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Postchemotherapy Confusion

The purpose of the "Clinical Challenges" feature is to provide readers with a forum to discuss creative clinical solutions to challenging patient care problems. The goal is to blend the past "Practice Corner" and "Case in Point" features in a case study or "nursing tumor board" format. A challenging patient problem will be presented followed by a discussion of possible clinical interventions and solutions. A "Clinical Highlights" box will provide research-based information on the problem to support evidence-based practice. Interdisciplinary responses will be included as appropriate.

Contributions to the "Clinical Challenges" feature are welcome. Descriptions may be submitted with or without discussion or solutions. References, tables, figures, or illustrations can be included. Ideas for case studies also are welcome. Materials or inquiries can be sent as an e-mail attachment to Nancy Jo Bush, RN, MN, MA, AOCN®, *ONF* associate editor, at njbush@sonnet.ucla.edu.

Ms. M is a 31-year-old female with metastatic osteogenic sarcoma. She has received multiple chemotherapeutic agents in the past, including cisplatin, and has experienced periodic disease-free intervals. She has no evidence of abdominal disease and no prior nephrectomy.

Her treatment plan involves the following.

- Chemotherapy: Ifosfamide 4.0 g/m^2 IV piggyback (IVPB) over two hours every day for three days
- Mesna: 4.0 g/m^2 IVPB over two hours every day for three days
- Pretreatment hydration: 1 liter of 0.9% normal saline over two hours every day at chemotherapy
- Premedication: Ondansetron hydrochloride 30 mg IVPB each treatment day; dexamethasone 20 mg IVPB each treatment day

Ms. M received her first cycle of this regimen as an inpatient and tolerated therapy well. Her second cycle was administered as an outpatient. The pretreatment assessment for the second cycle follows.

- ECOG performance status 0
- Alert and oriented to person, place, time, and situation
- Serum albumin 4.2 g/dl
- Serum creatinine 2.1 mg/dl

In the evening of day three of her second cycle, Ms. M was admitted to the hospital with a diagnosis of ifosfamide encephalopathy and dehydration. Her husband reported to the oncology clinical nurse specialist that on the two evenings prior to admission, some of her sentences "were a little off" and that the problem was a little more pronounced on the second day. Because her symptoms were gone by the next morning after both occurrences, Ms. M's husband did not report them. On the evening of her admission to the hospital, her husband stated that she had become increasingly confused and somnolent, and he contacted the medical oncologist.

On admission, Ms. M was confused, having hallucinations, and somnolent more than 50% of the time. She was given methylene blue injection 50 mg by IV push over five minutes into the Y-port of a 0.9% normal saline IV. She received a total of 200 mg in a 24-hour time period, and her baseline neurologic status returned to normal (NCI toxicity grade of 0).

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Clinical Highlights: Ifosfamide Encephalopathy

Incidence: 10%–15% of patients treated with ifosfamide (Pelgrims et al., 2000)

Possible risk factors: Low serum albumin (< 3.5 g/dl), elevated serum creatinine, bulky abdominal disease, previous cisplatin (> 300 mg/m^2 cumulative dose), prior nephrectomy, and poor performance status (Cain & Bender, 1995)

Pathophysiology: Chloracetaldehyde, a metabolite produced by ifosfamide oxidation, is believed to play a major role. This metabolite is structurally similar to chloral hydrate and ethanol, which are both central nervous system depressants.

Clinical findings: The most commonly reported findings are somnolence, confusion, depressive psychosis, and hallucinations. Less frequent symptoms include dizziness, disorientation, and cranial nerve dysfunction. Seizures and coma with death have been reported. Signs of central nervous system toxicity can occur within two hours of infusion and usually resolve spontaneously within one to three days after the drug is discontinued.

Treatment: Discontinue the ifosfamide infusion. Methylene blue has been reported to reverse encephalopathy within 24 hours of administration (Pelgrims et al., 2000). If neurotoxicity occurs, future doses should be reduced or discontinued entirely (Cain & Bender, 1995).

Cain, J.W., & Bender, C.M. (1995). Ifosfamide-induced neurotoxicity: Associated symptoms and nursing implications. *Oncology Nursing Forum, 22,* 659–668.

Pelgrims, J., De Vos, F., Van den Brande, J., Schrijvers, D., Prove, A., & Vermorken, J.B. (2000). Methylene blue in the treatment and prevention of ifosfamide-induced encephalopathy: Report of 12 cases and a review of the literature. *British Journal of Cancer, 22,* 291–294.

The solutions offered to the clinical problems posed in this column are the opinions of the authors and do not represent the opinions or recommendations of the Oncology Nursing Society, the Oncology Nursing Forum, *or the editorial staff.*