

Evaluation of occupational exposure to antineoplastic drugs in pharmacy and oncology department

E. Korczowska¹, H. Jankowiak-Gracz^{1,3}, P. J.M. Sessink², E.Grześkowiak³



¹ Clinical Hospital of Lord's Transfiguration, University of Medical Sciences in Poznan, Poland, ² Exposure Control Sweden AB, Bohus-Björkö, Sweden
³ Poznan University of Medical Sciences, Department of Clinical Pharmacy and Biopharmacy, Poznan, Poland.

INTRODUCTION

Several studies have shown evidence on adverse health effects associated with exposure to antineoplastic drugs. Hospital personnel involved in preparation and administration of antineoplastic drugs may be at risk if exposed to these hazardous pharmaceuticals.

OBJECTIVES

The purpose of the study was to evaluate the potential exposure to antineoplastic drugs in pharmacy and oncology department in Polish hospital under normal working conditions. The exposure was measured by determination of cyclophosphamide (CP) in urine of pharmacists, physicians and nurses.

MATERIAL AND METHODS

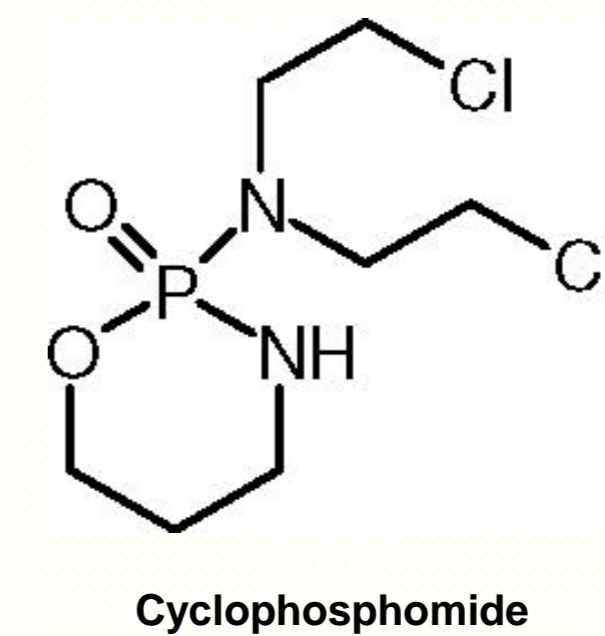
Eight hospital workers were included in the study. Urine samples collected from 2 pharmacists, 2 physicians and 4 nurses. One pharmacist prepared antineoplastic drugs while the other pharmacist assisted. All four nurses in the oncology department were engaged in administration of the drugs. The two physicians did not handle the drugs but they had only contact with treated patients. Total 24h urine was collected in fractions and from each fraction the volume was registered and used to calculate the total amount of CP excreted over the 24hr period. Samples were collected with Cyto Urine Kits from Exposure Control Sweden AB. Samples were stored frozen until analysis with GC-MSMS.

