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THE XIV INTERNATIONAL AIDS CONFERENCE

A. Overview of conference

The recent International AIDS Conference, July 7-12, in Barcelona, was perhaps one of the more political of this series of conferences, if only because several current and former heads of state were among the more than 15,000 delegates. Many people in the world will be counting on these politicians, who include Bill Clinton and Nelson Mandela, to help in the effort to bring the worldwide spread of AIDS under control.

Devastation by numbers

The figures provided by UNAIDS, the United Nations agency that coordinates UN programs, are mind-numbing. Currently, there are at least 40 million people who are HIV positive, 95% of whom live in low-income countries. If current rates of infection continue, by the end of this decade we can expect the following:

- 45 million *new* HIV infections
- 25 million children left orphaned
- reduced economic output because of illness, particularly in Southern Africa
- possible disintegration of some societies due to the immense scale of devastation

Stopping the devastation

It is possible, even in the absence of an effective vaccine, to slow down and eventually halt the social and economic damage caused by AIDS. Plans to do so were approved by the UN at last year's special session on AIDS in New York. To implement those plans around \$10 billion U.S. per year is required. The Global Fund to Fight AIDS, TB and Malaria has been formed to help raise that

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money. Unfortunately, the Fund has received only \$2 billion U.S. because high-income countries have not honoured their commitments. For every year of delay in implementing a comprehensive anti-AIDS plan, the UN estimates that 5 million people will die. Since its arrival in 1981, AIDS has killed 20 million people. It is not clear how many more people have to die before such a plan is given adequate funding.

Despite the disappointing level of fundraising, small projects by agencies such as Médecins Sans Frontières (Doctors without Borders) and others are helping to stem the spread of infection and bring anti-HIV drugs to low-income countries. Although a good first step, without increased funding and support, these small projects by themselves will do little to reverse projected trends.

Making links

The conference provided a forum for frontline AIDS workers to share experiences and success stories and engage in skills building. They also forged links that will be important in the years to come as it becomes clear that, given the present resources, AIDS will not go away in our lifetime. Not surprisingly, the lack of commitment to the Global Fund (and the resulting cost in human lives) angered and mobilized attendees. Indeed, activists frequently held demonstrations and “actions” to highlight important issues relating to prevention, care and treatment.

Treatment news

With regard to treatment, there were no major breakthroughs. For people in high-income countries, the outlook is generally good. More drugs should become licensed in the next year, including T-20 (from a new class of drugs called fusion inhibitors) and atazanavir (a new protease inhibitor). These are merely the tip of the iceberg when it comes to drugs of the future. Indeed, at one conference session, a researcher showed a slide filled with the names of new drugs at various stages in the development cycle. The rest of this issue of *TreatmentUpdate* will focus on selected highlights in treatment research presented at the conference.

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I ANTI-HIV AGENTS

A. American-Italian study produces unexpected results

The availability of highly active antiretroviral therapy (HAART) since 1996 has helped to prolong survival for many people with HIV/AIDS (PHAs) in North America and countries of the European Union (EU). Yet HAART is not without limitations. For instance, although at least 15 anti-HIV drugs are licensed in Canada, none of them can cure HIV/AIDS. Moreover, caring for PHAs in the 21st century has become more complex than when HAART first appeared. Some of the reasons for this complexity arise with issues about the timing and composition of therapy, such as:

- When in the course of HIV disease should therapy be started?
- Which combinations of drugs should be used in an initial treatment regimen?
- When should therapy be changed?
- Which drugs should be used in a rescue or salvage regimen?

Medical research teams in different hospitals are trying to resolve some of these issues. One research group in the United States and Italy conducted a study called ACTG 384 to try to answer several similar questions about initial anti-HIV therapy:

- Is better to start with a combination which includes AZT (Retrovir, zidovudine) and 3TC (lamivudine, Epivir) or ddI (Videx, didanosine) and d4T (Zerit, stavudine)?
- Is it better to start with a protease inhibitor, in this case nelfinavir (Viracept) or a non-nuke, in this study efavirenz (Sustiva)?
- Is it better to use one 3-drug combination and then switch to another 3-drug combination when treatment failure occurs or just one 4-drug combination?

