

## Continually Exposure To The Inhalational Anaesthetic Agents And Their Harmful Effects on Pregnancy

O. ŞENGÖNÜL M. D.<sup>a</sup>, M. KARAMEHMETOĞLU M. D.<sup>b</sup>, G. AKYÖN M. D.<sup>c</sup>  
G. ARSLAN M. D.<sup>d</sup>, S. ÖZGEN M. D.<sup>e</sup>

<sup>a</sup> Profesör in Anaesthesiology and Reanimation.

Trakya University Faculty of Medicine, Anaesthesiology and Reanimation Dept. — EDİRNE

<sup>b</sup> Profesör in Anaesthesiology and Reanimation Dept.

Hacettepe University Faculty of Medicine — ANKARA

<sup>c</sup> Profesör in Anaesthesiology and Reanimation Dept. — Çukurova University ADANA

### SUMMARY :

The effects of the anaesthetic gases on pregnant women have been investigated on 21 anaesthesiologists and 10 operating theatre nurses. In our personal communications with anaesthesiologists, operating theatre nurses and personnels in the operating theatre between 1978 — 1982, we found out 9 spontaneous abortion and 7 spontaneous vaginal bleeding among 21 pregnant anaesthesiologists. 2 spontaneous abortion and 3 spontaneous vaginal bleeding among 10 pregnant theatre nurses. The literature data are parallel with our investigation results. As a result, the rate of spontaneous abortions among the anaesthesiologists and nurses working in operating rooms who had continuous exposure to the anaesthetic gases, is higher than those who are not working in operating theatres.

### INTRODUCTION

Application of drugs against to the internal and external harmful factors may brought undesirable side effects beside their life saving actions. Anaesthetic inhalational agents are one of these drugs. Continuous exposure to the inhalational anaesthetic agents may effects the patients from different aspects, and cause appearance of many different diseases.

In this article we struggle to reveal the effects of these agents only on the pregnancies and abortions.

Continuous exposure of the anaesthesiologists and operating theatre personnels to the inhalational anaesthetic agents and its sequence has been revealed by many authors<sup>1, 11, 9</sup>.

## **CONTINUALLY EXPOSURE TO THE INHALATIONAL ANAESTHETIC AGENTS AND THEIR HARMFUL EFFECTS ON PREGNANCY**

Also it has been shown that the 60 % of pregnancies among anaesthesiologists and operating room personnels are followed by abortions, premature babies and stillborns<sup>1, 11</sup>.

The U.S.A Association Centre of Anaesthesiologists has investigated the side effects of the inhalational anaesthetic gases on the theatre personnels and anaesthesiologists. Similar investigations have been done in Russia, Denmark and United Kingdom.

Those authors are asserted that the ratio of abortions are increased among the women who have close relation with anesthetic agents. This view is demonstrated and supported by animal experiments<sup>1</sup>.

Vaisman<sup>12</sup> in Russia (1967), noticed 18 spontaneous abortion, 2 premature babies and 1 congenital malformation among 31 pregnant anaesthesiologists.

Askrog and Herval<sup>4</sup> (1970), in their studies in Denmark noticed that the ratio of abortions is too high (20 %).

Cohen and colleagues<sup>6</sup> (1971), found out that spontaneous abortions are 10 % in control group, 30 % in operating rooms personnels and 38 % among the anaesthesiologists.

The actions of the inhalational anaesthetic agents on foetus were experimentally studied in pregnant animals. It has been observed that halothane reduces the chance of ovulations and implantations. Also beside its action on decreasing the growth of foetus, it has not any major teratogenic effects<sup>6</sup>.

On 563 anaesthesiologists and operating theatre personnels, Knill - Jones and colleagues<sup>10</sup> (1972), showed that the rate of abortions is too high (18.2%), among anaesthesiologists than those who are working in operating rooms<sup>3, 5</sup>.

On the studies of Corbett and his colleagues<sup>8, 9</sup> (1973), on 621 anaesthetic nurses, it has been found that the spontaneous abortions among the anaesthetic nurses are 3 folds, and the congenital anomalies and birth defects are more than other nurses who have not any contact with anaesthetic agents.

Basford A.B., Fink B.R.<sup>3</sup>, showed in their experimental animal studies, that high concentration of the inhalational anaesthetic agents, has teratogenic effects beside their embryotoxic actions.

In our personal communications with anaesthesiologists, operating theatre nurses and personnels in our operating theatre between 1978 - 1982, we found out 9 spontaneous abortion and 7 spontaneous vaginal bleeding among 21 pregnant anaesthesiologists. 2 spontaneous abortion and 3 spontaneous vaginal bleeding among 10 pregnant theatre nurses.