RESULTS AND DISCUSSION

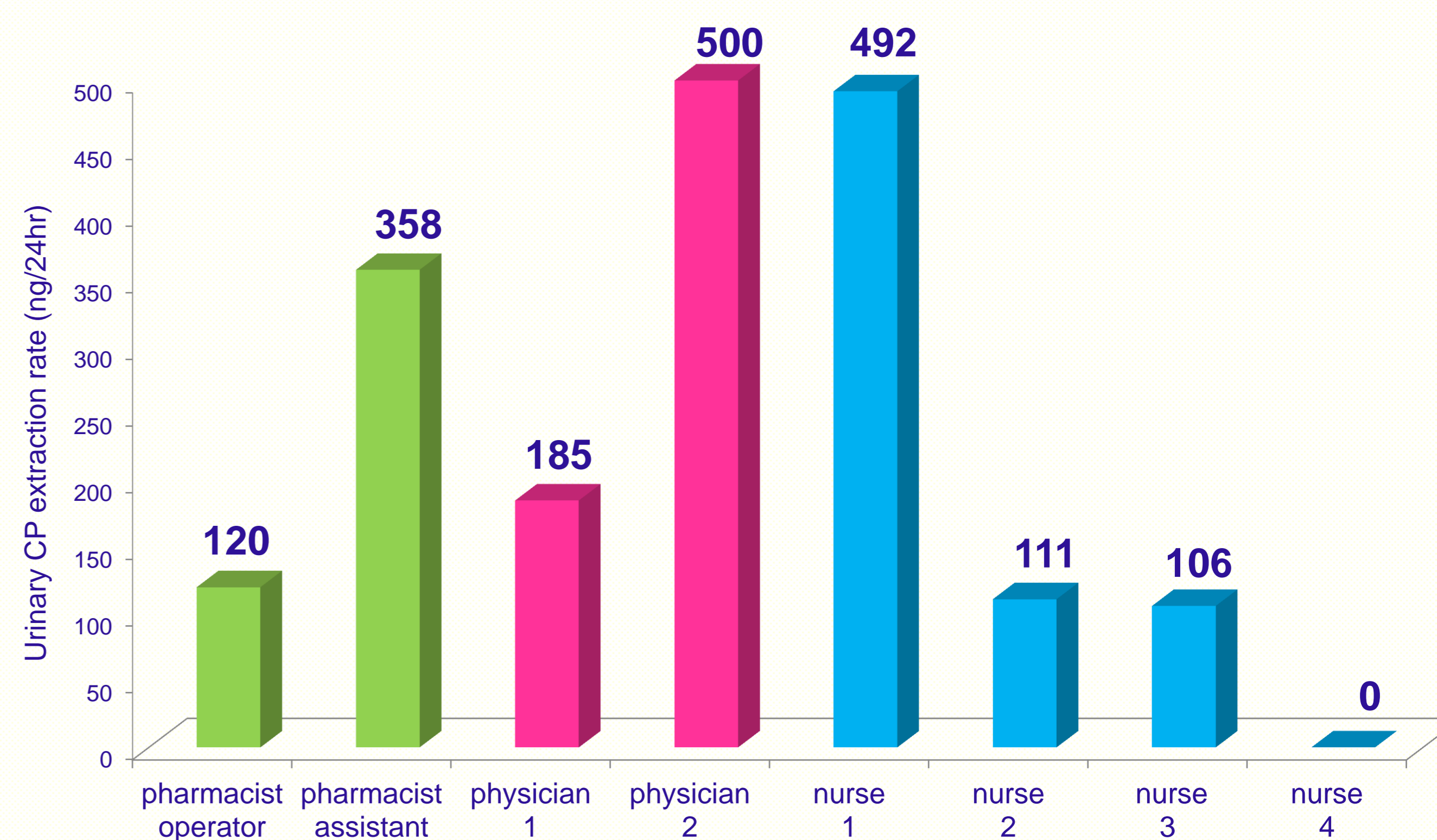
Over the 24hr periods, 62 urine samples from 8 hospital workers were collected. CP was detected in 31 urine samples (50%) concerning all pharmacists, all physicians and 3 nurses. The total amount of CP excreted per worker ranged from 106 to 500 ng/24hr. The mean amount of CP excreted per worker on group basis was 234 ng/24hr (physicians: 343 ng/24hr, pharmacists: 239 ng/24hr, nurses: 177 ng/24hr). The highest amount of CP excreted was found for one physician (500 ng/24hr) and for one nurse (492 ng/24hr). The amount of CP excreted in urine from the pharmacist who assisted in preparation (358 ng/24hr) was higher than from the pharmacist who prepared the chemotherapy infusions (120 ng/24hr). CP was not detected in the urine samples of one nurse indicating no measurable exposure to CP.

CONCLUSION

The results show that almost all hospital workers were exposed to CP. In addition, the study demonstrates the highest exposure of personnel not directly involved in the preparation and administration of antineoplastic drugs. Clearly, more research is needed, but this is sufficient evidence that also nurses and physicians being involved in the area of cytotoxic administration on the ward can be exposed to these hazardous drugs.



The total amount of CP excreted per worker



The mean amount of CP excreted per worker on group basis

