Incidence of kidney toxicity among oncology patients treated with immune checkpoint inhibitors: An onconephrology perspective from a multi-ethnic cohort in Malaysia

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ABSTRACT

Introduction: Immune checkpoint inhibitors (ICIs) have revolutionized cancer therapy. However, ICIs can cause immune-related adverse events, including kidney toxicity. Despite the growing use of ICIs, data on this topic are scarce in Southeast Asia, including Malaysia. **Objectives:** To evaluate the incidence and risk factors of kidney toxicity, survival outcomes, and nephrology referral practices. **Materials and Methods:** A retrospective cohort study was conducted at a tertiary teaching center in Malaysia on oncology patients treated with ICIs between January 2016 and December 2023. Patients aged ≥18 years with baseline kidney function data and a minimum follow-up of three months were included. Clinical data were collected till 12 months post-ICI initiation. Significant kidney toxicity included worsening kidney function (≥30% decline in eGFR), worsening proteinuria, or significant electrolyte disorders. **Results:** 322 patients were included (median age 60.1 years; 39.8% female; 79.5% Chinese). 5.3% had preexisting chronic kidney disease. Concomitant chemotherapy was used in 62.4% of patients. Lung cancer was the commonest cancer (29.5%). 75.2% of patients had stage 4 cancer. Pembrolizumab was the commonest ICI (51.9%), followed by atezolizumab (22.0%). Significant kidney toxicity occurred in 45% of patients: 9.9% experienced worsening kidney function, 33.7% developed worsening proteinuria, and 16.1% had electrolyte disorders, with hyponatremia being the commonest. No significant differences in kidney toxicity or survival were found among different ICIs. Multivariate logistic regression analysis showed that chemotherapy significantly increased the risk of kidney toxicity (adjusted OR: 3.53, p = 0.018). 75% of patients with significant kidney toxicity did not have nephrology referral and none underwent kidney biopsy or immunology tests. **Conclusion:** These findings contribute to the growing body of evidence on significant incidence of kidney toxicity in oncology patients treated with ICIs and potential gaps in clinical management. This study calls for vigilant monitoring and enhanced multidisciplinary collaboration, including early nephrology involvement and future onconephrology research.