NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

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Mary Pat McKay, MD, MPH
Chief Medical Officer

A. ACCIDENT: CEN17FA270; Cummings, KS

On July 16, 2017, about 1020 central daylight time, a North American Aero Classics P-51 D airplane, N251PW, was destroyed when it impacted trees and terrain 2.5 miles northeast of Cummings, Kansas. The airline transport pilot and passenger were fatally injured. The airplane was destroyed. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no Federal Aviation Administration (FAA) flight plan had been filed for the flight. The local flight departed the Amelia Earhart Airport (K59), Atchison, Kansas, about 1005.

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 any medical conditions, the use of any medications/illicit drugs, and the presence of any toxins.

2. Methods

   The FAA medical case review, autopsy reports, toxicology findings, and the investigator's reports were reviewed.

Pilot

FAA Medical Case Review

According to the FAA medical case review, the 64 year old male pilot had reported 11,500 total hours of flight experience as of his last aviation medical exam, dated 5/22/2017. At that time, he was 73 inches tall and weighed 259 pounds. Over the years, the pilot had reported having type 2

diabetes, hypertension, and high cholesterol as well as having had cataract surgery to the FAA. At the time of his last exam, he reported using glimepiride (also called Amaryl), metformin (also called Glucophage), and pioglitazone (also called Actos) to treat his diabetes; losartan and hydrochlorothiazide (also called Hyzaar) to treat his high blood pressure, and atorvastatin (also called Lipitor) to treat his high cholesterol. [1,2,3,4,5] None of these medications are generally considered impairing. No significant abnormalities were noted on the physical exam and his most recent hemoglobin A1C was 6.1%, indicating good control of his glucose. He was issued a special issuance second class medical certificate limited by a requirement to possess glasses for near and intermediate vision.

Autopsy

According to the autopsy performed by Frontier Forensics Midwest, LLC, the cause of death was blunt traumatic injuries. The brain was not examined, due to the extent of injury. The heart was fragmented and reported as weighing 220 grams with mild atherosclerosis, but they were "severely lacerated." Average weight for a 260 pound man is 425 grams with a range of 322 to 561 grams.[6] Microscopy demonstrated focal hypertrophic cardiac myocytes and a focal healed endomyocardial scar.

Toxicology

Toxicology testing performed by the FAA's Bioaeronautical Sciences Research Laboratory identified 0.054 gm/hg of ethanol in liver and 0.010 gm/hg in muscle.[7] In addition, atorvastatin was identified in liver and lung tissue and losartan was found in liver tissue.

Ethanol, the alcohol found in beer, wine, and liquor, is primarily a social drug with a powerful central nervous system depressant. After ingestion, at low doses, it impairs judgment, psychomotor functioning, and vigilance;

[1] National Institutes of Health. US National Library of Medicine. DailyMed. Glimepiride. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=60e9397e-83b9-489e-9683-6f87e458bbaa Accessed 6/6/2018.
[2] National Institutes of Health. US National Library of Medicine. DailyMed. Metformin. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=2d98aea3-35ba-447a-b88f-a5a20b612b2f Accessed 6/6/2018.
[3] National Institutes of Health. US National Library of Medicine. DailyMed. Pioglitazone. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=8f2d7000-37ca-4e09-98ec-07d1c0354cb3 Accessed 6/6/2018.
[4] National Institutes of Health. US National Library of Medicine. DailyMed. Hyzaar. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=d3e434b9-2f56-4dec-8cbf-a61e23abcc6a Accessed 6/6/2018.
[5] National Institutes of Health. US National Library of Medicine. DailyMed. Atorvastatin. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=6ccdb6f3-22c7-5b48-46bc-ce4a4c65eb4d Accessed 6/6/2018.
[6] Kitzman DW, Scholz DG, Hagen PT, Ilstrup DM, Edwards WD. Age-related changes in normal human hearts during the first 10 decades of life. Part II (Maturity): A quantitative anatomic study of 765 specimens from subjects 20 to 99 years old. Mayo Clinic Proc., 1988. 63(2):137-46.
[7] This is equivalent to gm/dl in blood.

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.[8] 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.[9]

After ingestion, ethanol is quickly distributed throughout the body's tissues and fluids fairly uniformly. The distribution pattern parallels the water content and blood supply of each organ. Ethanol may also be produced in the body after death by microbial activity.[10]
Atorvastatin and losartan are described above.

Pilot Rated Passenger

FAA Medical Case Review
According to the FAA medical case review, the 34 year old female pilot had reported 2000 total hours of flight experience as of her last aviation medical exam, dated 12/09/2016.At that time, she was 65 inches tall and weighed 122 pounds. She had reported no medical conditions and no use of medications to the FAA. No significant abnormalities were noted on the physical exam. She was issued a second class medical certificate limited by a requirement to wear corrective lenses.

Autopsy
According to the autopsy performed by Frontier Forensics Midwest, LLC, the cause of death was blunt traumatic injuries. No significant natural disease was identified.

Toxicology
Toxicology testing performed by the FAA's Bioaeronautical Sciences Research Laboratory identified 0.035 gm/hg of ethanol in blood but no ethanol in liver or brain tissue.

D. SUMMARY OF MEDICAL FINDINGS

The 64 year old male pilot had longstanding diabetes, hypertension, and high cholesterol, which was controlled with medications. He had reported these conditions and their treatment to the FAA. According to the autopsy performed by Frontier Forensics Midwest, LLC, the cause of death was blunt traumatic injuries. The autopsy was limited by the severity of damage but revealed coronary artery disease described as "mild" and focal hypertrophic cardiac myocytes and a focal healed endomyocardial scar by

[8] Cook, C.C., Alcohol and aviation. Addiction (Abingdon, England), 1997. 92(5): p. 539-555.
[9] US Government Printing Office .eCFR- Code of Federal Regulations. 91.17. Accessed 6/16/2015. Available from: http://www.ecfr.gov/cgi-bin/text-idx?rgn=div8&node=14:2.0.1.3.10.1.4.9.
[10] Federal Aviation Administration. Forensic Toxicology Drug Information. Ethanol. http://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=60 Accessed 03/02/2018.

microscopy. Toxicology testing identified 0.054 gm/hg of ethanol in liver and 0.010 gm/hg in muscle. In addition, atorvastatin was identified in liver and lung tissue and losartan was found in liver tissue. These drugs had been reported to the FAA and are not considered impairing.

The 34 year old female pilot had reported no medical conditions and no medication use to the FAA. According to the autopsy performed by Frontier Forensics Midwest, LLC, the cause of death was blunt traumatic injuries. No significant natural disease was identified. Toxicology testing performed identified 0.035 gm/hg of ethanol in blood but no ethanol in liver or brain tissue.