Study details

Researchers enrolled 980 subjects who had minimal exposure to anti-HIV drugs (fewer than seven days) for their study. The profile of subjects at the start of the study was as follows:

- 18% female, 82% male
- average age – 36 years
- average CD4+ count – 278 cells
- average viral load – about 80,000 copies

Subjects were randomly assigned to one of the following six study groups or “arms”:

1. ddI + d4T + efavirenz
2. ddI + d4T + nelfinavir
3. AZT + 3TC + efavirenz
4. AZT + 3TC + nelfinavir
5. ddI + d4T + nelfinavir + efavirenz
6. AZT + 3TC + nelfinavir + efavirenz

If subjects receiving arms 1 through 4 developed treatment failure or toxicity they could switch to another arm of the study, as outlined below:

1. ddI + d4T + efavirenz ? AZT + 3TC + nelfinavir
2. ddI + d4T + nelfinavir ? AZT + 3TC + efavirenz
3. AZT + 3TC + efavirenz ? ddI + d4T + nelfinavir
4. AZT + 3TC + nelfinavir ? ddI + d4T + efavirenz

In the remaining two arms there were no switches:

5. ddI + d4T + nelfinavir + efavirenz
6. AZT + 3TC + nelfinavir + efavirenz

Readers should note that researchers disguised some of the pills so that subjects could not be certain if they were receiving efavirenz, nelfinavir or efavirenz and nelfinavir. Subjects remained in the study for between two and three years.

Results

- Subjects who started therapy with a combination of AZT, 3TC and efavirenz suppressed their viral load and maintained this suppression longer than subjects who started therapy with ddI, d4T and efavirenz.
- Subjects who started therapy with a combination of AZT, 3TC and efavirenz suppressed their viral load and maintained this suppression longer than subjects who started therapy with AZT, 3TC and nelfinavir. However, this difference between the two arms was not statistically significant.
- Subjects who started therapy with a combination containing AZT and 3TC had

fewer toxicities than subjects who started therapy with regimens containing ddI and d4T.

- There appears to be no greater benefit from using a combination of four drugs compared with a 3-drug regimen containing AZT, 3TC and efavirenz.
- In the study, CD4+ cell counts increased significantly and continued to rise over time. CD4+ cell increases were similar across each arm of the study.

Issues to consider

It is important to remember that these are *preliminary* results. The researchers involved with the study are conducting further analyses to try to find out why they obtained the results seen. While some of the differences between arms containing AZT and 3TC and, ddI and d4T may result from toxicity, this does not fully explain the differences detected between the two combinations. The results of this study suggest that a combination of AZT, 3TC and efavirenz may be worth considering as initial therapy for HIV infection.

Detailed results from ACTG 384 are needed so that doctors and their patients can take them into account when making decisions about starting HIV medications. One important lesson from ACTG 384 is that the potency of a drug clearly depends on the other drugs in a regimen and comparing treatment regimens will likely become more complex in the future.

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B. Tenofovir looks good in initial therapy

Tenofovir (Viread) is a relatively new anti-HIV drug that has been licensed in the United States and the countries of the European Union. In studies where tenofovir was used as part of combination therapy in heavily pre-treated HIV positive subjects, the drug helped lower viral loads and caused modest increases in CD4+ cell counts.

Now tenofovir is being tested in people with HIV/AIDS (PHAs) who have had no prior exposure to anti-HIV drugs. The one-year results from this study, called GS-903, are very promising. One

surprising finding from GS-903 is that tenofovir-containing combinations do not appear to cause significant increases in lipid — cholesterol and triglyceride — levels.

Study details

An international team enrolled 600 HIV positive subjects who had the following profile at the start of the study:

- none had previously used anti-HIV drugs
- 28% were female, 72% were male
- average viral load — 81,000 copies
- about 42% of subjects had high viral loads (more than 100,000 copies)
- average CD4+ cell count — 280 cells
- about 38% of subjects had low CD4+ counts (fewer than 200 cells)

Subjects were randomly assigned to receive one of the following two combinations:

- tenofovir, placebo (fake) d4T (stavudine, Zerit), efavirenz (Sustiva, Stocrin) and 3TC (lamivudine, Epivir)
- d4T, placebo (fake) tenofovir, efavirenz and 3TC

The study is supposed to continue for almost three years; at the Barcelona conference, researchers released data from the first year.

