DRUG ABUSE AND AUTOIMMUNE DISEASE

The role of recreational drugs in autoimmune disease

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Recreational drugs, such as cocaine, amphetamine, marijuana, and heroin have all been implicated in autoimmune disease development and progression.

The Connection

Several recreational drugs, including methamphetamine, heroin, and cocaine are associated with the development of autoimmune disorders. In general, recreational drugs, as well as the fillers they're suspended in and the impurities derived during their preparation, can trigger autoimmune responses. Some of the more common consequences of recreational drug abuse include autoimmune thyroid disease and scleroderma in cocaine abuse, arthritis and neurologic changes in heroin abuse, and the vascular disorder panarteritis seen in methamphetamine abuse.

Environmental Toxins

To the immune system, recreational drugs act as environmental toxins, stressing and injuring immune system cells. The abuse of heroin, an opiate narcotic that's metabolized into morphine, is associated with the development of several different autoantibodies and several different autoimmune disorders.

Associated Autoantibodies

Autoantibodies seen in persons known to abuse heroin include rheumatoid factor (RF), antineutrophilic cytoplasmic antibodies (ANCA), anticardiolipin antibodies, antinuclear antibodies (ANA), smooth-muscle antibodies, and antibodies to brain tissue and other central nervous system components. In heroin addicts, the ANA include double-stranded DNA (ds-DNA) antibodies, single-stranded DNA (ss-DNA) antibodies, Sm, RNP and La antibodies. The consequences of these autoantibodies include systemic rheumatological diseases such as arthritis, deep vein thrombosis, Guillain-Barre syndrome, musculoskeletal disease, dementia and other related neurologic changes related to cerebral atrophy.

Antibodies to brain antigens S100, neuron specific enolase (NSE), and myelin basic protein (MBP) are seen in patients who abuse heroin. In one study, up to 68 percent of people abusing heroin had antibodies to S100 and up to 56 percent had antibodies to NSE. The brain-associated autoimmune phenomena seen in heroin abuse are suspected of precipitating and worsening the dementia seen in the late stages of AIDS. The brain's response to these antibodies also causes a hyperimmune phase that precedes
immunodeficiency and leads to an accelerated progression of AIDS. Cerebral (brain) atrophy can occur as a consequence of alcohol abuse, cannabinoid (marijuana) intoxication, and heroin abuse.

**Heroin and Cocaine**

The first signs of paralysis in the autoimmune disorder Guillain-Barre syndrome have been reported to occur within several hours of heroin injection. Symptoms can progress to total paralysis and coma. Even after recovery, patients may have peripheral muscular and facial weakness affecting one side of the face similar to that seen after strokes.

The effects of heroin have been studied the most. Some of heroin's studied effects are related to the intravenous or injecting mode of transmission. Foreign substances injected directly into the bloodstream have more of a potential to affect multiple organs and systems than drugs ingested orally. Cardiac complications, including autoimmune inflammatory cardiac disease, are more likely to occur in people abusing drugs intravenously.

There have also been reports of the autoimmune kidney disorder Waldenstrom's macroglobulinemia occurring in people with a history of intravenous heroin abuse and cocaine use. Although some of these patients also had hepatitis C, this seems to be a coincidental rather than causative occurrence. Today, intravenous drug abuse is the most common cause of hepatitis C in the United States. Among patients abusing drugs who developed autoimmune diseases, more incidences of viral hepatitis and human immune deficiency virus (HIV) infection were seen than in the general population.

**Resources:**

Milena Nikolova, Mila Liubmirova, Clinical significance of Antinuclear Antibodies, Anti-neutrophil Cytoplasmic Antibodies (ANCA) and Anticardioliopin Antibodies in Heroin Abusers.


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