Response to "Secondary Exposure of Family Members to Cyclophosphamide After Chemotherapy of Outpatients With Cancer: A Pilot Study"

Near panic around secondary exposure of staff and family members to chemotherapy products is being seen again in spite of the implementation of products and procedures that have been shown to decrease the incidence in these populations (Sessink, Trahan, & Coyne, 2013). Many erroneous statements surrounding the extent of inadvertent chemotherapy exposure can be found in patient education sheets, in American Cancer Society publications, and, of course, on the Internet.

Therefore, it was with a sense of relief at finally finding a voice of reason that I turned to "Secondary Exposure of Family Members to Cyclophosphamide After Chemotherapy of Outpatients With Cancer: A Pilot Study" (Yuki, Ishida, & Sekine, 2015).

However, I was sadly disappointed for the following reasons.

The graphs showing patient and family member case studies were illustrated with two different y-axis scales. Apparently, this is acceptable among statisticians, but because most RNs are not statisticians, graphing the results in this fashion appeared to demonstrate that family members, at times, excrete more chemotherapy than patients.

Unless one reads carefully, it is not readily apparent that patients' excretion is measured in milligrams (mg) and family members' are measured in nanograms (ng). One mg equals 1 million ng. If these numbers were graphed to scale, the ng would be barely visible. An example of the disparity is that if an ng is 1 cup of water, an mg would be 62,500 gallons.

The article also made broad, unsupported statements: "Although these family members did not receive chemotherapy, CPA was detected in their urine samples . . . indicating secondary exposure from environmental surface contamination at home" (p. 669), "both family members were exposed to the drug" (p. 668), and "family members may be exposed to high doses of antineoplastic drugs" (at home, after chemotherapy) (p. 670).

These statements are made without addressing many variables:

- How many of the tested family members were present in the infusion suite during treatment? Did they accompany anyone else to any other chemotherapy treatment?
- Does the institution where the patients were treated use closed-system drug administration sets?
- What is the profile of CPA excretion seen in the RNs who administer chemotherapy in this setting, and in the pharmacy personnel who prepare it? How does this compare to the family members?
- What are the hygiene habits of the patients and family members at home? Because drug residue was found on all areas of the bathroom (including the floor and doorknobs), are the residents routinely touching bodily fluids and surfaces and not washing their hands?

Pilot studies are used to ensure that the ideas or methods behind a research idea are sound, and this study certainly raised many questions about data collection and reporting.

References

Sessink, P.J., Trahan, J., & Coyne, J.W. (2013). Reduction in surface contamination with cyclophosphamide in 30 U.S. hospital pharmacies following implementation of a closed-system drug transfer device. *Hospital Pharmacy, 48,* 204–212.

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Karen O'Driscoll, RN, OCN®, is a clinical RN at Huntsman Cancer Institute at the University of Utah in Salt Lake City. O'Driscoll can be reached at karen.odriscoll@hci.utah.edu, with copy to editor at ONFEditor@ons.org.

The Author Responds

The participants of this study were not accompanied by a family member or anyone else while receiving treatment on an outpatient basis. The hospital involved in the study used a closed system of drug administration. We did not investigate the association between this system of drug administration and the drug exposure of family members in the home because the survey used urine samples collected by the participants after they returned home from chemotherapy. In addition, CPA excretion measurement for hospital nurses and pharmacists was not one of the objectives of this study and, therefore, was not analyzed.

With regard to the hygiene habits of patients after they returned home and those of their family members, they behaved as they normally did in their daily lives. However, we provided disposable gloves and instructed patients and their family members to use a new pair each time a urine sample was collected.

The objectives of this study were to ascertain whether family

members and people who lived with patients were exposed to the still active anticancer drugs that were excreted by the patients who received outpatient treatment when at home and to investigate the measures designed to reduce the risk of exposure in cases in which they were exposed. Data on these issues have remained insufficient; therefore, we designated this study as a pilot study because it was important to ascertain the situation in patients' homes.

In contrast to hospitalized patients, outpatients have a wide variety of home environments. In the future, we believe that a survey must be conducted on the prevention of exposure to anticancer drugs, using the educational content regarding anticancer drug exposure provided to patients and their family members by nurses and pharmacists involved in the treatment and the conditions in which this education should be provided as variables.

Michiko Yuki, RN, PhD, is a professor in Health Sciences at Hokkaido University in Sapporo, Japan. Yuki can be reached at yuimck@hs.hokudai.ac.jp, with copy to editor at ONFEditor@ons.org.

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