

Cardio-Oncology, Nephro-Oncology and the Urologic Oncology Collaboration

Many of us who specialize in urology may have never been introduced to the disciplines known as Cardio-Oncology and Nephro-Oncology. Even those of us who focus on Urologic Oncology may have never heard of this group of relatively new sub-specialized physicians. Both were established a little over a decade ago and have been expanding in numbers, offering their unique expertise in the management of patients with cancer. In many cancer centers, these sub-specialists already collaborate with medical and radiation oncology specialists.

The connection between cardiology and oncology begins with the concept that cancer and cardiovascular disease are the two most common causes of death and disease worldwide with the incidence of both increasing with age. The connection goes even further when considering the impact of cancer treatment on the cardiovascular system. This is perhaps most apparent when discussing advances in cancer treatments and supportive care with the ever increasing number of survivors of childhood cancer. One example is Hodgkin's lymphoma patients who have received radiation as part of their treatment. Cardiovascular disease is one of the most common causes of death in these patients. As the numbers of cancer survivors grow, so does the number of patients living with the late effects of cancer-related cardiotoxicity. Some cardiac diseases predate the diagnosis of cancer, whereas other conditions like chemotherapy-induced cardiomyopathy and radiation-related heart disease are directly related to the cardiotoxic side effects of cancer therapy. Chemotherapy frequently induces thrombocytopenia, which in itself poses a therapeutic challenge in the management of conditions such as acute coronary syndrome, atrial fibrillation, stroke, and patients with prosthetic valves.

There are several examples of agents used in urologic oncology that may cause significant cardiovascular toxicity. Sorafenib, sunitinib, abiraterone, and enzalutamide can cause hypertension. Increased arterial thromboembolism events are seen with abiraterone, and sorafenib. Congestive heart failure can be a consequence of treatment with pazopanib and sunitinib.¹ The International CardioOncology Society (IC-OS) was founded in 2009 and has expanded the number of specialty clinics, developed more training programs and now offers an IC-OS certification in CardioOncology.²

Nephro-Oncology, sometimes referred to as Onco-Nephrology, is a discipline with a similar approach to Cardio-Oncology, with the focus on all aspects of kidney-related complications in cancer patients. Much like the age related increases in cancer and cardiac diseases, renal diseases increase with age with kidney disease frequently complicating cancer care. The US Renal Data system (USRDS) notes that acute kidney injury (AKI) rates are increasing, with our older population having AKI rates 10 times higher than in the non-elderly population.³ Urologists are familiar with renal compromise resulting from obstructing malignancies, the consequences of procedures such as partial or radical nephrectomy and complex fluid and electrolyte disorders. Urologists have come to rely on our nephrology colleagues for helping manage these complex patient care issues. Traditional chemotherapy regimens for many urologic and non-urologic malignancies are often prescribed based on overall renal function. Newer classes of medications such as targeted therapies and immunotherapies along with more intensive chemotherapy regimens can cause nephrotoxicity. Immune checkpoint inhibitors can cause acute kidney injury with acute tubular interstitial nephritis and other glomerulonephritis related conditions impacting renal function.⁴ The American Society of Nephrology (ASN) has developed an on-line curriculum to develop individuals with expertise in this area along with hosting regular Onco-Nephrology/Nephro-Oncology meetings.⁵

The expansion of therapeutic options for a wide variety of malignancies beyond the GU system has created increasingly complex nephrology management issues. According to nephrologists Drs. Pezazella and Rosner: *“Emerging kidney toxicities associated with drugs targeting VEGF and TKIs and other signaling pathways, tumor lysis syndrome, cytotoxic chemotherapy-induced kidney toxicities..... acute and chronic kidney injuries, obstructive uropathies, severe fluid and electrolytes abnormalities, and dosing and timing of chemotherapy in CKD and ESRD patients: these and other complex problems, and their increasing frequency and severity, provide a unique and unprecedented opportunity for nephrologists to improve treatment for cancer patients worldwide.”*⁶

At present, these specialized cardiac and nephrology cancer centric programs are not widely available. Our internal medicine colleagues are engaged in training programs with a new generation of cardiologists and nephrologists taking the lead in supporting medical oncology, radiation oncology and surgical urologic oncology specialists. This collaboration addressing the cardiac and renal implications of cancer is good thing for our traditionally trained oncology specialists and more importantly, good for our cancer patients.

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References

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