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Research Article

Onco-Nephrology - The need of the hour for kidney care in cancer patients

Matilda Imeraj
Department of Nephrology, University Hospital Center "Mother Teresa" Tirana, Albania

Enkelejda Çuedari
Department of Oncology, University Hospital Center "Mother Teresa" Tirana, Albania

Alba Agaraj
University of Medicine, Tirana, Albania

Alma Idrizi
Department of Nephrology, University Hospital Center "Mother Teresa" Tirana, Albania

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Abstract

Constitution of the World Health Organization defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." According to latest Global Cancer Data there are more than 20 million new cancer cases and it is predicted to increase to 77% by 2050. The incidence of kidney impairment in patients with cancer is high and it is related with reduced cancer survival. These numbers confirm that both conditions impact health quality of life and need a multidisciplinary approach in order to provide professional care. Onco-Nephrology is a new evolving sub-speciality that addresses the intersection between oncology and nephrology. In this manuscript we aim to highlight the essential role of approved and specialised knowledge as a need of the hour among these patients, to the fullest attainment of health.

Keywords: cancer, kidney disease, onco-nephrology, quality of life, management.

1. Introduction

Cancer is a challenging health problem and is the second leading cause of death in people with chronic kidney disease (Jager, Kovesdy and Langham, 2019). Impaired kidney function can complicate cancer treatment, which affects drug metabolism and clearance. Due to the impact of both conditions, managing cancer in patients with

kidney disease and vice versa requires a multidisciplinary approach. Understanding the optional treatments of this bidirectional relationship is crucial in order to improve patents outcomes. The role of onco-nephrology in enhancing health related quality of life is multifaceted.

2. Kidney disease and cancer relationship

The connection between kidney disease and cancer involves direct and indirect interactions among these conditions and involves multiple pathophysiological mechanisms. Chronic kidney disease and end-stage renal disease are associated with increased risk of kidney cancer, especially renal cell carcinoma (Lees, Ho, Parra-Soto, 2021). Cancers occurring after dialysis or transplantion have long been described, but risk assessment by cancer site has been available only recently (Tu, Wen, Tsai et al, 2018; Weng, Hung, Huang et al., 2011; Mok, Matsushita, Sang et al, 2016). Cancers most strongly associated with dialysis include tumors of the oral cavity (Kaposi sarcoma), bladder, thyroid, lung, liver and cervix. Prolonged exposure to dialysis-related oxidative stress and chronic inflammation increases the risk of cancer (Liu, Zhu, Meng, 2020). CKD and its treatment due to immune dysregulation can lead to immunosuppression, increasing the vulnerability to malignances and infections (Mok, Ballew, Sang, 2020; Tu, Wen, Tsai, 2018; Inker, Schmid, Tighiouart, 2012; Putri, Thaha,, 2014). Chronic inflammation play central roles in both CKD and cancer, promoting disease progression and complications (Lees, Ho, Parra-Soto et al., 2021). Chronic inflammation is a stamp of CKD that contribute to carcinogenesis through the release of pro-inflammatory cytokines and growth factors (Dai, Golembiewska, Lindholm and Stenvinkel, 2017; De Cavanagh, Piotrkowski, and Fraga, 2004; Ebert, Pawelzik, Witasp, Arefin, Hobson, Kublickiene et al., 2020). Accumulation of uremic toxins with the mutagenic effect is also a potential in cancer development (Masereeuw, Mutsaers, Toyohara,, Abe, Jhawar, Sweet et al, 2014).

Certain cancers, particularly metastatic can directly invade the kidneys leading to functional impairment and structural injury that can obstruct urine flow leading to hydronephrosis.

Chemotherapeutic agents can induce oxidative stress and can lead to acute kidney injury (AKI) through direct tubular toxicity and glomerular damage and is related with direct toxicity (De Cavanagh, Piotrkowski, Fraga, 2004; Sevilya, Leitner-Dagan, Pinchev, Kremer, Elinger, Rennert et al., 2014; Bitran, Desser, Billings, Kozloff, Shapiro, 1982). Targeted therapies and check point inhibitors can cause hypertension, proteinuria and autoimmune-related nephritis leading to kidney damage. Radiation therapy can accidentally impact the kidneys inducing radiation nephropathy characterized by interstitial fibrosis, tubular atrophy, and glomerular sclerosis. Kidney and cancer microenvironment affect each other, with factors like angiogenesis (Chertow, Normand, McNeil, 2004; Bitran, Desser, Billings, Kozloff, Shapiro, 1982). Comprehension of kidney-cancer connection is essential for developing targeted therapies and management strategies that address both kidney disease and cancer, eventually

ameliorating patient outcomes.

