

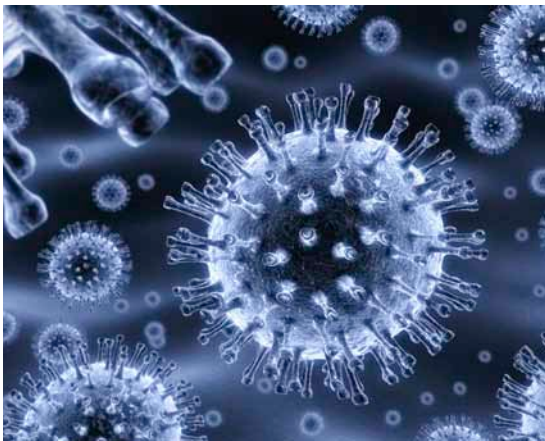


Toronto People With AIDS Foundation

# Treatment Bulletin

## HIV & The Brain

February 2011



### Disclaimer

The Treatment Resources Program at the Toronto People With AIDS Foundation provides information and resources to empower people living with HIV/AIDS to be proactive around their health by working in partnership with their health care providers. We do not recommend or promote any treatment in particular. We strongly urge those interested in any specific treatment to consult a wide range of resources, including a qualified medical and/or complementary therapy practitioner who has experience in working with HIV+ individuals.

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HIV associated cognitive disorders have been gaining attention recently, especially at a time where aging and brain function are at the forefront of many HIV-related discussions in academic and medical forums.

For the past decade, HIV medications have been increasingly successful in preventing some of the severe cognitive degeneration that occurred when the HIV epidemic first began (known then as AIDS dementia complex, or ADC). Recently some HIV+ individuals who have been infected and treated long-term, have begun complaining about issues with memory, slowness, concentration, and other tasks requiring mental focus.

While there are many potential causes of HIV-related brain disorders, including opportunistic infections and tumors, this treatment bulletin will specifically focus on a set of disorders known as HAND, or HIV-associated neurocognitive disorders.

## HAND

HAND is an umbrella definition that encompasses three separate disorders relating to HIV and cognitive impairment, ranging from mild (ANI) to more severe (HAD):

- Asymptomatic Neurocognitive Disorder (ANI)
- Mild Neurocognitive Disorder (MND)
- HIV Associated Dementia (HAD)

Recent estimates show that cognitive impairment affects a large number of HIV+ patients, from 15% up to 50%. However, the demographic of people living with HIV has changed in the last decade (e.g. larger populations of older PHAs) and with that there may be an increase in risk factors that have altered how many patients are affected with some degree of cognitive impairment.

### I. Causes

The cause of HAND remains unclear to researchers, but we do know that it is likely due to multiple factors including damage caused by the virus itself and the inflammation triggered by the body's defenses being on 'high alert' – the immune system remaining in a switched on state for a long period of time. HIV enters the central nervous system (CNS) shortly after initial infection and is able to establish infection within certain CNS cells.

### II. Symptoms

Many areas of cognition and behavior can be associated with HAND and the symptoms may vary from person to person. Symptoms usually develop slowly over a period of months or years. Features of HAND can include:

- Impaired attention and / or concentration
- Mental slowing
- Abnormal memory
- Slowed movements
- Poor physical coordination
- Personality change
- Irritability or agitation
- Apathy (lack of interest or concern)

*Asymptomatic Neurocognitive Disorder (ANI)* is the mildest form of HAND and occurs in about 30% of HIV-infected individuals. In ANI, there is impairment in at least 2 cognitive or behavioral abilities, such as learning and memory, but the impairment does not interfere with daily functioning and is not noticed by the individual (but is detected through screening)

*Mild Neurocognitive Disorder (MND)* is more advanced and is usually found in 20-30% of HIV+ individuals. As with ANI, there is impairment in at least 2 areas, and though mild, the symptoms are significant enough to cause some interference in daily functioning.

*HIV-Associated Dementia (HAD)* is the most severe form but also the least common. It is only found in 2-8% of HIV-infected individuals and is characterized by significant impairment in day-to-day functioning. The good news is that researchers have found a substantially lower rate of neurocognitive impairment in HAART

users with an undetectable viral load. In a recent study, only 2% of PHAs were diagnosed with HIV-Associated Dementia.

