



## ***Letter to the editor***

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### **Menstrual disorders among dry-cleaning workers.**

by [Zielhuis GA](#), [Gijsen R](#), [van der Gulden JW](#)

**Affiliation:** Department of Epidemiology, University of Nijmegen, The Netherlands.

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### Menstrual disorders among dry-cleaning workers

Since the early paper by Hemminki et al in 1980 (1), dry-cleaning work has been suspected of being associated with reproductive disorders in women of child-bearing age. As perchloroethylene (also called tetrachloroethylene) is the predominant chemical agent used in this industry, it is considered to be a potential reproductive toxicant. Since 1980, several epidemiologic studies have been performed that have focused on the possible connection between dry-cleaning work and spontaneous abortions, subfertility, and congenital defects (2).

In light of the assumption that perchloroethylene affects the central nervous system and therefore might also influence the hormonal balance of the hypothalamus-pituitary-ovarium axis, we performed a small-scale exploratory study on the association between dry-cleaning work and menstrual disorders. In this study, we mailed a self-administered questionnaire to 592 women who did either dry cleaning or laundry work. A total of 471 (80 %) women responded. The questionnaires of 72 women could not be used because of current pregnancy, lactation, chronic illness, or gynecological surgery. Of the remaining 399 questionnaires, 193 came from women exposed to perchloroethylene and 206 from unexposed women. With respect

to age, life-style, work conditions, and personal characteristics (such as Quetelet index and number of children), both groups were very similar. Because two-thirds of both groups used oral contraceptives, only 68 (exposed) and 76 (reference) questionnaires could be used in the analysis.

In summary, it was found that the mean cycle length for dry-cleaning and laundry workers was about equal (28.8 and 28.2 d, respectively). The accuracy with which the women were able to predict their periods was also almost identical (2.8 and 2.7 d, respectively). With respect to the disorders listed in table 1, the null value of no excess risk was not included in the 90 % confidence interval regarding the risk of dysmenorrhea, unusual cycle length, menorrhagia, and the premenstrual syndrome. It should be noted that the occurrence of virtually all menstrual disorders in exposed women was higher than in the reference group. These findings support the hypothesis that perchloroethylene affects the hormone system, but they do not have any real practical consequences because of the limitations of this investigation (small size, no exposure measurements). However, the results do stress the need for further study.

**Table 1.** Risk for menstrual disorders among female dry-cleaning workers relative to female laundry workers. Women using oral contraceptives have not been included. (90 % CI = 90 % confidence interval)

Menstrual disorder	Prevalence in reference group (%)	Odds ratio <sup>a</sup>	90 % CI
Amenorrhea	0	.	.
Oligomenorrhea	10	2.1	0.9–5.3
Polymenorrhea	17	0.8	0.4–1.7
Irregular cycle	38	1.2	0.7–2.2
Unusual cycle length	30	2.3	1.2–4.4
Intermenstrual blood loss	17	1.3	0.6–2.7
Menorrhagia	22	3.0	1.6–5.6
Dysmenorrhea	29	1.9	1.1–3.5
Premenstrual syndrome	10	3.6	1.5–8.6

<sup>a</sup> Corrected for confounding by means of a linear logistic regression model with the probability of disease as the dependent variable. Factors considered as confounders were age, Quetelet index, substantive weight changes, number of children, history of diseases, sporting activities, life events, smoking, alcohol consumption, medical drugs, and work conditions other than exposure to perchloroethylene.

### References

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Gerhard A Zielhuis, PhD, MSc, Ronald Gijsen, MSc, Joost WJ van der Gulden, MD  
 Departments of Epidemiology and Occupational Health  
 University of Nijmegen  
 Nijmegen  
 The Netherlands

(Address correspondence to : Dr GA Zielhuis, Department of Epidemiology, Institute of Social Medicine, Verlengde Groenestraat 75, 6525 EJ Nijmegen, The Netherlands)