternal education as an indication for social level were obtained by linkage with the Central Register of Education (Statistics Sweden) but were only available for births up to and including 2001.

Additional data for congenital malformations were obtained from the Register of Congenital Malformations and from the Hospital Discharge Register.

The herbal drugs

Herbal drugs were identified from the list of products without ATC code. In addition, valerian products which have an ATC-code in Sweden were included.

Variables

The following descriptive variables were studied:

- Maternal age at pregnancy (<25, 25–34, ≥35 years).
- Maternal parity (a woman having her first infant is said to be parity 1, divided into parity 1, 2, 3 and 4 or more).
- Maternal smoking (unknown, none, <10 cigarettes per day, 10 or more cigarettes per day).
- Previous miscarriages (none, 1, 2, 3 or more).
- Subfertility (number of years the couple have tried for the woman to become pregnant, none, 1, 2, 3, 4, 5 or more).
- Mothers' country of birth (Sweden, other Nordic country, non-Nordic country).
- Maternal body mass index (BMI, <19.8, 19.8–25.9, 26.0–29.9, ≥30.0, ≥26.0). BMI data were only available for 728 352 (88%) pregnant women.
- Maternal education level (unknown, ≤9, 10–13, 14–15, ≥16 years). Education data were only available for the period up to and including year 2001. This period includes 563 578 (65.5%) pregnant women.

The following outcome variables were studied:

- Number of infants in pregnancy.
- Prematurity defined as born before 37th week. (Only singleton infants.)
- Low birth weight defined as less than 2500 g. (Only singleton infants.)

Table 1. Herbal drugs reported used by Swedish women during early pregnancy

Herb (s)	Number of women reporting use of the herb in pregnancy	Proportion (%) of users* taking the herb	Common indication for use
Floradix® Blutsaft (iron-rich herbs)	273	34.7	Iron supplementation
Ginseng (<i>Panax ginseng</i>)	151	19.2	Stimulant
Combinations (not echinacea)	133	16.9	Various
Valerian (<i>Valeriana officinalis</i>)	98	12.5	Insomnia, restlessness
Echinacea, combinations	81	10.3	Immune stimulant, cold
Echinacea, pure (<i>Echinacea purpurea</i>)	45	5.7	Immune stimulant, cold
St. Johns Wort (<i>Hypericum perforatum</i>)	14	1.8	Mild antidepressive
Ginger (<i>Zingiber officinalis</i>)	5	0.6	Morning sickness, nausea
Ginkgo (<i>Ginkgo biloba</i>)	4	0.5	Poor circulation, cognitive impairment
Garlic (<i>Allium sativum</i>)	4	0.5	Antihypertensive, anti-thrombotic
Other herbs	3	0.4	Various
Total	811**		

*787 women.

**Some women reported use of more than one herbal drug. Thus, the total equals more than 787.

- ‘Small for gestation age’ (SGA) defined as less than 2 standard deviations below expected weight.¹⁶ (Only singleton infants.)
- ‘Large for gestation age’ (LGA) defined as more than 2 standard deviations above expected weight.¹⁶ (Only singleton infants.)
- Low Apgar score (<7) at 5 min.
- Congenital malformations (relative severe malformations mean that infants with only the following malformation diagnoses are not counted as malformed: patent ductus arteriosus in a preterm infant, preauricular appendix, undescended testicle, unstable hip, tongue tie, single umbilical artery, nevus).

Statistics

Women who had used herbal drugs were compared to all women who had given birth during the study period with respect to maternal characteristics and concomitant drug use. Mantel–Haenszel procedure was used to estimate odds ratio (OR), and 95% confidence intervals (95%CI) were determined using Miettinen’s method.¹⁷ Adjustments for confounding factors were performed as described in the footnotes to the Tables 2 and 3. As valerian is an over-the-counter (OTC) drug in addition to being a herbal remedy, a separate analysis was conducted with respect to maternal characteristics and concomitant drug use.

To study the impact of herbal drug use on pregnancy outcome, infants of women who had used herbal drugs were compared to infants of all women who had given birth during the study period. Mantel–Haenszel procedure was used to estimate OR and 95%CI were

determined using Miettinen’s method.¹⁷ Adjustments for confounding factors were performed as described in the footnotes to the Table 4.

