NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

April 8, 2020

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Chief Medical Officer

A. ACCIDENT: ERA19FA256; Minneola, FL

On August 22, 2019, about 1115 eastern daylight time, an experimental amateur-built Aventura II, N9143M, was substantially damaged by impact with terrain shortly after takeoff from Florida Flying Gators Ultralight Flightpark (3FD4), Minneola, Florida. The private pilot was fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the personal flight that was destined for Deland Municipal Airport-Sidney H Taylor Field (DED), Deland, Florida. The airplane was owned and operated by the pilot under the provisions of Title 14 Code of Federal Regulations Part 91.

B. GROUP IDENTIFICATION

No group was formed for the medical evaluation in this accident.

C. DETAILS OF INVESTIGATION

1. Purpose

   This investigation was performed to evaluate the pilot for medical conditions, the use of medications/illicit drugs, and the presence of toxins.

2. Methods

   The FAA medical case review, autopsy report, toxicology findings, and the investigator's reports were reviewed. Relevant regulation and medical literature were reviewed as appropriate.

   FAA Medical Case Review

   According to the FAA medical case review, the 63 year old male pilot reported 306 total flight hours as of his last exam, dated 10/15/2018. At that time he was 70 inches tall and weighed 160 pounds. He had reported no chronic medical conditions and no use of medications to the FAA. He

was issued a third class medical certificate limited by a requirement he wear corrective lenses for distant vision and have glasses for near vision.

Autopsy

According to the autopsy performed by the State of Florida Medical Examiner, Districts 5 & 24, the cause of death was multiple blunt force injuries and the manner of death was accident. No significant natural disease was identified.

Toxicology

Toxicology testing performed at the request of the medical examiner by NMS Labs identified 5.8 ng/ml of Delta-9 THC (tetrahydrocannabinol, the active compound in marijuana) and 15 ng/ml of its inactive metabolite, Delta-9-carboxy THC in iliac blood.

Toxicology testing performed by the FAA's Forensic Science Laboratory identified Delta-9-THC at 7.4 ng/mL in cavity blood, along with 16.4 ng/mL of Delta-9 Carboxy-THC and 0.9 ng/ml of 11-Hydroxy-Delta-9-THC (a psychoactive metabolite). In addition, 3 ng/g of Delta-9-THC was identified in liver tissue, along with 107.8 ng/ml of Delta-9 Carboxy-THC. Testing for 11-Hydroxy-Delta-9-THC was inconclusive in liver.

Drug Description

Delta-9-THC has mood altering effects including inducing euphoria and relaxation. In addition, marijuana causes alterations in motor behavior, perception, cognition, memory, learning, endocrine function, food intake, and regulation of body temperature. Specific performance effects include decreased ability to concentrate and maintain attention, impairment of hand-eye coordination is dose-related over a wide range of dosages. Impairment in retention time and tracking, subjective sleepiness, distortion of time and distance, vigilance, and loss of coordination in divided attention tasks have been reported.

Marijuana has been demonstrated to have clinical effects at levels as low as 0.001 ug/ml.[1] While significant performance impairments are usually observed for at least 1-2 hours following marijuana use, and residual effects have been reported up to 24 hours, even when the blood level is undetectable.[2] Finally, the pattern and frequency of use effect levels in blood and various tissues.

[1] Federal Aviation Administration. Civil Aerospace Medical Institute Toxicology Drug Information: Marijuana http://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=154 Accessed 1/28/2020.
[2] National Highway Traffic Safety Administration. Drugs and Human Performance Fact Sheets. Cannabis/Marijuana. https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/809725-drugshumanperformfs.pdf Accessed 1/14/2020.

Delta-9-THC typically peak while smoking, while peak concentrations of Delta-9-carboxy THC occur approximately 9-23 minutes after the start of smoking. Concentrations of both analytes decline rapidly and are often < 5 ng/mL at 3 hours. Chronic users can have mean plasma levels of Delta-9-carboxy THC of 4.5 ng/mL, 12 hours after use; corresponding Delta-9-THC levels are, however, less than 1 ng/mL.[2]

D. SUMMARY OF MEDICAL FINDINGS

The 63 year old male pilot had reported 306 total flight hours to the FAA but had reported no chronic medical conditions and no use of medications to the FAA.

According to the autopsy performed by the State of Florida Medical Examiner, Districts 5 & 24, the cause of death was multiple blunt force injuries and the manner of death was accident. No significant natural disease was identified.

Toxicology testing performed at the request of the medical examiner by NMS Labs identified 5.8 ng/ml of Delta-9 THC (tetrahydrocannabinol, the active compound in marijuana) and 15 ng/ml of its inactive metabolite, Delta-9-carboxy THC in iliac blood.

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