## DISCUSSION

The certainty of the effects of the inhalational anaesthetic agents on abortions are not clear, but according to some authors, the side effects are due to the high concentrations of the agents<sup>3</sup>.

Van Dyke and Chenoweth M.B.<sup>14</sup>, claimed that the complications in pregnancy are caused by the metabolic products of the inhalational anaesthetic agents.

Stier and colleagues<sup>12</sup>, found metabolic products of halothane in the urine after 20 days of anaesthesia.

Corbett and ball<sup>7</sup>, observed methoxyflurane in the urine after 20 days, and nitrous oxide gases after 56 hours of anaesthesia. The same authors, in their paper state that they noticed halothane after 64 hours, methoxyflurane after 29 hours and nitrous oxide gases after 7 hours in the anaesthesiologists urine, due to prolonged exposure to these gases<sup>7</sup>.

However, there is no evidence that the low concentrations of the anaesthetic gases cause any harm neither on pregnancies nor on abortions<sup>4</sup>. But Chenoweth and his colleagues observed histological variations and hepatomegaly in the liver of the mouse after continuous exposure to the low concentration of methoxyflurane and of halothane<sup>5</sup>.

Continuous exposure to the low concentration of the inhalational anaesthetic gases, increase the risk of abortions among the operating room nurses<sup>1, 11</sup>.

## RESULT

After all those studies and investigations made up-to-date, it is not easy to say that the inhalational anaesthetic agents are definitely embryotoxic, neoplastic, or causes of the birth defects and abortions on the pregnant. But it is worth to continue further investigations over a wide and great quantity of populations to get the final and definite academical results.

## REFERENCES:

1. American Society of Anaesthesiologists. "Occupational Disease among operating room personnel". A national study. Report of an Ad Hoc Committee on the effect of trace Anaesthetics on the health of the operating room personnel. *Anaesthesiology*, 41 (4): 321—339. 1974.
2. Askrog V., Hervald B.: Teratogen effect of inhalation anaesthetics. *Saertyk Nord Med.* 3: 490, 1970.

**CONTINUALLY EXPOSURE TO THE INHALATIONAL ANAESTHETIC AGENTS AND THEIR HARMFUL EFFECTS ON PREGNANCY**

3. **Basford A. B., Fink B. R. :** "The Teratogenicity of halothane in the rat". *Anaesthesiology*. 29 : 1167., 1968.
4. **Cascorbi H. F., Blake D. A., Helrich M. :** "Differences in the biotransformation of halothane in man". *Anaesthesiology*, 32 : 119., 1970.
5. **Chenoweth M. B., Leong B. K.J. :** "Toxicities of methoxyflurane, halothane and diethyl ether in laboratory animals on repeated inhalation at sub anaesthetic concentration, cellular biology and toxicity of anaesthetics". Edited by B. R. Fink, Baltimore, William and Wilkin, 1972, page : 275 — 285.
6. **Cohen E. N., Bellville J. W., Brofn B. V., :** "Anaesthesia, pregnancy and miscarriage : A study of operating room nurses and anaesthetists". *Anaesthesiology*, 35 : 343., 1971.
7. **Corbet T. H., Ball G. L., :** "Chronic exposure to methoxyflurane : A possible occupational hazard to Anaesthesiologists" *Anaesthesiology*, 34 : 532, . 1971.
8. **Corbett T. H., Cornell R. G. :** Incidence of cancer among Michigan nurs anaesthesiology. 58 : 260, 1973.
9. **Corbett T. H., :** Richard, G. Corbett, Judy L. Enders, Keith Leiding, "Birth of defects among children of nurs anaesthetists". *Anaesthesiology*. 41 (4) : 341 — 344. 1974.
10. **Knill-Jones R. P., Moir D. B., Rodrigues L. V., :** Anaesthetic practice and pregnancy : A controlled survey of women anaesthetists in the united kingdom. "Lancet", 2 : 1326, 1972.
11. **Leonard F. Walts, Alan B. Forth, George Moore :** "Occupational disease among operating room personnel " *Anaesthesiology*. 42 : 608., 1975.
12. **Stier A, Alter H., Hessler O., O., :** "Urinary excretion of bromide in halothane anaesthesia". *Anesth. Analg. (Cleve)*. 43 : 723., 1964.
13. **Vaisman Al** "Working condition in surgery and their effect on the health of Anaesthesiologists". *Eksp Khir Anaestheziol*. 3 : 44 — 49, 1967.
14. **Von Dyke, Chenoweth M. B., :** "Metabolisme of volatic anaesthetics". *Anaesthesiology*. 26 : 348., 1965.