RESULTS

Herbal drugs used

Herbal drugs were reportedly used by 787 pregnant women (0.9%) giving birth to 800 infants. Among the women using herbal drugs, the number varied from one to three drugs. All together, 811 incidents of herbal drug use by the 787 women were reported.

The most used herbal drugs were Floradix® (iron-rich herbs), ginseng and valerian (Table 1). Floradix® was used by 34.7% of the women using herbal drugs, ginseng by 19.2% of the users and valerian by 12.5%. Only 0.6% reported the use of ginger during pregnancy.

Maternal characteristics

Table 2 shows maternal age, parity, smoking, previous miscarriages, education (as an indicator for social status), BMI, subfertility and country of birth for the women who used herbal drugs.

The use of herbal drugs was significantly higher among the pregnant women aged 35 or older compared to the 25–34 years old. Parity did not significantly influence the use of herbal drugs. Neither did smoking nor previous miscarriages. The uses were significantly higher among women with some higher education (14–15 years at school, bachelor degree) and significantly lower among women with 9 years or

Table 2. Characteristics of the pregnant, Swedish women using herbal drugs compared to all pregnant, Swedish women between 1st July 1995 and end of 2004

Characteristic	Users of herbal drugs	Population (all pregnant women)	OR*	Confidence interval (95%)
Total	787	860 215		
Age (years)**				
<25	69	140 079	0.36	0.28–1.46
25–34	517	576 134	1.00 ref.	
≥35	201	144 002	2.22	1.86–2.64
Parity (1 = first child)†				
1	349	373 859	1.09	0.94–1.27
≥2	438	486 356	1.00 ref.	
Smoking‡				
Unknown	18	55 958	—	
None	675	704 918	1.00 ref.	
<10	63	67 484	0.96	0.74–1.25
≥10	31	31 885	0.85	0.58–1.26
Any			0.93	0.74–1.16
Previous miscarriages§				
None	627	693 178	1.00 ref.	
1	118	128 484	0.99	0.80–1.22
2	30	27 865	1.24	0.83–1.83
≥3	12	10 688	1.23	0.67–2.28
Any			1.03	0.86–1.24
Maternal education				
Unknown	7	19 073	—	
≤9 years	45	67 662	0.69	0.50–0.96
10–13 years	310	298 970	1.00 ref.	
14–15 years	6	31 915	1.59	1.17–2.09
≥16 years	190	165 031	0.97	0.82–1.20
Maternal BMI¶				
Unknown	89	132 042	—	
<19.8	59	64 631	0.98	0.86–1.12
19.8–25.9	495	471 705	1.00 ref.	
26.0–29.9	81	120 764	0.64	0.51–0.81
≥30.0	47	71 252	0.66	0.49–0.89
≥26.0	128	192 016	0.64	0.53–0.78
Subfertility (number of years)¶				
0	726	803 037	1.00 ref.	
1	22	15 106	1.13	0.65–1.97
2	16	16 681	0.60	0.30–1.20
3	5	9160	0.65	0.27–1.58
4	6	5303	1.15	0.48–2.77
≥5	12	10 868	0.57	0.25–1.29
Any			0.79	0.56–1.10
Maternal country of birth¶				
Unknown	5	8335	—	
Sweden	676	702 711	1.00 ref.	
Other Nordic	20	20 654	0.93	0.60–1.46
Non-Nordic	72	128 515	0.63	0.50–0.80

*Odds ratio.

**Each age class compared with all other age classes and adjusted for year of pregnancy, parity, smoking and previous miscarriages.

†Each parity class compared with all other parity classes and adjusted for year of pregnancy, maternal age, smoking and previous miscarriages.

‡Odds ratio adjusted for year of pregnancy, maternal age, parity and previous miscarriages.

§Odds ratio adjusted for year of pregnancy, maternal age, parity and smoking.

||Up to and including 2001, $n = 555$. Odds ratio adjusted for year of pregnancy, maternal age and parity.

¶Odds ratio adjusted for year of pregnancy, maternal age, parity and smoking.

