

Dec. 10, 1999 Minutes Lightning Data Center St. Anthony Hospital

Quote of the Month:

"Thagard quotes Einstein to the effect that 'everything should be as simple as possible but not simpler.' "

J.D. Howell, Book Review - How Scientists Explain Disease. NEJM 1999

1. Meeting began at 11:30 am and adjourned at 1:15 pm.
2. Members present: Cherington, Glancy, Gray, Kamin, Keen, M Kummerfeldt, P Kummerfeldt, Olson, Simmons, Vellman, Yarnell.
3. I brought the following articles from the literature (abstracted in part here):

- a. a. Rai, J, Jeschke, MG, Barrow RE, Herndon DN. Electrical injuries: a 30-yr review. J Trauma 1999;46:933- 336.

"Electrical injuries can be divided into <1000 V (low-voltage burns) and >1000 (high-voltage burns). Low-voltage burns are usually caused by children inserting metallic objects into electrical sockets or biting electrical wires. High-voltage injuries generally occur in children playing near high-voltage power lines...High-voltage contact can lead to necrosis of muscle, bone, and nervous tissue because it develops intense heat in bone, which is a poor conductor. A cutaneous burn can also occur...This type of damage subsequently requires fasciotomies, extensive debridement, and early amputation...From 1967 to 1997, 185 children admitted to {Shriners} Hospital were identified with electrical burns...Thirty-three percent of high-voltage burns required amputation...No mortalities were reported."

- b. Tiwari Vk, Sharma D. Kite flying: a unique but dangerous mode of electrical injury in children. Burns 1999;25:537-9.

"Six patients were included in the study with ages varying from 6 to 11 years...In the first two cases current passed directly through the string of kite, which was wet due to rain showers..when the kite got entangled in the electrical wires."

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Phil Yarnell and Sheryl Olson presented lightning cases for the group to hear and provide input. The two cases are described below in paragraph numbers 4 and 5.

4. Phil Yarnell invited a patient to tell the group about his experience with lightning. The patient is a 48 year old flight attendant with 24 years of experience in his job. On June 1 his flight on a 777 type plane was delayed for 2 hours at Chicago's O'Hare Airport because of bad weather and lightning. Finally, the plane took off with the patient seated in the back left side of the plane in seat 4-L. Seven or 8 minutes after take-off he heard a "loud boom" and saw a flash on the left wing. He experienced a "weird, butterfly feeling." The phone above his seat rang, and the flight attendant seated in the front of the airplane, facing him, asked: "Are you all right?" She reportedly saw "sparkles" and a "gold and blue fireball" emanating from the patients body. No one else on the plane suffered any effects of this event. People did notice and "acrid smell" in the cabin of the plane. {Warren Simmons speculated that the smell might have been ozone.}

He did not suffer and skin burns. There was no damage to the seats or other interior parts of the plane.

Since that time he has had 4 persistent symptoms: headache, tinnitus, periods of memory loss, and numbness of the left upper arm. He stated that he very much would like to return to work, but that has not been possible. Prior to the event of June 1, he seldom had headaches or tinnitus. His hobbies include music and playing the guitar, and the tinnitus has been a major problem.

Brain MRI has periventricular areas that some have suggested as consistent with demyelination. Phil Yarnell and I mentioned that this is the third patient we know about with a history of lightning or electrical trauma and a similar abnormality on MRI. Peter Vellman pointed out that the patient's symptoms are similar to those of patients he has seen with traumatic brain injury.

The members present engaged in a long discussion about what might have happened in that plane. Bob Glancy asked if there might have been a defect in the "Faraday cage effect." Warren Simmons suggested that the patient was "energized" by sitting near a window that acted as a capacitor. {At last month's meeting, Leland Anderson spoke about the capacitor effect of the windows as playing a role in ball lightning seen on airplanes.}

The members thanked the patient very much for giving us his history. He stated he would ask the other flight attendant that witnessed the event to come to a future meeting with him and give her account of what she saw.

5. Sheryl Olson told us about a patient that suffered injuries from a lightning strike in July. He is a 42 year old man who was hiking on the Spanish Peaks south of Walsenberg, Colorado at about 3 pm when lightning struck. He was above timberline. He suffered burns on his abdomen and right ankle. His right hiking boot exploded. Sheryl brought photographs of the skin lesions and she brought the actual boot. There were no burns on the boot material. Warren suggested that the shoe exploded because of steam. The patient has recovered.
6. Peter Kummerfeldt brought a newspaper account of a man in Brazil who was struck by lightning while speaking on a cell phone outside. The members agreed that although cell phones are probably safe to use indoors as regards lightning strikes, they might pose a definite danger (as would other items) when used outside during a lightning storm. The cell phone could be the upward streamer being held near a person's head.
7. These minutes reflect the comments of the members present and do not represent official positions of LDC.
8. Next meeting: Friday January 14, 2000 at 11:30 am in the Main Auditorium of St. Anthony Central Hospital.

Happy Holidays and see you in the next Millennium!

Michael Cherington, MD  
Chair, LDC Scientific Committee