Ultraviolet recall due to cytarabine chemotherapy for acute myeloid leukaemia

Dennis John Kuo ¹, Jeanie Marie Spies,² Nathalie Le Floch,² Victor Wong¹

¹Pediatric Hematology-Oncology, University of California San Diego School of Medicine, La Jolla, California, USA

²Pediatric Hematology-Oncology, Rady Children's Hospital San Diego, San Diego, California, USA

Correspondence to
Dr Dennis John Kuo;
dekuo@ucsd.edu

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DESCRIPTION

A 6-year-old boy with acute myeloid leukaemia (AML) was admitted for his third cycle of chemotherapy on Children's Oncology Group Protocol AALL1831 (cytarabine 1000 mg/m² every 12 hours and etoposide 150 mg/m² daily for days 1–5). On day 3 he developed pain, erythema and oedema of his hands. He had fevers on days 3 and 4, which resolved and did not occur again until day 21. Over the subsequent days the fingers, hands, forearms and elbows became tender to touch and painful to flexion and extension (**figure 1**). Furthermore, erythema and swelling developed on his bilateral forearms, calves, neck, face and lips, with superficial ulcerations of the lip (**figure 2**). Despite these symptoms he was active, talkative, feeding well and completed the 5 days of chemotherapy. The rash was treated with topical lidocaine cream and moisturisers. He also received oral pyridoxine 50 mg daily for 10 days. Around day 9 of the cycle, the rash started healing with the worse affected areas of the hands developing superficial desquamation (**figure 3**). By day 15 the rash had mostly resolved, and he was discharged home on cycle day 28.

The diagnosis of palmar-plantar erythrodysesthesia was considered, but the distribution was not consistent with this diagnosis as the feet were not involved but the face was.¹ High-dose cytarabine syndrome was also considered to explain the rash, but the patient did not have the persistent fevers, malaise or conjunctivitis that can be associated with

Figure 2 Day 7 facial erythema and swelling, and ulceration of the lip.

this diagnosis. It was noted that the distribution of the rash to areas that would not have been well-covered by a hat, short-sleeved shirt, short pants and shoes approximated areas of sun-exposed skin prior to admission. During the admission for administration of chemotherapy, he had been mostly indoors with little sun exposure. However, the week prior to admission he had been playing outdoors a lot. His parents were applying sunscreen regularly to his skin as he is of Caucasian heritage with very fair skin, freckles and red hair.

Prior to his subsequent admissions his parents were more careful with sun protection, limiting the time of sun exposure, and using sunscreen more aggressively. When he was readmitted for his fourth cycle of chemotherapy (cytarabine 1000 mg/m² every 12 hours on days 1–4, mitoxantrone 12 mg/m² daily on days 3–6 and dexrazoxane 480 mg/m² daily on days 3–6), the rash again developed around day 3 on his face, hands and forearms, but with less intensity than during the previous cycle. The rash

Figure 1 Day 6 of the third cycle of chemotherapy. erythema, swelling and induration of the hands, forearms, elbows and neck. movement of the fingers and elbows was limited by pain.

Figure 3 Day 9 of the third cycle of chemotherapy. extensive desquamation of the hands. pain had decreased to 50% of the maximal pain earlier in the week.

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Images in...

improved with topical therapies, pyridoxine and hydroxyzine, and was mostly resolved by day 15. With his fifth cycle of chemotherapy (cytarabine 3000 mg/m² every 12 hours on days 1–2, 8–9; Erwinia asparaginase 25 000 units/m²/daily on days 2 and 9) and even stricter restrictions on sun exposure, the rashes did not recur.

Radiation recall is a well-known phenomenon when the administration of certain chemotherapy agents (eg, anthracyclines, taxanes, actinomycin-D, methotrexate, gemcitabine and capecitabine) after prior therapeutic radiation therapy causes a tissue reaction in previously irradiated areas. Two aspects of this case are unusual. First, this patient did not receive therapeutic radiotherapy, rather the skin affected was sensitised by sun exposure. Basile describes a similar ultraviolet recall dermatitis after docetaxel and cyclophosphamide given to a breast cancer patient after sunbathing without sunburn.² Second, cytarabine, the agent common to the two cycles of chemotherapy

involved, is not typically thought of as one that induces radiation recall. Gemcitabine, a pyrimidine analogue like cytarabine, is also rarely associated with radiation recall, with a 2010 review discovering only 29 cases published.³ A PubMed search for cytarabine and radiation recall only discovered two articles. One article describes radiation recall in a lymphoma patient who had received high dose cytarabine after relapsing after an earlier course of chemotherapy and radiation therapy.⁴ The second describes a lymphoma patient who had an ultraviolet recall reaction after receiving high-dose methotrexate and high-dose cytarabine.⁵ Patients receiving potentially radiation recall-inducing chemotherapy should be made aware of such risks associated with excessive sun exposure.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

ORCID iD

Dennis John Kuo <http://orcid.org/0000-0003-4154-0057>

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Patient's perspective

The patient's parents report that after the first episode of this skin reaction, they were better able to prepare for subsequent cytarabine-containing chemotherapy due to the knowledge of the importance of using sunscreen, covering exposed areas of the body, and avoiding excessive sunlight.

Learning points

- Cytarabine is a less commonly recognised cause of radiation recall and ultraviolet recall.
- Patients receiving potentially photosensitising chemotherapy should avoid excess sun exposure and use sunscreen to decrease the risk of ultraviolet recall reactions.

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