Table 3. Concomitant drug use among pregnant, Swedish women using herbal drugs

Concomitant drug		Number of women		OR*	95%CI
ATC	Group	In sample	In population		
A11A	Multivitamins	72	19 118	5.30	4.82–7.48
B03BB01	Folic acid	74	21 268	4.84	4.28–6.71
C	Cardio-vascular drugs	43	3934	10.9	8.53–14.0
J	Antibiotics	33	26 178	1.38	0.97–1.95
M01A	NSAID	29	13 734	2.20	1.53–3.17
N02 B	Minor analgesics	116	64 585	2.05	1.69–2.49
N05	Psycholeptics	22	5883	3.25	2.20–4.78
N06A	Antidepressants	35	8567	4.71	3.44–6.45
R01	Rhinitis drugs	12	11 047	1.13	0.64–2.00
R03	Anti asthmatics	22	25 451	0.96	0.63–1.46
R05	Cough medicines	11	4032	2.82	nd
R06	Antihistamines	45	46 357	1.11	0.82–1.50
	For NVP**	38	35 300	1.25	0.95–1.74

Only drugs with at least 10 exposures as concomitant drug are included in the table.

*OR adjusted for year of pregnancy, maternal age, parity and smoking, $n = 787$.

**NVP, nausea and vomiting in pregnancy.

less education. The group with more than 16 years of education (university level, master degree) did not use significantly more than the reference group (10–13 years at school). Women with a high BMI (more than 26) used significantly less herbal drugs than women with lower BMI.

Subfertility (measured as number of years) does not seem to influence the use of herbal drugs. Non-Nordic women used significantly less herbal drugs than Swedish women.

Ninety-eight users of valerian were registered. Some differences were seen with respect to maternal characteristics: more smokers than non-smokers reported the use of valerian (OR: 1.98 (1.20–3.27)) and more non-Nordic than Swedish/other Nordic mothers reported use of valerian (OR: 1.74 (1.06–2.86)).

Table 3 shows concomitant use of herbal drugs and other drugs. Drugs with 10 or more exposures as concomitant drug are included in the table.

The use of some drugs is overrepresented in the 'herbal user' group compared to the population. Those drugs are: multivitamins, folic acid, cardiovascular drugs (mainly antihypertensive drugs), non-steroid anti-inflammatory drugs (NSAIDs), analgesics, psycholeptics (antipsychotics, anxiolytics, hypnotics and sedatives) and antidepressants. Of the psycholeptics used concomitant with herbal drugs, more than 50% were used with valerian and of the 98 users of valerian, 12 used psycholeptics in addition (OR: 6.54 (4.22–10.13)).

Infant characteristics

Table 4 shows characteristics of the infants born of the mothers studied.

None of the studied outcome variables were influenced significantly by the mother's use of the examined herbal drugs.

All together, 42 cases of malformations were registered among the infants born. The mother's use of the examined herbal drugs was not significantly associated with any negative effects for the infant.

Table 5 lists the observed relatively severe malformations. It can be noted that three severe eye malformations occurred even though they differ in nature. Two cases of craniostenosis are also noticeable. Both observations can obviously be random.

DISCUSSION

The use of herbal drugs detected in the Swedish Medical Birth Register is low compared to findings in smaller studies.^{3–5} This is probably mainly due to two facts. Firstly, the Swedish data refer to first trimester use while most published studies refer to use any time during pregnancy. Secondly, it is not known how detailed the mothers are asked about their use of herbal drugs and as the interviews are performed by many different midwives they may be performed in different ways. In studies specifically designed to determine the prevalence of herbal drug use, questions are asked about specific herbal products or posters with products

Table 4. Characteristics of the infants born by the Swedish mothers using herbal drugs

Characteristic	Mothers using herbal drugs	Population (all mothers)	OR*	95%CI
Number of deliveries				
Singleton	777	844 635	1.00 ref	
Twin**	10	13 377	0.75	0.40–1.42
Multiple	1	205		
Prematurity†				
Premature	29	43 069	0.74	0.52–1.07
Total population	763	845 722	1.00 ref	
Low birth weight‡				
LBW	17	27 429	0.69	0.43–1.12
Total population	755	842 343	1.00 ref	
Small for gestational age§				
SGA	14	18 262	0.80	0.46–1.38
Total population	755	841 404	1.00 ref	
Large for gestational age§				
LGA	56	52 064	1.24	0.94–1.63
Total population	755	841 404	1.00 ref	
Low Apgar score at 5 min				
<7	9	13 595	0.72	0.37–1.39
≥7	772	853 030	1.00 ref	
Congenital malformations				
Total	781	873 876		
Any malformation	42	38 892	1.12	0.82–1.54
Rel. severe malformation¶	32	27 299	1.17	0.82–1.67
Cong. Heart defect	15	10 359	1.43	0.85–2.39
Population			1.00 ref	

*Odds ratio.

