CCNM | Patterson Institute for Integrative Oncology Research

Dichloroacetate (DCA) in Cancer Care: Patient Resource

What is DCA?

Dichloroacetate (DCA) is a medication that has been studied as a possible cancer treatment. It is not approved for treating cancer, but some doctors prescribe it "off label" for this purpose.

What is DCA used for?

DCA has been studied and prescribed off-label as it may help to reduce tumour size, improve survival, and reduce cancer related symptoms. However, DCA is an experimental treatment, and effectiveness for these uses is not proven. DCA should not be used as an alternative to chemotherapy or other approved cancer treatments.

Does DCA work?

Only a few small studies and case reports have looked at DCA as a cancer treatment. Some studies found that DCA helped tumors shrink or stay the same size, but not all patients responded. The only randomized controlled trial involved people with advanced head and neck cancer. In this study, more patients who received DCA alongside their chemoradiotherapy treatment saw their tumors shrink compared with those who did not, but survival was the same. Some case reports also showed tumor shrinkage and long-term survival in patients with advanced cancer, which is encouraging. However, larger studies are needed to know whether DCA is safe and effective. Cancer types that have been studied in clinical trials include brain cancers, head and neck cancers, lung cancer, multiple myeloma, and mixed advanced cancers. Case reports have been published for leukemia, non-Hodgkin's lymphoma, colon cancer, stomach cancer, melanoma, angiosarcoma, neuroendocrine pancreatic cancer, kidney cancer, and thyroid cancer.

DCA should not be used as a replacement for other better studied and more effective cancer treatments.

How does DCA work?

In the context of cancer, DCA is believed to work by changing how cancer cells produce energy, also known as cellular metabolism. Cancer cells have different metabolism than healthy cells; they primarily use sugar to produce energy without using oxygen, a process called glycolysis. This process creates lactic acid as a by-product which benefits cancer cell growth. DCA is thought to change metabolism back to the usual process where oxygen and sugar together are used to produce energy, and no lactic acid is produced. DCA does this by inhibiting an enzyme called pyruvate dehydrogenase kinase. In doing this, DCA may promote cancer cell death.

Is DCA safe?

DCA is likely safe when used appropriately in a medically supervised environment; however, it is not without risk. There are times when DCA should not be used. It should not be used in pregnant or lactating individuals. DCA should be used cautiously in people with liver disease or when taking medications that may damage the liver. It should be used cautiously with other medications that have neurological effects such as benzodiazepines. Theoretically, the use of DCA could increase the risk of tumor lysis syndrome in people undergoing other cancer treatments due to increased cancer cell death.

What are the side effects of DCA?

The most common side effect is peripheral neuropathy (tingling and numbness of the toes primarily). This goes away when DCA is stopped. Other side effects reported in clinical trials include fatigue, confusion, memory loss, sedation, tremors, gait abnormalities, central neuropathy, hallucination, agitation, depression, fever, diarrhea, heartburn, nausea, liver enzyme elevation, thrombocytopenia (low platelets), and low calcium. Side effects are generally mild, but occasionally severe side effects have been reported.

How is DCA used?

DCA can be given as an oral pill or injected intravenously (IV; into a vein). When given as a pill it is usually taken twice a day, with the most common dosing ranging from 6.25-12.5mg/kg twice a day. When given IV it is usually given once weekly with similar dosing to oral. In studies and case reports DCA has been used from a few weeks to several years based on how the patient tolerates the treatment and the effects.

Where can I get more information?

For more detailed information including references you can read the companion healthcare professional version on the CCNM research website. You can also consult with a health care provider such as a medical doctor or nurse practitioner who is experienced in the use of DCA.

Disclaimer:

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