Case Report: Delivery of Hemodialysis Treatments to a Patient Receiving I-131

Kristine Van Tassel, MSN, RN, NP-C; Clarissa Garrett-Golden, RN; Lorrie Soares, RN; Lenie Bernaga-Ensign, RN; Crissy Fonseca

DaVita Inc, Denver, CO, USA

Introduction

- Radioactive iodine (RAI; I-131) is used in the treatment of thyroid cancer. [1]
- Delivery of hemodialysis to a patient with end-stage kidney disease (ESKD) receiving RAI treatment presents the potential for exposure of care team members to ionizing radiation and the contamination of equipment. [2]

Case Summary

In this case report we evaluate the events occurring before, during, and after delivery of two hemodialysis treatments to a 54-year-old female patient with ESKD who was admitted to the hospital for RAI treatment of thyroid cancer.

Treatment Plan Stakeholders

- *Oncologist*
- *Nephrologist*
- *Hospital Saftey Officer*
- *Dialysis Leadership*
- *Unit Manager*

Case Discussion

Treatment Plan Development

- A team of stakeholders comprising the oncologist, nephrologist, hospital safety officer, unit manager, and dialysis leadership team was convened to develop a plan covering all aspects of the admission and the logistics of hemodialysis delivery.
- Education on radiation safety was provided for dialysis staff by the oncologist in the 2 weeks immediately preceding the planned admission.
- A dedicated dialysis machine was used for the patient throughout her admission.

Anticipated Problems

Potential Problem		*Risk of Radiation Exposure*
Reduced RAI Clearance	→	Patient
Care Team Exposure	→	Dialysis Nurse
Machine Contamination	→	Nursing / Hospital Staff

Care Timeline

- Day 1: Hospital admission and administration of RAI
- Day 2: Hemodialysis 24 hours after RAI administration
- Day 3: Hemodialysis 48 hours after RAI administration and discharge from the hospital

Admission to Discharge Timeline

Day 1	Day 2	Day 3
Patient admitted and treated with RAI	Hemodialysis 24h after RAI	Hemodialysis 48h after RAI and discharged

Hemodialysis Treatment Strategy

- Two dialysis nurses provided care for the patient and were issued with dosimeters.
  - Each nurse spent a maximum of 15 minutes at a time in the patient's room.
- During treatment, nurses remained behind a shield: from here, they could directly observe the patient and were immediately available in the event that an intervention was required, but had the benefit of barrier protection.
  - As an additional precaution, a sign was placed above the patient's bed to alert allied care staff to the patient's radioactive status.
- On discharge day, the dialysis machine was removed from use and placed in storage until biomedical engineering staff could complete their evaluation.

Hemodialysis Strategy

- *Two dialysis nurses*
- *≤15 minutes in the room at a time*
- *Radiation shield for observation*
- *Machine quarantined post discharge*

Conclusion

Use of an interdisciplinary care team to develop a plan covering all aspects of care delivery prior to admission potentially led to improved safety and efficiencies related to the delivery of hemodialysis to a patient receiving RAI treatment for thyroid cancer. This approach may also help to reduce the risk of unnecessary exposure of care team members to ionizing radiation.

References

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Correspondence: Kristine.Pardilla@davita.com

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