Results — Changes in viral load

Equal proportions of subjects — 80% — in each group achieved a viral load of fewer than 50 copies. Moreover, they were able to maintain this level of suppression for the first year of the study. Subjects who entered the study with high viral loads (more than 100,000 copies) were just as able to have it decrease to fewer than 50 copies as did subjects who started the study with low viral loads.

Results — Changes in CD4+ cells

The changes in CD4+ cells were also similar in both groups, with subjects gaining about 168 extra CD4+ cells over the course of the first year. Those subjects who entered the study with low CD4+ counts (fewer than 200 cells) had their counts increase just as much as subjects who entered the study with higher CD4+ cell counts.

Results — Changes to lipid levels

An unexpected development was the change in lipids — cholesterol and triglycerides — detected with blood tests. On average, subjects who received d4T had significantly greater increases in lipid levels than did subjects who received tenofovir.

Moreover, triglyceride levels continued to rise over the course of the study in d4T users while in tenofovir users it initially increased then remained steady.

Until recently, increased lipid levels were commonly associated with the use of other anti-HIV drugs such as protease inhibitors and, to a lesser extent, non-nukes (non-nucleoside reverse transcriptase inhibitors). Now it seems that at least one member of another class of drugs commonly called nukes (nucleoside reverse transcriptase inhibitors) — d4T — may be associated with increased lipid levels as well.

Side effects

Since subjects in both groups were relatively healthy, it is not surprising that both combinations were generally well tolerated, with only about 1% of subjects leaving the study because of severe side effects. Nonetheless, physical side effects did occur, although they were reported in only a minority of subjects as follows:

Tenofovir group

- nerve damage to the hands and/or feet (peripheral neuropathy) — 2%
- lipodystrophy — 2%

d4T group

- nerve damage to the hands and/or feet (peripheral neuropathy) — 7%
- lipodystrophy — 4%

Laboratory testing of blood samples found that about 28% of tenofovir users and 31% of d4T users had very abnormal values. This is not necessarily dangerous; however, having highly abnormal blood tests for a prolonged period of time may eventually lead to complications. Major differences in lab values between the two study groups occurred in lipid levels.

Previous experiments on animals suggested that tenofovir, in high doses, caused kidney damage as well as thinning bones. In this study, about 1% of tenofovir users developed kidney dysfunction, compared with 2% of d4T users. In regard to bone fractures, one case occurred in the tenofovir group and four in the d4T group; all of these were apparently due to some kind of “trauma” not related to HIV. In general, the thickness of the bones of tenofovir users did not change during the course of the study.

All in all, these interim results suggest that tenofovir is generally safe and useful in initial

therapy when used together with other anti-HIV drugs. We look forward to the long-term results of study GS-903.

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C. Tenofovir and Videx (ddI) EC — some caution required

Since tenofovir (Viread) is a relatively new anti-HIV drug, not all interactions between it and the many other drugs used by people with HIV/AIDS (PHAs) are known. However, the manufacturer of tenofovir, Gilead Sciences, has recently reported an interaction with another anti-HIV drug — ddI (Videx EC, didanosine). Doctors may wish to alert their tenofovir- and ddI-using patients to this interaction.

In experiments on healthy, HIV negative people, researchers found that the amount of ddI in the blood increased by about 50% when it was taken on an empty stomach two hours *before* tenofovir and a light meal. Similar results were seen when both drugs were taken *with* a light meal.

In order for PHAs who take both Videx EC and tenofovir to avoid this interaction, there are at least two possible options, according to Vancouver HIV specialist Dr. Julio Montaner, who spoke at the Barcelona AIDS conference:

- Take both drugs — Videx EC and tenofovir — at full dose, several hours apart from each other.
- Reduce the dose of Videx EC from 400 mg/day to about 250 mg/day.

However, Dr. Montaner emphasized that the second option requires a clinical trial to confirm that reduced doses of Videx EC are safe and effective when taken with tenofovir. Therefore, do not do this without consulting with your HIV specialist.

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2. Montaner J. New challenges and perspectives in salvage therapy. *XIV International AIDS Conference, July 7-12, 2002, Barcelona*. Abstract WeOrB192.

D. T-20 shows its potency

Currently available anti-HIV therapy usually is able to suppress HIV activity, particularly in people with HIV/AIDS (PHAs) who are taking their first round of combination therapy. However, many PHAs will, at some point, develop treatment failure. As a result, new drugs are urgently needed.

