MEDICAL THERAPIES AND PHARMACOLOGY

PD-1 AND PD-L1 INHIBITORS IN THE TREATMENT OF NON-MELANOMA SKIN CANCERS

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Background: Immunotherapy using PD-1 or PD-L1 inhibitors has been increasingly reported in a variety of non-melanoma skin cancers (NMSCs).

Objective: To analyze the evidence of PD-1 and PD-L1 inhibitors in the treatment of non-melanoma skin cancer— specifically cutaneous squamous cell carcinoma, basal cell carcinoma, Merkel cell carcinoma, cutaneous lymphomas, soft tissue sarcomas, and malignant peripheral nerve sheath tumors.

Materials and Methods: A primary literature search was conducted with PubMed. The initial search revealed 2831 articles. Inclusion criteria included clinical trials, cohort studies, case series, cross-sectional studies, or case reports of use of PD-1 or PD-L1 inhibitor in human subjects for non-melanoma skin cancer. After duplicate removal and abstract screening, 85 articles met criteria for inclusion. Animal studies and articles not written in English were excluded. These articles were subjected to full-text screen and 44 were included in this systemic review.

Results: PD-1 or PD-L1 inhibitors were effective in treating a variety of NMSCs. The most robust evidence was in the treatment of cutaneous squamous cell carcinomas (phase 1 and 2 clinical trials) and Merkel cell carcinoma (multiple phase 1 and 2 clinical trials). Treatment of basal cell carcinoma, Kaposi sarcoma, leiomyosarcoma, angiosarcoma, undifferentiated pleomorphic sarcoma, and liposarcoma also showed benefit with PD-1/PD-L1 inhibitors but there is more limited data. There does not appear to be efficacy for PD-1/PD-L1 inhibitors in cutaneous lymphomas.

Conclusions: The role of programmed cell death 1 (PD-1) or programmed death-ligand 1 (PD-L1) inhibitors in advanced NMSCs is promising; with utility in advanced squamous cell carcinoma, Merkel cell carcinoma, basal cell carcinoma, soft tissue sarcomas, and

malignant peripheral nerve sheath tumors. Role of PD-1 inhibitors in cutaneous lymphomas is less certain. Overall, more investigation is needed to determine the efficacy, tumor responsiveness, and the safety profile of PD-1 inhibitors in NMSC.