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## RISK ASSESSMENT IN NURSES OCCUPATIONALLY EXPOSED TO ANTINEOPLASTIC DRUGS

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**Key words:** cyclophosphamide, occupational exposure, biological monitoring

**Introduction:** Cytostatic antineoplastic drugs are known as carcinogenic, mutagenic and teratogenic risk factors for health care workers who are occupationally exposed during the preparation and administration of such drugs.

**Objectives:** The purpose of the present study was to evaluate the occupational exposure and biological monitoring of the personnel handling antineoplastic agents.

**Material and methods:** Forty two subjects, all women, nonsmokers, with the mean age 33 years and the duration of the exposure to the cyclophosphamide (CP), ranging from 1 to 27 years were investigated. Twenty two subjects, all women, nonsmokers, with the age ranging from 21 to 57 years, without exposure to antineoplastic drugs were included in the control group. The level of contamination by antineoplastic agents in drug preparation and administration areas in cancer treatment hospital X in Romania was determined by the analysis of the air samples, wipe samples and gloves. High volume samples were used to detect cyclophosphamide (CP) in the environment of the nurses who were involved in preparing antineoplastic agents. CP was detected with gas chromatography in tandem with mass spectrometry.

**Results and discussion:** Release of the CP was discovered in 3 drugs – preparation sites. Five from 25 air samples were positive for CP, CP concentration ranging from 7 to 73.2 ng/mc. Two out of 15 pair of gloves, used during preparation of the drugs were contaminated with CP, CP concentration being 21 and 130 µg/pair of gloves, respectively). The floors in the administration rooms were contaminated with CP. Three from 15 samples were positive (medium: 5.5 µg/cmp). In personal air samples, the CP concentration ranged up to 10.4 µg/mc. Excretion of the CP in urine in nurses exposed to CP, who were involved in the preparation of CP during 10 week period was detected. The mean excretion of CP was 0.47 µg/day (range: 0.38–25.5 µg/l urine. Urinary thioethers excretion in nurses handling cytotoxic drugs was increased in comparison with the control group (16.7 mmol/mol creatinine versus to 6.3 mmol/mol creatinine).

**Conclusions:** Environmental monitoring and biological monitoring have been used to measure environmental exposure and uptake, respectively. To further eliminate occupational exposure to cytostatic drugs introduction of the special protective measures and safety guidelines are needed.