One of the many new drugs under development is called T-20 (enfuvirtide). T-20 belongs to a new class of drugs called fusion inhibitors. Unlike currently licensed anti-HIV drugs, T-20 works by blocking HIV from entering a cell. Researchers in several continents have been testing T-20 in PHAs who have previously used combination therapy and the results are very promising. In this report, we will focus on the results from one study, called TORO 1, which was conducted in Canada, Brazil, Mexico and the U.S. The results from another study, TORO 2, were very similar.

Study details

All 491 subjects had prior exposure to all three classes of available anti-HIV drugs (nukes, non-nukes and protease inhibitors) or proof of viral resistance to these drugs. All subjects received what the researchers called “optimized background therapy” (OBT) — a combination of between three and five anti-HIV drugs that their doctors decided would be the best available option. Some subjects (326) were randomly assigned to also receive T-20, 90 mg twice daily, injected under the skin.

The profile of subjects at the start of the study was as follows:

- 8% female, 92% male
- average age – 42 years
- average viral load – 158,000 copies
- average CD4+ count – 80 cells

The information released at the AIDS conference was gathered from the first six months of this study.

Results — Changes in viral load

The proportion of subjects who had statistically significant decreases in viral load after six months was as follows:

Fewer than 400 copies –

- OBT and T-20 – 37%
- OBT – 16%

Fewer than 50 copies –

- OBT and T-20 – 20%
- OBT – 7%

Results — Changes in CD4+ counts

The extra CD4+ cells seen in each study group were as follows:

- OBT and T-20 – 76 cells
- OBT – 32 cells

Again, this difference between the two study groups was statistically significant; that is, not likely due to chance alone.

Results — Side effects

Two types of side effects were reported in this study:

- general side effects
- injection site reactions

As subjects in this study were generally not in the best state of health, side effects were common in both groups.

In the T-20 group, some of the side effects included:

- difficulty falling asleep – 10%
- decreased appetite – 8%
- dizziness – 7%

Among the subjects who received OBT only, the proportion of those who reported these side effects was as follows:

- difficulty falling asleep – 6%
- decreased appetite – 3%
- dizziness – 4%

Whether this difference was due to the use of T-20 is not clear.

Injection site reactions

Among subjects who received T-20, 98% developed redness and some swelling at the site where the drug was injected. In general, these injection site reactions (ISRs) were not severe, with up to 50% of subjects reporting no major pain or discomfort that limited their daily activity. In less than 10% of subjects receiving T-20, ISRs required the use of pain relief drugs.

Other issues

Because T-20 needs to be injected twice daily, it is not for everyone. Moreover, in this study of heavily pre-treated subjects, not everyone who received T-20 showed sustained benefit. As well, resistance to T-20 can develop. When T-20 is taken in combination with previously unused drugs (for which there is no resistance), the antiviral response is likely to be greater than seen in either TORO 1 or TORO 2, but studies are needed to confirm this expectation. As T-20 is a difficult compound to make, it is not likely to be cheap. Based on their track record, regulatory authorities in Canada will not likely approve T-20 for at least a year after it is approved in the United States.

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E. Efavirenz makes its mark in AIDS

People who have the life-threatening infections that are the hallmark of AIDS are often excluded from the initial round of clinical trials of AIDS drugs. Therefore, the effectiveness of some anti-HIV drugs in this population may not be well documented.

To try to assess the impact of efavirenz (Sustiva, Stocrin) on AIDS, researchers in Barcelona, Spain, reviewed the hospital records of 92 subjects who had symptoms of AIDS and who used this drug. Their results suggest that the non-nuke efavirenz, when used as part of combination therapy, can be useful for some people with AIDS.

Study details

Researchers found data on 92 subjects who used efavirenz in combination with two nukes (nucleoside analogues) as follows:

- 3TC (lamivudine, Epivir) and d4T (stavudine, Zerit)
- AZT (Retrovir) and 3TC

Researchers examined medical records between July 1999 and November 2001. Here is the profile of the 92 subjects before they began to take efavirenz:

- 17% female, 83% male
- average CD4+ count – 32 cells
- average viral load – 350,000 copies
- average time from diagnosis of AIDS to starting efavirenz-based therapy – one month

Results – Changes in lab tests

The response to therapy was generally good with about 70% of subjects achieving a CD4+ count of at least 100 cells. About 70% of subjects also were able to suppress their viral load below the 50 copy mark.