**Odds ratio for twin births adjusted for year of pregnancy, maternal age, parity and smoking.

†Only singletons with known duration of pregnancy. Odds ratio adjusted for year of pregnancy, maternal age, parity and smoking.

‡Only singletons with known birth weight. Odds ratio adjusted for year of pregnancy, maternal age, parity and smoking.

§Only singletons with known gestational duration, birth weight and sex. Reference graphs from Källén.¹⁵

||Odds ratio adjusted for year of pregnancy, maternal age, parity smoking and BMI.

¶Rel. severe malformations means that infants with only the following malformation diagnoses are not counted as malformed: patent ductus arteriosus in a preterm infant, preauricular appendix, undescended testicle, unstable hip, tongue tie, single umbilical artery, nevus.

are shown in order to illustrate what is meant by 'herbal drugs'. It is thus reasonable to assume that the reported use of herbal drugs by 0.9% of Swedish pregnant women is lower than the actual number and cannot be used for an estimate of the prevalence of herbal drug use. More than 60% of Americans using alternative treatments did not report this to their doctor.¹⁸ There is no reason to believe that this should be different for pregnant women.

Incomplete registration will cause that some women who have used herbal drugs will be regarded as unexposed. This will bias the associations and risk estimates towards the value of one, thus reducing the potential for identifying an existing association.¹⁹ It should however be noted that the large number of women included in this study, more than 800 000, results in an increased statistical power; this offsets and usually outweighs that bias.

The interviews are performed before the outcome of the pregnancy is known and recall bias caused by outcome is thus not possible. From this point of view, exposure information is prospective in relation to outcome. It is therefore very unlikely that ascertainment will be dependent on outcome, which is easily the case in retrospective studies.

Previous studies are smaller, up to 1200 pregnancies,⁷ and have other methodological limitations as retrospective design,³ low response rates¹⁰ and study populations not representative for the general pregnant population.¹¹

The most frequently used product, Floradix[®], contains vitamins, herbal extracts and fruit concentrates. The iron content is 7.5 mg per 10 ml and is said to be in the absorbable form of a yeast extract. It is sold with a recommendation stating 'Floradix[®] is especially suitable for women (including expectant and

Table 5. Relatively severe malformations observed among infants born of Swedish mothers using herbal drugs during pregnancy

Micropthalmia and large artery malformation	1
Congenital glaucoma and cleft lip/palate	1
Congenital cataract and duplication of ureter	1
Ventricular septum defect	3
Ventricular septum defect and renal dysplasia	1
Ventricular septum defect, low-set ears and unspec. endocrine malformations	1
Atrium septum defect and hydronephrosis	1
Atrium septum defect and pes equinovarus	1
Endocardial cushion defect and tricuspidal malformation	1
Anal atresia with spine malformation, penis malformation, atrium- and ventricular septum defect, hydronephrosis	1
Unspecified cardiac malformation	2
Ectopia anus	1
Hydronephrosis and dextrocardia	1
Hydronephrosis and choledochus cyst	1
Hypospadias	2
Craniosostenosis	2
Neurofibromatosis and polydactyly	1
Tuberous sclerosis	1
Unspecified syndrome	1
Down syndrome	2

nursing mothers), men, growing children and persons whose diet is lacking in natural iron and vitamins'. The recommended daily dose is 20 ml and is said to equal the Recommended Daily Allowance (RDA) of iron. Iron-rich herbs are considered to be safe in pregnancy when used in recommended doses.³ The use of this product is described in only one other study and by only 12% of the users.³ That is 1/3 of the amount of users in this study.

Ginseng is found in many different formulations and doses. No information is available about the doses taken. The safety of ginseng during pregnancy has not been established in humans and it is recommended to avoid the herb.^{20–22} A study of the teratogenic effect of ginsenoside Rb₁ (one of the active constituents in ginseng products) on rat embryos demonstrates a direct teratogenic effect and supports the avoidance of the herb in pregnant women.²³ The use of ginseng is high (19%) compared to other studies (1–10%).^{3,5–7,9,12}

Two reviews^{24,25} conclude that valerian may improve sleep quality, but methodologic flaws of the included studies limit the value of conclusions. Information about safety of valerian in pregnancy is insufficient. Four studies report no increased risk to the fetus.²⁶ The use of valerian is also reported in other studies. Between 2.7 and 7.5% users are described^{7,8,12} compared to 13% in this study.

