

Letters to the Editor

Commentary on "Evaluation of Canines for Accelerant Detection at Fire Scenes" (J Forensic Sci 1994 Nov; 39(6):1528-1536)—sensitivity vs. specificity

Sir:

This letter is not directed to the reference article per se. That article stands on its own. Rather we write in response to the sentence "This later claim seems to be a point of contention among investigators and forensic scientists." The claim is that dogs are more sensitive than the laboratory gas chromatograph (GC). We agree this is a point of contention; an unfortunate point of contention. Forensic scientists and arson investigators are both after the same thing—fighting the arson problem. And, the sensitivity argument ignores what we believe to be the real question. The real question is one of selectivity. Can a particular accelerant-detecting dog discriminate between accelerants and pyrolysis products? Can a particular laboratory instrument discriminate between accelerants and pyrolysis products?

It has been our experience that some dogs are better than others at discriminating between accelerants and pyrolysis products. It is also our experience that even the best dogs sometimes hit on pyrolysis products. We have no hard empirical data, but the belief among some laboratory people and dog handlers is that if the dog can't find anything else it may respond to pyrolysis products. Note: All of the dogs with which we are familiar are food-reward dogs. If the dogs do not find anything, they do not get fed.

Selectivity is also important to the laboratory. Many times the chromatogram of an arson sample is so confused with pyrolysis products that any accelerant present is lost in the background. If the laboratory can't find the accelerant (discriminate between the accelerant and the pyrolysis products), then all the sensitivity in the world is worthless. It has been our experience that the flame ionization detector (FID) clearly fails in this regard. Small amounts of accelerants can not be detected in the presence of large amounts of pyrolysis products if an FID has been used. But in many cases small amounts of accelerants can be detected if a mass spectrometer has been used as a detector. Ion profiling can separate accelerants from pyrolysis background (1,2). We believe that laboratories who work with accelerant-detecting dogs (actually any laboratory that analyzes arson debris) must have, or have access to, a gas chromatograph with a mass spectrometer or mass selective detector. A laboratory that uses only GC/FID, is going to miss accelerants when they are in the presence of large amounts of pyrolysis products. If the samples have been submitted by a dog handler, reporting these samples negative or inconclusive will increase the frustration level between the laboratory and the handler. The result will be handlers and forensic scientists continuing to disagree with each other.

Accelerant-detecting dogs are valuable additions to the crime fighting arsenal. Arson investigators have responded to the challenges of their profession by incorporating dogs into their investigating routine. Forensic scientists can do no less than analyze samples with the most appropriate equipment.

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Commentary on Leong GB and Silva JA. A Psychiatric-Legal Analysis of Psychotic Criminal Defendants Charged With Murder (J Forensic Sci 1995;40(3):445-448)

Sir:

An interesting, future direction for research, germane to the valuable data presented by Leong and Silva (1), pertains to anabolic-androgenic steroid use and psychiatric-related effects, including psychotic symptoms, and possible, resultant criminal behavior.

Although the body of research data pertinent to psychiatric-related effects associated possibly with anabolic-androgenic steroid use is still in a rudimentary stage of development, it is suspected that the use of anabolic-androgenic steroids may be associated with severe behavioral changes and adverse psychiatric effects resulting, in some instances, in criminal and violent behavior. There have been, in any event, several court cases in which persons abusing anabolic-androgenic steroids have allegedly perpetrated violent crimes.

Published data relating to anabolic-androgenic steroids and psychiatric-related effects have been reviewed (2). The reviewed data indicate that various psychotic symptoms may be associated with anabolic-androgenic steroids. Study subjects have met criteria for psychotic symptoms during periods of anabolic-androgenic steroid use, including: paranoid delusions, delusions of reference and auditory hallucinations of voices. Some study subjects have also reported manic episodes, while using anabolic-androgenic steroids. In another vein, the reviewed data showed that there may be a positive association between testosterone levels and aggression, particularly aggression in response to provocation. Other tentacles of psychiatric effects of anabolic-androgenic steroids extend potentially to: depression; libido; and hypomania. As the review article

notes, however, the slowly-accumulating body of data on anabolic-androgenic steroids and psychiatric effects is sparse, and the little, available data are often inconsistent and inconclusive (2). There is, in sum, a salient need for significant, further research intended to elucidate possible relationships between anabolic-androgenic steroids and psychiatric-related effects, including psychotic symptoms. Such data may be valuable, in part, in the psychiatric-legal analysis of persons alleged to have engaged in criminal and violent conduct. This type of analysis is especially indicated in light of the fact that anabolic-androgenic steroids have been popular with athletes for decades (3); and, overall, an estimated 1 million persons now use anabolic-androgenic steroids (4).

A research concern, in the area of anabolic-androgenic steroids, is that athletes may often use anabolic-androgenic steroids at dose levels substantially in excess of therapeutic dose levels. It would be unethical, however, for investigators in an academic study to administer similarly-high doses of anabolic-androgenic steroids to healthy subjects (2).

The work of Leong and Silva (1), in analyzing from a psychiatric-legal perspective psychotic criminals charged with murder, is a good starting point. But much more work needs to be done in order to determine possible relationships between substance abuse, including the use of anabolic-androgenic steroids, psychotic symptoms and other psychiatric effects, and violent criminal behavior.

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Authors' Response

Sir:

We share Leo Uzych's concern that the use of anabolic-androgenic steroids could heighten a person's potential for violence. Besides his comprehensive work, there has been other research documenting neuropsychiatric effects of these steroids (1-3) as well as a hypothesized connection to homicidal behavior (4). It is also important to emphasize that the evaluation of substance-induced aggression not infrequently fails to take into consideration the abuse of steroid compounds despite its increasing usage. Further, we also concur with the view that psychosis secondary to these steroids is not presently well understood. Nonetheless, additional study of the phenomenology of steroid-induced mental changes may improve our understanding of the association between the use of anabolic-androgenic steroids and aggressive behaviors.

From a public health perspective, we believe that primary prevention efforts aimed at substance use is a key component in the reduction of homicidal behavior, including those directed at reducing the non-medical use of anabolic-androgenic steroids.

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