Results – Survival

There were three deaths during the study period from the following causes:

- wasting
- liver failure due to hepatitis C
- lung cancer

Because highly active antiretroviral therapy (HAART) can cause the immune system to respond to previously quiet infections — something called the “immune restoration syndrome” — sometimes HAART users develop reactivated infections. This occurred for the following three AIDS-related illnesses in the numbers of subjects indicated:

- shingles – four cases
- CMV retinitis – one case
- tuberculosis (TB) – one case

Results — Complications affected by efavirenz

The benefit of HAART becomes clear when PHAs who had been experiencing hard-to-treat complications begin to stabilize or improve when they begin HAART, as in the following:

- parasite-related diarrhea (Cryptosporidiosis) – five cases
- Kaposi’s sarcoma (KS) – four cases
- PML (progressive multifocal leukoencephalopathy) – one case

Only two subjects stopped taking efavirenz because of side effects, which were not described in the researchers’ report.

All in all, this study shows that efavirenz-based combination therapy is useful in people with symptoms of AIDS who also have low CD4+ cell counts.

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II TESTING

A. Study finds fatigue linked to quality of sleep

Fatigue has long been associated with HIV/AIDS. In some people with HIV/AIDS (PHAs), fatigue can be so severe that it is disabling. There are many factors which can cause fatigue, including the following:

- less-than-normal levels of red blood cells (anemia)
- nutrient deficits
- drug side effects
- depression and/or anxiety
- infections
- sleep problems

Researchers at the University of South Carolina investigated several possible causes of fatigue, focusing on the quality of sleep.

Study details

The research team surveyed 57 subjects (60% female, 40% male) who were attending an HIV clinic. The average age of the subjects was 31 years. The team also reviewed medical charts.

Results

Researchers found that fatigue is common and appears early in the course of HIV disease. They also found that quality of sleep and stress levels were linked to having fatigue. Indeed, these two factors accounted for more than 60% of the cases of fatigue. The following trends were also confirmed by the team:

- In the early, symptom-free stage of HIV disease, PHAs tend to have problems falling asleep and staying asleep.
-

- In the stage where there are some symptoms of HIV disease, difficulty falling asleep and daytime tiredness become more common.
- In people with AIDS, “extreme” sleep disruption and fatigue are common.

These problems with sleep and fatigue greatly affected the quality of life of subjects. Further research is needed to understand the cause of sleeping problems in PHAs as well as how to remedy them.

REFERENCE

Phillips KD, Sowell RL and Rojas M. Correlates of fatigue in HIV disease. *XIV International AIDS Conference, July 7-12, 2002, Barcelona*. Poster MoPeB3200.

B. High liver enzyme levels — a warning about survival?

Lab tests can detect levels of certain proteins commonly called “liver enzymes.” Two examples of these enzymes include:

- ALT (SGPT) – alanine amino transferase
- AST (SGOT) – aspartate amino transferase

ALT is made by the liver. AST is made mostly by the liver but also by several other organs/systems, in decreasing order: the heart, skeletal muscles, kidneys, brain, pancreas, lungs, white and red blood cells. Yet, AST is still commonly considered a liver enzyme.

In general, liver enzyme levels rise above normal when the liver is being damaged. In some people with HIV/AIDS (PHAs), higher-than-normal levels of liver enzymes are common, perhaps caused by hepatitis, the toxicity of anti-HIV medications and the use of alcohol and other drugs.

Study details

Researchers at the University of Pittsburg analysed information from a large database on nearly 7,000 subjects to find a link between higher-than-normal liver enzymes, a condition called transaminitis, and survival. They considered liver enzymes to be high when they were at levels twice above normal.

Results

The researchers found that higher-than-normal levels, particularly of AST, were associated with reduced chances of survival. These high AST levels were linked to the following:

- hepatitis B or C infection
- decreasing CD4+ cell counts and increasing viral load
- alcohol abuse
- increasing age

Even after researchers adjusted their calculations by taking into account subjects who had low CD4+ cell counts and high viral loads (and who were therefore at increased risk of death), having elevated AST levels was linked to reduced survival when compared to PHAs who had normal AST levels.

The researchers concluded that high liver enzyme levels have a major connection to survival. They suggest that even mildly elevated levels of liver enzymes deserve attention.