Ginger is commonly used against nausea during pregnancy in other countries. In a Norwegian study, 10% of the women using herbal drugs during pregnancy used ginger³ and other studies show between 2 and 33% users^{4–12} compared to 0.6% in this study. One explanation for the very low percentage can be that Swedish women are using OTC antihistamines against nausea during pregnancy (4.1% of the total population report use of antihistamines against nausea and vomiting in pregnancy (NVP)).

The characteristics of women reporting the use of herbal drugs are in agreement with the results of other studies. They tend to be older,^{4,7,9} have some degree of higher education^{4,5,9} and be non-smokers.⁴

The users of valerian differ from the general description of users given above in three ways: significantly more smokers than non-smokers use valerian, significantly more non-Nordic than Nordic women use valerian and significantly more valerian-users than users of other herbs report concomitant use of psycholeptics. It is known from another study²⁷ that pregnant women who smoke also use more benzodiazepines than non-smokers. In this study, valerian does not substitute psycholeptics, but in 12% of the cases comes in addition to this use. The reasons for and consequences of such concomitant use warrant further investigation. It is possible that women perceive valerian to be safer, and use this herb to be able to use less psycholeptics.

Women who were born outside the Nordic countries used significantly less herbal drugs on the whole, but significantly more valerian preparations during pregnancy. This may be due to difference in tradition in herbal drug use. It is thus important for health care professionals to be aware of possible cultural differences with respect to herbal drug use during pregnancy.

Multivitamins and folic acid are used to a high extent by users of herbal drugs. A probable explanation for this is that these women are more conscious about health and use both multivitamins, folic acid and herbal drugs because they consider them to be healthy and safe. One study found that 57% of 400 pregnant women expressed that herbal drugs could be used by pregnant women and that 41% believed that pregnant women should prefer herbal drugs to other drugs.²⁸

The overrepresentation of users of cardiovascular drugs among users of herbal drugs can possibly be explained by confounding by indication or reporting bias. Women with cardiovascular illnesses may more often be recommended or use on their own initiative

KEY POINTS

- Use of the examined herbal drugs during pregnancy had no impact on infant characteristics.
- Concomitant use of conventional drugs and herbal drugs is common.
- Health personnel in antenatal care should be encouraged to ask pregnant mothers about their use of herbals during the whole pregnancy.

iron-rich herbal drugs as Floradix. Also, users of prescription medicines might more easily remember and report their use of herbal drugs compared to women not using any conventional drugs.

An explanation for the overrepresentation of users of NSAIDs, minor analgesics, psycholeptics and antidepressants among users of herbal drugs may be that the women using drugs are more willing to treat a disease or bother with medicines and therefore are more prone to try herbal drugs as well when they hear about them.

Pregnant women who use conventional drugs may put themselves at an extra risk when using herbal drugs because of potential interaction problems. Several interactions have been described between herbal drugs and antidepressants or psycholeptics.²⁹ Valerian, for example may potentiate the effect of CNS drugs, and increase the risk of adverse effects.²⁰

When it comes to consequences for the newborn, none of the factors studied were influenced significantly by the mother's use of the examined herbal drugs.

As far as we know, nobody has so far studied the consequences of herbal drug use on pregnancy outcome in such a large population. Most studies are performed retrospectively during antenatal care and the results are not coupled to pregnancy outcome.

CONCLUSION

Herbal drug use reported during early pregnancy was low. The most commonly used herbal drugs among pregnant women in Sweden are Floradix[®] (iron-rich herbs), ginseng and valerian.

The women with the highest risk of using herbal drugs during pregnancy are 35 years or older, born in Sweden or in another Nordic country, have a bachelor's degree or equal level of education and normal weight. Users of cardiovascular drugs,

psycholeptics and antidepressants are overrepresented among the users of herbal drugs.

Maternal use of the examined herbal drugs does not affect the studied infant characteristics: prematurity, low birth weight, small for gestational age, large for gestational age, low Apgar score at 5 min or congenital malformations. The number of exposures, however, was low and therefore effects on rare outcomes (e.g. specific malformations) cannot be excluded.

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