



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

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Chief Medical Officer

A. ACCIDENT: ERA14FA313, Littleton, NC

On June 27, 2014, about 0940 eastern daylight time, a Cessna 182Q, N182PE, was substantially damaged during a forced landing near Littleton, North Carolina. The commercial pilot was fatally injured. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the flight, which departed from Sabot Airport (1VA0), Sabot, Virginia, at 0848, and was destined for Rocky Mount-Wilson Regional Airport (RWI), Rocky Mount, North Carolina. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. According to air traffic control (ATC) voice and radar data provided by the Federal Aviation Administration (FAA), the airplane departed from 1VA0 and climbed to 4,000 feet. About 0929, the pilot advised ATC of equipment issues and requested a diversion to Hanover County Municipal Airport (OFP), Ashland, Virginia. About 5 minutes later, the pilot reported an engine issue and requested another diversion to Halifax-Northampton Regional Airport (IXA), Roanoke Rapids, North Carolina. Shortly thereafter, the pilot advised the controller that he would not be able to make the field. No further communications were received and the airplane was located by first responders about 1050.

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 F, FAA medical case review, toxicology results, autopsy report, and the investigator's reports were reviewed.

FAA Medical Case Review

According to the FAA medical case review, the pilot was 71-year-old male who reported 2721 total flight hours as of his last medical exam, dated 6/03/2014. At that time, he was 75 inches tall, weighed 277 pounds, and reported having hay fever/allergies. In addition, he reported the following medications: allopurinol, metronidazole, indomethacin, tadalafil, sildenafil, celecoxib, and desoximetasone.

Allopurinol is a prescription medication also named Zyloprim and typically used to treat gout.¹ Metronidazole is a prescription antibiotic.² Indomethacin is a prescription non-steroidal anti-inflammatory analgesic, also known as Indocin and Tivorbex.³ Celecoxib is also a prescription non-steroidal anti-inflammatory analgesic, often marketed with the name Celebrex.⁴ Tadalafil and sildenafil are prescription drugs used to treat erectile dysfunction; tadalafil is also used to treat symptoms from an enlarged prostate.^{5,6} These drugs are also known as Cialis and Viagra, respectively. Desoximetasone is a topical steroid used to treat a variety of rashes.⁷ No specific diagnoses conforming to these medications are reported in the medical case review. The pilot was issued a second class medical certificate limited by a requirement to wear corrective lenses on 6/03/2014.

Autopsy

According to the autopsy performed by the Brody School of Medicine at East Carolina University, Division of Forensic Pathology, the cause of death was consequences of fracture of cervical spine due to aircraft crash. In addition to his injuries, significant heart disease was identified. The heart weighed 470 grams; average for a 278 pound man is 439 grams with a range of 333- 580 grams.⁸ The pathologist commented that the heart was enlarged. The coronary arteries had atherosclerotic narrowing including 30% in the left main, 10% in the left anterior descending and circumflex, and a focal stenosis of 90% in the right coronary. The myocardium was described as red-brown with slight pallor in the subendocardium of the posterior left ventricle. No other focal lesions were seen; the right free wall measured 0.5 cm and the left was 1.6 cm (average is less and 1.3 cm⁸). On microscopy of heart tissue, mild autolysis and mild perivascular interstitial fibrosis was seen in all sections. The fibrosis was focally moderate at tip of anterior papillary muscle and in one of two sections of posterior papillary muscle.

Toxicology

Toxicology testing performed by the FAA's Bioaeronautical Research Laboratory identified 0.26 ug/ml of diphenhydramine in the pilot's aortic

blood and diphenhydramine and indomethacin in urine. Indomethacin is described above and was not identified in blood. No ethanol and no other tested for drugs were found.

Diphenhydramine is a sedating antihistamine available over the counter in many formulations used to treat cold and allergy symptoms and as a sleep aid. It is marketed under many names including Benadryl and Unisom. Therapeutic drug levels are considered between 0.0250 ug/ml and 0.1120 ug/ml. Diphenhydramine carries the following FDA warning: may impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g., driving, operating heavy machinery).⁹ Compared to other antihistamines, diphenhydramine causes marked sedation. As a result, it is also classified as a CNS depressant and this is the rationale for its use as a sleep aid. Altered mood and impaired cognitive and psychomotor performance have been observed.¹⁰ In fact, in a driving simulator study, a single dose of diphenhydramine impaired driving ability more than a blood alcohol concentration of 0.100%.¹¹

D. SUMMARY OF MEDICAL FINDINGS

The 71 year old male pilot in this accident had reported having hay fever/allergies to the FAA and reported using the medications allopurinol, metronidazole, indomethacin, tadalafil, sildenafil, celecoxib, and desoximetasone. The autopsy found the cause of death was fracture of cervical spine due to aircraft crash. In addition, it identified enlargement of the heart with thickening of the left ventricle and coronary artery disease with 90% stenosis in the right coronary artery. Post accident toxicology testing identified 0.26 ug/ml of diphenhydramine in the pilot's aortic blood and diphenhydramine and indomethacin in urine.

References

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- ⁹ Federal Aviation Administration. Civil Aerospace Medical Institute. Toxicology Drug Information: Diphenhydramine. Available from: <http://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=50> . Accessed 3/16/2016.
- ¹⁰ National Highway Traffic Safety Administration. Drugs and Human Performance Fact Sheets: Diphenhydramine. <http://www.nhtsa.gov/people/injury/research/job185drugs/diphenhydramine.htm>. Accessed 3/15/2016.
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