REFERENCE

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III NUTRITION

A. Nutrient deficits found in some HIV positive people

Deficits of nutrients have been linked to a declining immune system and reduced survival among some HIV positive people. There may be many factors that lead to the development of nutrient deficits. Here are a few possibilities:

- HIV-related intestinal infections and complications
- increased need for nutrients because of HIV/AIDS
- poor eating habits

To try to confirm that low intake of nutrients is a factor in the development of nutrient deficiency, researchers in Miami, Florida, performed a study.

Study details

The research team interviewed 39 subjects, all of whom were HIV positive drug users. The profile of subjects was as follows:

- 18% female, 82% male
- most were poor

Results

- 34% of subjects went more than four days without food
- 47% frequently skipped meals
- 31 subjects (82%) received less than the U.S. recommended dietary allowance for zinc (less than 15 mg/day)

Subjects who had very low intake of zinc were also likely to be eating insufficient amounts of food.

Zinc is a mineral that is very important for the health of the immune system. Zinc-rich foods include seafood, particularly shellfish, as well as nuts and seeds.

In this study, researchers found that HIV positive drug users are at high risk for developing deficiencies of zinc and perhaps other nutrients. Inadequate intake of food was linked to lack of income and “social barriers to food-aids” (meaning food stamps). Because zinc is a mineral that is needed by the immune system, its also likely that zinc deficits have an impact on survival of PHAs, particularly in the setting of multiple nutrient deficits.

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B. Low zinc intake linked to reduced survival

Nutrients play an important role in maintaining the health of the immune system. In a study related to the previously mentioned one, researchers Marianna Baum and Adriana Campa have been studying the the relation between nutrient deficits and immunity for many years. They noticed that some symptoms seen in people with AIDS are similar to those seen in people with severe zinc deficiencies, including:

- weakened immunity
- impaired sense of taste
- reduced appetite
- intestinal dysfunction
- diarrhea
- hair loss
- skin lesions
- lower-than-normal levels of testosterone

These researchers and their associates at academic centres in Miami, Florida, conducted a study to understand the relationship between zinc intake and survival in HIV positive people. They found that less-than-normal intake of zinc was linked to reduced survival.

Study details

Researchers regularly monitored 118 HIV positive drug users between 1994 and 1998. Subjects were interviewed about dietary habits and blood samples were analysed for zinc levels. The profile of subjects at the start of the study was as follows:

- 36% female, 64% male
- average age – 42 years
- 90% earned less than US \$10,000 per year

Results

- 85% of subjects consumed less-than-normal levels of zinc from their diet.
- Not surprisingly, a large proportion of subjects – 57% – developed zinc deficiency.
- Low intake of zinc (less than 9 mg/day) was associated with low levels of zinc in subjects’ blood samples.
- Subjects with low zinc levels in their blood were at least 10 times more likely to die than subjects with adequate zinc in their blood. This was the case even when researchers adjusted their calculations for those people with low CD4+ cell counts.
- The risk of dying from AIDS-related complications decreased by one-third for every 1 mg/day that intake of zinc increased. This relationship was not affected by CD4+ count or use of anti-HIV therapy.

According to the researchers, a clinical trial of supplemental zinc in HIV positive people is underway.

REFERENCE

- Baum MK, Campa A, Lai S, et al. Zinc intake and mortality in HIV-1-infected drug users. *XIV International AIDS Conference, July 7-12, 2002, Barcelona*. PosterThPeB7323.
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Disclaimer

Decisions about particular medical treatments should always be made in consultation with a qualified medical practitioner knowledgeable about HIV-related illness and the treatments in question.

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Other CATIE Publications

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Outlines the basics of herbal therapies in understandable terms and reports on the role they can play in various HIV/AIDS-related conditions.

A Practical Guide to Complementary Therapies for Persons With HIV Disease

Describes several complementary therapies in accessible language and the role they may play in treating various HIV/AIDS-related complications and drug-related side effects.

Fact Sheets and Supplement Sheets

Cover conditions, symptoms, side effects, complementary therapies, vitamins, herbs and other treatment issues.

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HIV Viral Load Testing

Presents information about the viral load blood test in a straightforward question-and-answer format.

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Addresses social, legal, health-related and practical issues comprehensively and from a national perspective.

CATIE is a national, non-profit organization committed to providing free, current and confidential treatment information for all Canadians living with or affected by HIV/AIDS.

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