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Commentary

The role of onconephrology in cancer patients

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ABOUT THE STUDY

Onconephrology is a specialized branch of nephrology that focuses on the study of kidney diseases in individuals with cancer. An onconephrologist is a trained nephrologist who specializes in treating patients who have both cancer and kidney disease. This subfield of nephrology deals with a range of conditions including nephrotoxicity resulting from traditional and emerging chemotherapy treatments, kidney diseases linked to stem cell transplants, paraneoplastic kidney disorders, paraproteinemias such as Myeloma and Amyloidosis, and electrolyte imbalances that are associated with cancer.

Scope of practice

There are a number of features of this study that set onconephrology apart from ordinary nephrology because onconephrologist addresses kidney disease in cancer patients as their primary population. Patients receiving chemotherapy, for example, may suffer kidney damage as a result of the destruction of cancer cells. There are also numerous complex electrolyte disorders that can occur as a result of cancer or as a side effect of chemotherapeutics. The Syndrome of Inappropriate Antidiuretic Hormone (SIADH), a low serum sodium concentration disorder, was first described in lung cancer patients and is a common electrolyte disturbance seen in this population. Fluid, electrolyte, and acid-base disturbances are much more common and often severe in chemotherapy patients. Several chemotherapeutic agents, including cisplatin, have been linked to acute and chronic kidney damage. Furthermore, there is a growing awareness that primary haematological and oncological disorders can have an impact on the kidneys in the form of glomerular disease, which can manifest as proteinuria, hematuria, hypertension, and kidney function decline. Hematological cancers, such as Monoclonal Gammopathies (paraproteinemias), can have serious kidney consequences in the form of Cast Nephropathy or Systemic Light Chain Amyloidosis. There is also a growing awareness of paraneoplastic glomerular diseases like Membranous Nephropathy and Minimal Change disease, which can be caused by occult malignancy. Onconephrology also includes kidney diseases that are specific to bone marrow transplant (also known as Stem Cell Transplant or SCT) and are commonly seen in cancer patients. Graft-*versus*-host disease, sinusoidal obstruction syndrome, and thrombotic microangiopathy are all kidney diseases associated with SCT.

Acute kidney injury in cancer patients

Acute Kidney Injury (AKI) is a commonly feared complication in cancer patients because it can disrupt life-saving therapy and have fatal consequences. The exact prevalence of AKI in this population varies. In one retrospective study of a single centre ICU, the risk of death was as high as 6%, and 60-day survival was as low as 14% in those who needed dialysis. AKI in this population can be caused by volume depletion from vomiting and diarrhoea after chemotherapy, or it can be caused by chemotherapeutic agent kidney toxicity. AKI can also occur less frequently as a result of a tumour obstructing urine flow, lymph node enlargement, or vascular microthrombi as seen in Thrombotic microangiopathies. Anti-Vascular Endothelial Growth Factor (anti VEGF) agents are also linked to similar injuries, as well as proteinuria, hypertension, and thrombotic microangiopathy. Cancer cells can also cause AKI by infiltrating the kidney or precipitating in the tubules, as seen in paraproteinemias.

Chronic kidney disease in cancer patients

With more effective cancer management options, there are far more cancer survivors with residual decline in kidney function from the aforementioned causes. Cancer and Chronic Kidney Disease (CKD) patients have significantly lower survival rates than the general population. The estimation of kidney function in cancer patients is of particular interest because it has a direct impact on chemotherapy dosing, selection, and eligibility for chemotherapeutics. Overestimation of kidney function can result in overdosing and drug toxicity, whereas underestimation of kidney function can prevent patients from receiving important novel therapies. More research is needed to determine the most accurate renal function estimation formula. Overall, a collaborative approach with oncologists and onconephrologists is critical in managing CKD and addressing issues like renal replacement therapy and transplantation in this population.

Management

To manage these complex disorders, large academic centres in the United States and other countries have begun to form an onconephrology-related patient approach. Therapy can be as simple

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as limiting offending agents and adjusting chemotherapeutic doses, or as complex as including immunosuppressive regimens.

Renal replacement therapy, such as haemodialysis and continuous renal replacement therapy, is also considered in these patients who have acute renal failure or diseases that lead to end stage renal disease. Active cancer is generally a contraindication to kidney transplantation, but it can sometimes be delayed depending on the type of tumour and the risk of recurrence.

Immunosuppressive therapy after transplantation can increase the risk of malignancies like skin cancer and, in rare cases, cause Post-Transplant Lymphoproliferative Disorders. Some centres may provide kidney transplantation in the case of monoclonal gammopathy with renal significance, but the risk of recurrence is high.

For these reasons, the role of transplantation remains a topic of active debate and expansion.