### III. Risk Factors

While there is still no definitive way to predict who will develop HAND, there are some factors that we know increase the chances of an HIV+ individual developing one of these cognitive disorders. Some risk factors and co-existing conditions that may increase the risk for HAND include:

- Older than 45 years
- Low nadir CD4 (lowest ever CD4 count)
- CD4 count falling below 200
- AIDS diagnosis
- Long-term HIV infection
- Anemia
- Insulin resistance, diabetes, or heart disease
- Hepatitis C virus co-infection
- Substantial substance or alcohol use (especially higher rates of stimulant use: cocaine and methamphetamines)

### IV. Diagnosis

PHAs often wonder, "Is it HIV or is it everything else?" The diagnosis of HAND can be difficult since it can share symptoms with other medical conditions. In order to be able to diagnose HAND, your doctor has to rule out other illness which can cause cognitive impairment such as depression, issues relating to age, opportunistic infections that affect the brain, and conditions such as diabetes and hepatitis C co-infection.

Your doctor might order an MRI to look for changes in the brain tissue or for other causes of cognitive impairment, check the fluid surrounding your spinal cord & brain (called cerebrospinal fluid, or CSF), and perform various neuropsychological assessments that will help them to rule out certain conditions and determine the presence, type, and severity of the impairment you may have.

### V. Treatment

Since HAND seems to be caused by persistent HIV infection in the central nervous system (CNS), currently the goal of treatment is to reduce the amount of HIV present both in the blood and the CNS as much as possible. We know that the virus can hide in reservoirs in the gut or brain, even when your blood viral load is undetectable. Luckily, with good adherence to medication, you can protect your brain and CNS against HAND.

A feature of the CNS known as blood brain barrier (BBB) makes the task of getting medication to the CNS a particular challenge. The BBB is a physical barrier that acts as a protective mechanism to keep substances that can damage the brain from being able entering it, and so treating brain disorders and infections is always a challenge since medication has to be designed that can penetrate this barrier.

In order to suppress HIV in the CNS, BBB penetration by anti-retroviral medication is critical. There are several anti-retroviral medications available that studies have shown have very good penetration into the brain (e.g. lopinavir/r, abacavir, zidovudine, nevirapine, and others). These drugs have also been shown to have possible positive effects on cognitive functioning. New drugs that penetrate the BBB and may be beneficial in treating HAND are currently in development.

#### Anti-Retroviral Therapy Neurotoxicity

Even though treatment regimens that penetrate the CNS have been shown to improve cognitive impairment, there is some evidence that they may have toxic effects on the CNS, which negatively affects cognition. More research needs to be conducted, but there may be both positive and negative aspects in the use of HIV medications that penetrate the CNS.

## Strategies for coping with HAND

HAND is important to address with your doctor, especially if you find that it is affecting your quality of life. It can interfere with your ability to take your medication, being able to manage day-to-day tasks such as shopping, preparing meals, managing your finances, and even driving.

While HAND isn't preventable, taking a medication regimen that penetrates the CNS and ensuring you are taking the medication as prescribed can help to lessen the symptoms and delay its progression.

There is a lot that you can do to increase your resilience if you are coping with a cognitive impairment - below are some tips and strategies that may help to manage your daily tasks. From setting reminder alarms, to having friends and family help you, you don't have to cope alone.

### *Tips for coping with cognitive impairment*

- Organize your space in a way so that things are easy to find
- Perform tasks that require more effort and concentration at times when you feel best. This may be first thing in the morning, on weekends, or may change day to day.
- Keep a day-timer or appointment book to keep track of all of your commitments and tasks. To-do lists can be very helpful in keeping you on track of all of your daily activities.
- Keep up with your medical appointments – your doctor can be your best ally in helping you treat any cognitive impairment you may be experiencing and may be able to connect you with additional support and resources
- Take all of your medication as prescribed. If you are on an anti-retroviral regimen adherence is especially important to help prevent your HIV from becoming resistant to the medication.
- Avoid using alcohol or other substances as a coping mechanism – it can worsen the cognitive impairment or interact with medications you are taking and while it may provide a distraction, its effects are only temporary.
  - Don't be afraid to ask for help and support when you need it.
- Keep up with the activities you enjoy, social contacts, and have fun! It will keep you engaged and enjoying life.
  - Take mental breaks when you need them, especially after particularly challenging tasks

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## Mission

The Toronto People With AIDS Foundation exists to promote the health and well-being of all people living with HIV/AIDS by providing accessible, direct, and practical support services