NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

April 9, 2020

Mary Pat McKay, MD, MPH
Chief Medical Officer

A. ACCIDENT: WPR19MA177; Mokuleia, HI

On June 21, 2019, at 1822 Hawaii-Aleutian standard time, a Beech 65-A90, N256TA, collided with terrain after takeoff from Dillingham Airfield (HDH), Mokuleia, Hawaii. The commercial pilot and ten passengers sustained fatal injuries, and the airplane was destroyed. The airplane was owned by N80896 LLC, and was being operated by Oahu Parachute Center (OPC) under the provisions of Title 14 Code of Federal Regulations Part 91 as a local sky-diving flight. Visual meteorological conditions prevailed, and no flight plan had been filed.

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. In addition, the toxicology reports for five private contractors hired by the operator, two cameramen and three tandem instructors (each jumping with a passenger) as well as the passengers were reviewed.

2. Methods

   The pilot's FAA medical case review, FAA blue ribbon medical file, autopsy report, toxicology findings for three people, and the investigator's reports were reviewed. No personal medical records for the pilot were available as family did not know of any personal healthcare providers for him. Relevant regulation and medical literature were reviewed as appropriate.

Pilot

FAA Medical Case Review and Blue Ribbon Medical File

According to the FAA medical data, the 42 year old male pilot had reported 750 civilian flight hours as of his last medical examination, dated 11/1/2018. At that time the pilot was 65 inches tall and weighed 124 pounds. He reported no chronic medical conditions and no use of medications but did report having had LASIK eye surgery in 2012. No significant abnormalities were identified on the physical exam and the pilot was issued a second class medical certificate without limitations.

Autopsy

According to the autopsy performed by the Department of the Medical Examiner, City and County of Honolulu, the cause of death was multiple blunt force injuries and the manner of death was accident. The brain and heart were not available for examination, due to the extent of injury. No significant natural disease was identified.

Toxicology

Toxicology testing performed by the FAA's Forensic Science Laboratory identified ethanol at 0.013 gm/hg in kidney but no ethanol in muscle. At the request of the medical examiner, NMS Labs tested a different sample of muscle and identified ethanol at 0.086 gm/hg.[1]

Description of Ethanol

Ethanol is the intoxicant commonly found in beer, wine, and liquor. It acts as a central nervous system depressant. After ingestion, at low doses, it impairs judgment, psychomotor functioning, and vigilance; at higher doses it can cause coma and death. The effects of ethanol on aviators are generally well understood; it significantly impairs pilots' performance, even at very low levels. Federal Aviation Regulations, Section 91.17 (a) prohibits any person from acting or attempting to act as a crewmember of a civil aircraft while having 0.040 gm/dL or more ethanol in the blood. After absorption, ethanol is quickly distributed throughout the body's tissues and fluids fairly uniformly. Ethanol may also be produced in the body after death by microbial activity; in this case, levels may vary widely among specimens.[2]

Cameraman (1)[3]

Toxicology

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[1] Gm/hg indicates the sample was initially a solid. These and values in mg/gm compare directly with gm/dl for blood levels of ethanol.

[2] Federal Aviation Administration. Forensic Toxicology Drug Information. Ethanol. http://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=60 Accessed 03/02/2015

[3] Occupant numbering is simply to differentiate the individuals.

At the request of the medical examiner, toxicology testing was performed on femoral blood for the 29 year old male cameraman by NMS Labs. The testing identified 32 ng/ml of Delta-9-tetrahydrocannabinal (THC, the main psychoactive compound in marijuana) along with 64 ng/ml of Delta-9-carboxy THC (THC-COOH, an inactive metabolite) and 7.7 ng/ml of 11-hydroxy-delta-9 THC (11-OH-THC, an active metabolite).

Cameraman (2)

At the request of the medical examiner, toxicology testing was performed on cavity blood for the 32 year old male cameraman by NMS Labs. It did not identify any tested-for substances. Ethanol testing of cavity blood by the Department of the Medical examiner found 0.056 gm/dl. This was the only specimen tested for ethanol.

Tandem Instructor (1)

Toxicology

NMS Labs tested liver tissue in the 35 year old male tandem instructor on the airplane, who had been paired with a passenger. No blood specimens were available for testing. Results demonstrated caffeine (the stimulant in coffee, tea, and sodas), THC at 22 ng/gm, THC-COOH at 850 ng/gm, and 11-OH-THC at 11 ng/gm.

Description of THC and Metabolites

THC's mood-altering effects include 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 in retention time and tracking, subjective sleepiness, distortion of time and distance, vigilance, and loss of coordination in divided attention tasks have been reported. 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. THC concentrations typically peak during the act of smoking, while peak 11-OH THC concentrations occur approximately 9-23 minutes after the start of smoking. Peak plasma THC concentrations ranged from 0.046-0.188 ug/mL in 6 subjects after they smoked 8.8 mg THC over 10 minutes. Concentrations of both analytes decline rapidly and are often less than 5 ng/mL at 3 hours.[4]

Tandem instructor (2)

Toxicology testing was performed on the 48 year old male tandem instructor by NMS labs. Results identified 0.130 mg/gm of ethanol in the single tissue tested, muscle tissue.

[4] 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 3/27/2020.

Tandem instructor (3)

Toxicology testing of the 50 year old tandem instructor's available muscle tissue by NMS lab identified caffeine, the stimulant found in tea, coffee, and some sodas, beta-phenethylamine, a production of decomposition, and ethanol at 0.130 mg/gm. This was the only specimen tested.

Solo Jumper (1)

Toxicology testing was performed on the 23 year old male solo jumper by NMS labs. Results from cavity blood identified 0.038 gm/dl of ethanol and the presence of caffeine, the stimulant found in tea, coffee, and some sodas. This was the only specimen tested for ethanol.

Solo Jumper (2)

Toxicology testing was performed on the 27 year old male solo jumper by NMS labs. Results from cavity blood identified the presence of caffeine, the stimulant found in tea, coffee, and some sodas.

Tandem Passenger (1)

Toxicology testing was performed on the 26 year old female tandem passenger by NMS labs. Results from cavity blood identified the presence of caffeine, the stimulant found in tea, coffee, and some sodas.

Tandem Passenger (2)

Toxicology testing was performed on the 27 year old male tandem passenger by NMS labs. Results from liver tissue identified the presence beta-phenylethylamine, a common product of decomposition.

Tandem Passenger (3)

Toxicology testing was performed on the 27 year old male tandem passenger by NMS labs. Results from liver tissue (the only tissue tested) identified the presence of 0.310 mg/g of ethanol.

D. SUMMARY OF MEDICAL FINDINGS

Pilot

The 42 year old male pilot had no reported chronic medical conditions and no use of medications to the FAA. No personal healthcare visits were reported by family.

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