Canadian AIDS Treatment Information Exchange
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FactSHEET

DNCB

Summary

DNCB is an inexpensive treatment used by some people living with HIV to enhance their immune system function. A solution of DNCB is applied to the skin on a weekly basis.

What is DNCB?

DNCB, also known as dinitrochlorobenzene or 1-Chloro-2,4-dinitrobenzene, is a chemical used in the development of colour photographs. It is manufactured in bulk for this purpose and is not approved in Canada for the treatment of any medical condition. Since the 1920s, DNCB has been used in research into immune system function. Its use began after skin reactions were observed in workers in photochemical plants. Researchers found that applying DNCB to the skin caused a kind of allergic reaction called a delayed-type hypersensitivity reaction. Immunological research over the last 50 years has shown that delayed-type hypersensitivity reactions are caused by the cell-mediated portion of the immune system, which is the component of the immune system damaged by HIV infection. A standardized way to test cell-mediated immune function was proposed in 1972, and DNCB became widely used by researchers for this purpose. The test method involved applying DNCB to the skin; if DNCB failed to cause a delayed-type hypersensitivity reaction, the cell-mediated immune system likely was not functioning properly. Researchers also observed that DNCB would actually stimulate the cell-mediated immune response, causing a stronger skin response, during subsequent applications of the chemical.

How is DNCB used?

1. To enhance immune system function

Some people living with HIV use DNCB to enhance their immune system function. DNCB is applied to the skin where it is absorbed and carried to the lymph nodes by immune system cells. Within the lymph node network, DNCB is thought to stimulate several parts of the cell-mediated immune system — specifically those parts that are weakened in HIV disease. DNCB seems to prompt the cell-mediated immune system both to produce chemicals (called cytokines) that regulate the immune system and to increase specific immune cell levels. People who use DNCB suggest that it stabilizes CD4+ cell levels (or at least slows their decline) and increases levels of other immune cells important in the control of HIV. Several small trials support these claims, including a Brazilian trial of 35 individuals who used DNCB over an 18-month period. The HIV-positive people in this study experienced increases in CD4+ and other immune cells as well as a significant weight gain when compared to a control group not using DNCB. An earlier 1994 American trial of 24 people also saw increases in some immune cells and a significantly slower rate of CD4+ cell loss. Fewer people using DNCB became ill or died. One year later, less than half the group continued to use DNCB but

they remained healthier than those who had stopped using it. It is important to note that no one in these trials used or had access to current antiretroviral treatment combinations.

A more recent study in Texas enrolled 90 HIV-positive people using protease inhibitors. In this double-blind, placebo-controlled trial, researchers compared the effects of DNCB to fake DNCB, both applied weekly to the skin. Over twelve months, the people receiving DNCB experienced greater increases in their CD4 and CD8 cell counts and cell-mediated immunity than those who did not receive DNCB. Users of DNCB also appeared to experience greater reductions in viral load than non-users.

2. To treat Kaposi's sarcoma

Dr Bruce Mills, a dermatologist, was one of the first people to suggest the use of DNCB to enhance the immune function of people with HIV. He observed that Kaposi's sarcoma (KS) lesions shrank and that skin discolouration decreased in some of his patients when they used DNCB. This was also observed in one of the participants in the American trial described above. Some people who use DNCB apply the solution directly to their KS lesions. But the beneficial effects of DNCB on KS are temporary, lasting only until the treatment is discontinued.

Dosage

When using DNCB for the first time, most people apply a dilute solution of 10% DNCB to a small patch of their skin. This application is intended to stimulate the immune system to respond to DNCB. After waiting two weeks, users apply a less concentrated 2% solution of the chemical to a small patch of their skin. This procedure is repeated every week. The application of DNCB should produce redness, itchiness and perhaps even blisters or raised welts — all signs that the immune system is responding to DNCB. If the symptoms are too severe, a person usually switches to a more dilute dose (like 0.2% or 0.02%). If there are no visible symptoms, a person may use a more concentrated solution. In no case should DNCB be used more than once a week.

Side effects

Side effects from the application of DNCB can include redness, swelling, and itching at the application site. While this reaction is a sign that DNCB is stimulating the cell-mediated immune system, it is also uncomfortable and may cause scarring in some people. In most cases, this reaction can be treated with calamine lotion, camomile compresses, aloe vera, or other anti-itch creams sold over the counter. Some people may experience more serious reactions, including blistering and burning of the skin, and a rash that may spread across the entire body. In most cases, this rash is short lived, but if DNCB use is continued, a lower dose should be used. In rare cases, people may need to discontinue the use of DNCB altogether.

The site where DNCB is applied may become more sensitive to sunlight. People who experience serious reactions to DNCB may also experience a generally increased sensitivity to sunlight. Rare reports of nausea and dizziness have also been made by people using DNCB. Some may also develop new allergic reactions. Despite some concerns raised in the mid-1980s, DNCB is not a cancer-causing agent.

Availability

A DNCB starter kit and follow-up supplies of 2% solution can be ordered from Union Square Medical Associates (USMA) at (415) 283-1911. (The starter kit contains four dilutions of DNCB: 10%, 2%, 0.2% and >0.02%). The starter kit costs $50 (US), and additional bottles of solution are $15 (US). USMA has had no difficulty shipping DNCB into Canada. Currently, there are no Canadian suppliers. One DNCB kit should last between three and six months. For more information about DNCB, visit the USMA Web site at www.usmamed.com.

Credits

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Modified: May 1999

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Funding has been provided by Health Canada, under the Canadian Strategy on HIV/AIDS.