3. Kidney care in cancer patients

Kidney care in cancer patients is fundamental due to the potential importance of cancer and its treatments on renal function. In the context of cancer treatment before initiating therapy is mandatory to asses renal function, including serum creatinine, estimated glomerular filtration rate (eGFR), electrolytes, and urinalysis. To minimize nephrotoxicity, it is crucial to adjust treatment regimens based on changes in renal function and to identify pre-existing kidney conditions (e.g., chronic kidney disease, nephrotic syndrome)[7] that may impact treatment decisions. It is also important to adjust nephroprotective agents. Close monitoring for acute kidney injury (AKI), blood pressure, proteinuria and managing electrolyte imbalances promptly sometimes demand strict hydration protocols.[7,18] Due to both conditions supportive care and symptom management requires a multidisciplinary approach and collaboration among specialists. Nephrologist should address cancer-related anemia with erythropoiesis-stimulating agents (ESAs) or blood transfusions as indicated. During the pain management use of analgesics should be cautious, considering renal clearance and potential nephrotoxic effects. If contraindicated management strategies include dose adjustment and alternative treatment. Kidney care among these patients need individualized care plans that address both cconditions. By arranging kidney care within the context of cancer treatment, multidisciplinary team can reduce nephrotoxic risks, enhance treatment outcomes, and improve overall quality of life for cancer patients with kidney considerations.

4. The health-related quality of life (HRQoL) in onconephrology patients

Integrated care for onconephrology patients, who are struggling with both cancer and kidney disease, requires a comprehensive, synchronized approach that addresses their complex medical, psychological, and social needs.

The health-related quality of life (HRQoL) in onconephrology patients, especially concerning blood components, involve various aspects influenced by both cancer and kidney disease. Many studies suggests that due to underlying pathologies (e.g., impaired erythropoiesis, chronic inflammation) anemia is one of the conditions that impacts on HRQoL (Gelfand, Schell, Eneanya, 2020). Symptoms like fatigue, weakness, shortness of breath, and reduced exercise tolerance significantly affect daily activities and overall well-being. Interventions to manage anemia improve HRQoL. Cancer and kidney disease can predispose patients to bleeding complications (e.g., thrombocytopenia) or thrombotic events (e.g., increased clotting factors, hypercoagulability), thus management and treatment of coagulation disorders may impact HRQoL (Crawford, Cella, Cleeland et al., 2002).

In onconephrology patients' immune system in compromised. Frequent infections, hospitalizations and the need for antimicrobial therapies can deteriorate quality of

life due to physical discomfort and emotional distress. Enduring with the chronic nature of both cancer and kidney disease, along with associated blood-related complications, can lead to anxiety, depression, and reduced HRQoL (Laugsand, Sprangers, Bjordal, Skorpen, Kaasa, Klepstad, 2010).
Discussions regarding end-of-life preferences, including decisions about blood transfusions and resuscitation preferences, are pivotal for ensuring patient-centered care and maintaining HRQoL preferences. Collaboration among oncologists, nephrologists, hematologists, and palliative care specialists guarantee comprehensive management tailored to individual patient needs. Empowering patients and caregivers with information about managing blood-related complications, treatment options, and supportive care resources ameliorates treatment adherence and overall HRQoL. Addressing physical, emotional, social, and spiritual needs through holistic support services intensify overall well-being and HRQoL outcomes in onconephrology patients.

5. Psychological challenges in onco-nephrology

Patients in onconephrology face distinctive psychosocial challenges. Key psychosocial changes include anxiety, depression, stress, adjustment issues, loss of control self-esteem, sexual health, cognitive effects, social isolation, stigma and misunderstanding (Abdel-Kader, Unruh, Weisbord, 2009). The binary diagnosis of cancer and kidney disease can amplify anxiety and depression, as patients fear about the prognosis, treatment efficacy, and potential complications of both conditions. Managing complex treatment regimens and frequent medical appointments can be extremely stressful, affecting mental well-being. Adapting to life with two serious chronic illnesses can be challenging, leading to adjustment disorders. Patients may feel distraught by the need to adhere to multiple treatment protocols, causing feelings of helplessness and loss of control. Treatments for both conditions can lead to significant physical changes, such as weight transformations, hair loss, and skin changes, impacting body image and self-esteem (Bubis, Davis, Mahar et al., 2018; Tarricone, Ricca, Nyanzi-Wakholi , Medina-Lara, 2016). Sexual health can be affected due to both conditions along with their treatment leading to concerns about intimacy and self-worth (Garcia, Li, Mann et al., 2006). Cognitive changes, often named to as "chemo brain" in cancer patients, can be exacerbated by uremic encephalopathy in kidney disease, leading to memory loss and difficulty concentrating. Physical limitations and the emotional toll of managing both conditions can lead to social withdrawal and isolation. Patients may feel defamed or misunderstood by others, increasing their sense of isolation.

6. Conclusion

Engaging a multidisciplinary approach involving oncologists, nephrologists, mental health professionals, dietitians, and social workers can provide comprehensive care

tailored to the patient's needs. Educating patients about their conditions (Paladino, Lakin, Sanders, 2019) treatment options, and self-care strategies empowers them to take an active role in their care. Addressing the psychosocial changes in onconephrology patients requires a holistic approach that considers the integrated of their physical, emotional, and social health. Implementing comprehensive support and resources can significantly improve their health quality of life.

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