

Transplant recipients more likely to develop aggressive melanoma

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Organ transplant recipients are twice as likely to develop melanoma as people who do not undergo a transplant, and three times more likely to die of the dangerous skin cancer, suggests new research led by a Johns Hopkins Bloomberg School of Public Health student.

The findings, reported Aug. 13 in the *Journal of Investigative Dermatology*, suggest that the immunosuppressive medications that transplant recipients receive to keep them from rejecting their new organs—especially the high doses administered at the time of transplant—may make them more susceptible to later stage cancers that are harder to cure. The researchers found that transplant recipients were four times more likely to be diagnosed with regional stage [melanoma](#), which has already begun to spread to other parts of the body.

"We knew that melanoma was more likely in transplant recipients, but we thought it might be a function of intensive screening since they are very likely to develop less deadly forms of [skin cancer](#) and are checked regularly by dermatologists," says Hilary A. Robbins, MSPH, a PhD student in the Department of Epidemiology at the Bloomberg School who conducted much of the research while working at the National Cancer Institute. "To the contrary, we were surprised to see that transplant recipients were particularly at risk for developing melanomas that weren't found until they had already spread."

The researchers were also surprised to see that the risk of aggressive melanomas was especially increased within the first four years after

transplant. Previously, they thought that immunosuppressant medications might act cumulatively and that these cancers would be more likely after many years of taking the drugs. Transplant patients must take immunosuppressant medications for the rest of their lives to prevent organ rejection.

In 2011, there were more than 65,000 cases of melanoma in the United States, making it the deadliest form of skin cancer, according to the Centers for Disease Control and Prevention. Melanoma can spread to other parts of the body and causes over 9,000 deaths every year. It is most commonly linked to exposure to the ultraviolet rays given off by the sun.

Some types of cancer are more common among immune-suppressed people, such as those infected with HIV and transplant recipients. But Robbins says these are typically cancers that are linked to viruses like cervical cancer, Kaposi's sarcoma and lymphoma. Melanoma is not linked to a virus.

For their research, Robbins and the team studied 139,991 non-Hispanic white transplant recipients in the Transplant Cancer Match Study, which is led by Eric A. Engels, MD, MPH, a senior investigator at the National Cancer Institute. The study links the Scientific Registry of Transplant Recipients, which captures data on all transplants in the United States, with 15 population-based cancer registries, and includes information on almost half of the country's transplant population between 1987 and 2010. The researchers found 519 melanomas in this group and analyzed risk factors for developing melanoma.

Using a different data set, the researchers compared outcomes among 182 melanoma patients in the transplant group with more than 130,000 other people with melanoma. Over 15 years, 27 percent of the transplant recipients died of their melanoma, as compared to 12 percent of the non-

recipients. The researchers found that melanoma patients who had received a transplant were three times more likely to die from their melanoma, even for melanomas that were diagnosed at an early stage or were very small.

The researchers found that the late-stage cases of melanoma were associated with use of medication given at the time of transplant that essentially stops T-cells—the main cells of immune response—from functioning in order to keep them from attacking the new organ. Meanwhile, early-stage melanomas were more likely to be found in recipients who were administered a medication called azathioprine, a maintenance drug given long term to some [transplant recipients](#). This drug is known to multiply the effects of ultraviolet radiation, which could lead to the development of melanoma.

Robbins says her group's findings suggest that [transplant candidates](#) should be screened very carefully for skin cancers before receiving their transplant. She says it is possible that some of the melanomas could have been present at the time of transplant, but that immunosuppressive drugs allowed them to spread unchecked. She also says that closer monitoring after transplant could allow melanoma to be detected earlier, preventing patients from developing deadly metastatic cancer.

Many researchers are working to develop transplant protocols that reduce or even eliminate the need for lifelong immunosuppressive medications, as these make organ recipients more likely to develop other medical problems.

More information: "Melanoma risk and survival among organ transplant recipients" *Journal of Investigative Dermatology*, 2015.

Provided by Johns Hopkins University Bloomberg School of Public Health

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