Young blood fights cancer

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"New blood" can revitalize a company or a sports team. Recent research by Tel Aviv University finds that young blood does a body good as well, especially when it comes to fighting cancer.

The TAU researchers, led by Prof. Shamgar Ben-Eliyahu from the Department of Psychology's Neuroimmunology Research Unit, discovered that a transfusion of "young" blood -- blood which has been stored for less than 9 days -- increased the odds of survival in animals challenged with two types of cancer. This finding, reported in the journal *Anesthesiology*, may solve an age-old mystery as to why some blood transfusions during cancer-related surgeries may lead to an increased recurrence of cancer and others do not.

"There is anecdotal evidence pointing to the fact that some surgeons really prefer to use younger blood units. They insist on it. Our research shows their reasoning might be sound," says Prof. Ben-Eliyahu, explaining that the oldest blood in a blood bank usually sits on the shelf anywhere from 40 to 42 days before it expires.

Using an animal model, the researchers conducted tests on rats with leukemia and breast cancer. The odds of surviving the cancer, they found, were only compromised if the transfusion blood had been stored for nine or more days.

Can Transfusions Cause More Cancer?

"I don't think this study will or should change the practices of surgeons

in hospitals, but it is definitely something that needs to be investigated further in human clinical studies," says Prof. Ben-Eliyahu. "It might have a serious impact on the survival of prostate or colon cancers -- two cancers that are associated with a lot of bleeding. If our research proves to be true in human trials, it should revolutionize the way we look at transfusion in cancer patients."

The study, Prof. Ben-Eliyahu points out, also led to one other interesting finding. Surgeons commonly transfuse blood from which white blood cells have been removed, believing that these cells can cause harmful effects in the recipient.

"However, we found that it was the red blood cells, not the white blood cells, which caused the negative effects," he says. Because red blood cells carry oxygen to the body, transfusions cannot be withheld, but using fresher blood might be better for cancer patients, the professor maintains.

Banking Your Own Blood May Not Be Helpful

While Prof. Ben-Eliyahu urges that further studies need to be done in this potentially life-saving practice, he believes that in most cases of cancer, donor blood might be healthier for the recipient than one's own blood, because such a supply is commonly built up in a bank weeks before an operation. "The age of the blood itself impacts survival. The best recipe for transfusions might be fresh blood from other people. We found no differences between autologous blood and blood from other donors. The latter can be stored for much shorter durations before use."

The idea that transfusions of "older" blood may increase cancer metastasis remains controversial, Prof. Ben-Eliyahu notes. Negative effects might be limited to specific cancers or special circumstances. He suggests that researchers investigate not just any database relating blood

transfusions to cancer, but only those that include data in which the transfusion itself was a risk factor in metastasis.

In other words, Prof. Ben-Eliyahu recommends that one should first establish, in a given dataset, that blood transfusion is a risk factor for cancer progression, and only then it will make sense to test whether the storage duration of blood affects survival rates. Alternatively, it is possible that blood transfusion is a risk factor in some types of cancer, but not in others, and it will thus be wise to test whether the storage duration of blood affects survival rates only in these specific types of cancer, he says.

If proven true in human studies, Prof. Ben-Eliyahu's research -- done in collaboration with Shir Atzil, a doctoral student -- could broadly impact the healthcare system. Blood banks are already dealing with severe blood shortages in America, and the increased use of fresher blood will make it even harder to keep blood on the shelf. Cost is another factor, but a lower mortality rate may outweigh the price in dollars and cents.

Source: American Friends of Tel Aviv University