Older Individuals Could Benefit From Cancer Immunotherapy

Many older people have biomarkers indicative of a strong response to checkpoint inhibitors.

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Tumors from elderly people showed promising signs of immune response, suggesting that immunotherapy may be a viable treatment option for this group, according to findings published in Cell Reports.

“The interaction between age, immunity and cancers has been understudied, particularly with the rise of cancer immunotherapies,” Rossin Erbe, a PhD candidate at the Johns Hopkins University School of Medicine in Baltimore, said in a press release about the study.

Immunotherapy works by setting into motion an immune response against tumors. Immune checkpoint inhibitors act by blocking proteins, such as PD-1, that hinder the antitumor activity of T-cells.

Cancer becomes increasingly common with older age. While some clinical trials have found that elderly individuals are as likely to benefit from checkpoint inhibitors as younger people, immunotherapy is infrequently prescribed for older individuals because they have weakened immune systems. Erbe and colleagues studied the relationship between age and biomarkers of response to immunotherapy.

Using genomic and clinical databases, the team analyzed the relationship between age and molecular and cellular markers of immunotherapy response in individuals diagnosed with cancer. The final dataset included 77,732 individuals and 31 different cancer types.

With the aid of this extensive data pool, the team put together an open access web application called Cancer Associations with Molecular Aging to compare age-related factors in both cancerous and normal tissue. In order to analyze immunotherapy response, the researchers took into account the number of genetic mutations in the tumor; expression of immune checkpoint proteins, like PD-1; and markers of inflammatory response as well as the cellular composition of tumors.

The researchers found that aging was linked to various factors that indicate better immunotherapy response, such as tumors with more mutations, higher expression of immune checkpoint proteins and higher activity of immune signaling proteins, like interferon gamma.

On the other hand, the researchers also noticed age-related drawbacks in immune response, including the presence of more macrophages, which suppress immune responses, and a less diverse population of T cells.

“Characteristics of tumors from older patients certainly have biological properties consistent with a robust immune response,” Elana Fertig, PhD, of the Johns Hopkins School of Medicine, said in the press release. “We think this is something that deserves more study using tumor atlases with prospective study designs that are tailored to study aging and immunotherapy response.”

Click here to read the study in Cell Reports.
