
A MYSTERIOUS CANCER CLUSTER (1999 – 2003) SHAKES UP FALLON, NEVADA

By Brandon Hockenberry, 2012 UNSOM student

With the Y2K scare over, 2000 started with excitement and anticipation in Nevada and Churchill County was no different. Little did its citizens know that events in 2000 would change their small town. Over that summer Nevada public health officials received notice of the town's five cases of childhood leukemia. This was much higher than the expected one case every five years based on the county's population. By January 2002 fifteen children who lived, or had lived, in Churchill County had been diagnosed with acute lymphoblastic leukemia (ALL). The state health department reported the leukemia cluster to the U.S. Center of Disease Control (CDC) and launched an investigation. The etiology was unknown and many hypotheses developed. The people of Fallon, which is the largest town in Churchill County, had mixed emotions and opinions. Some were convinced that the nearby Naval Air Station was leaking jet fuel into the water system. In

(continued on Page 3 Fallon)

A FUTURE NEVADA PATHOLOGIST'S MILITARY PRACTICE IN VIETNAM: A WINDOW IN TIME 1967-68

By Anton P. Sohn MD (Discharged Captain U.S. Army)

Note: This article is written in honor of my fellow doctors who served in Vietnam: Tom Brady, Treat Cafferata (deceased), Bill Dawson, Dick Ganchan, Bill Keller (deceased), Joe Smalley and Jim Fulpert (formerly from Carson City).

Most people do not recognize the need for a pathologist in a war zone. I am doing this review of my pathology practice in the US Army during the Vietnam (VN) war to give the reader insight into the causes of the deaths that are not battle related but are in the battlefield. I served in VN from mid-April 1967 to mid-April 1968 when I was discharged and moved to Reno. During a 36-week period (April 1967 to January 1968) I kept copies in my personal files of diagnoses and descriptions from 111 autopsies. This review is not meant to be a scientific study, but is a window in time. My autopsy documents and photographs are preserved in University of Nevada School of Medicine Library. These results have not been previously published.

While in VN, I was the chief pathologist at the



Soldier's boot who was struck by lightning

Ninth Medical Laboratory, the U.S. Army's reference laboratory for VN. The laboratory was housed in a five-story building on the outskirts of Saigon, approximately four miles from Ton So Nhut Air Base where the morgue was located. The morgue was primitive by U.S. standards. We had X-ray facilities, a photographer, and running water, but the sewer was an open field. There were 2 other pathologists in my office and the 3 of us equally shared the workload. We worked as a team and went to the morgue together and divided the work. As a result of this arrangement the numbers I present could be tripled, but the percentages would be about the same. Our daily work consisted of diagnosing surgical biopsies and performing autopsies. The surgical specimens came mostly from civilian hospitals, such as the Seventh Day Adventist Hospital in Saigon. Most US soldiers who required non-combat medical or surgical treatment were air-evacuated to Japan or the Philippines. There were other army pathologists in VN, but their work consisted of

managing clinical laboratories, reviewing blood tests, overseeing transfusion services, but not performing autopsies or diagnosing surgical tissues.

In the 1967-'68 era, there were over 530,000 American troops in VN at one time, and my statistics are from a cross section of soldiers, who were mostly 20 to 30-year-old army/marine ground forces. My charge was to do autopsied on individuals who were not Killed In Action (KIA). On the other hand, if a soldier was injured in battle and Died Of Wounds (DOW) in a VN military hospital, we investigated with post mortem examinations that were limited by the sometimes-inadequate information surrounding the death. Some bodies were brought to the morgue after two or more days in a hot humid jungle swamp with bacteria-laden water. How could one forget the bloated bodies and partial skeletons?

We also did autopsies on Vietnamese citizens if they died as the result of a potential crime

by U.S. servicemen. Some Vietnamese had religious beliefs that were against "desecration" of the dead, but the necessity for justice prevailed.

Of the 111 autopsies I performed, 90 (81%) were not directly related to combat. A frequent cause of death was due to complications from battle wounds (21 of the 111). Of the remaining 90, forty-nine (54.4%) were the result of aircraft accidents and most of these were helicopter crashes with intense fire. This is not surprising because the pilots flew fast and low to avoid ground fire, in bad weather, and without required maintenance.

I personally witnessed the mid-air collision of two aircraft over Saigon and did two of the resulting autopsies. (This is reminiscent of the 1985 Galaxy Crash in Reno where I saw the fire from the explosion and did some of the autopsies.) Ten of 90 (11.1%) died of some form of undiagnosed heart disease, 7 (7.7%) died of an accidental drowning and 6 (6.6%) died in vehicular accidents. There were 3 (3.3%) homicides, and 3 (3.3%) gunshot wounds. (2 of these were accidents and the remaining one was under investigation). Two (2.2%) individuals died of alcohol intoxication and 2 (2.2%) died in parachute accidents. One (1.1%) individual died from burns in an accident, one (1.1%) died in a fall (cause unknown), one (1.1%) died of malaria, and one (1.1%) had the bad luck of lightning striking him in a lookout tower (See photograph of his torn boot).

While I was in VN, the Armed Forces Institute of Pa-

thology (AFIP), a world leader in referral in pathology, conducted a random study of soldiers who died in action, and I did 1 autopsy for the study. Its purpose was to compare the incidence of atherosclerotic heart disease (ASHD) in young US soldiers in VN to an earlier AFIP study that showed an increase incidence of ASHD. The conclusion from the VN

study did not support the conclusion of the earlier study.

Finally, all unexpected deaths of young soldiers, suspicious or not, in a war zone or not, deserve investigation and explanation of cause and manner (suicide, murder, natural or accident) of death.

111 AUTOPSIES

21 - Complications from battle wounds

49 - Aircraft accidents (helicopters)

10 - Heart disease

7 - Accidental drowning

6 - Vehicular accidents

3 - Suicides

3 - Homicides

3 - Gunshot wounds

2 - Alcohol intoxication

2 - Parachute accident

1 - Burns

1 - Malaria

1 - Fall

1 - Lightning strike

(Fallon Continued)

1998 a hose leaked forty gallons on the ground. The contaminated soil was removed, but some considered it a possible cause of the leukemia.

Theories pointed to high mercury, arsenic, or tungsten levels in the water. It was known for years that local ground and drinking water had high levels of mercury and arsenic, but few were concerned. Some suspected pesticides because Churchill County is a farming community. However, leukemia was a new event, so something must have changed. Perhaps it was just bad luck.

Overall, water contamination was considered the main culprit. Some citizens were afraid to drink or even swim in the water, and families moved away in fear. Fallon's growing population slowed, and rumors of the cancer cluster spread outside of Churchill County.

Town meetings were held every few months to disseminate information and progress from researchers. These meetings were meant to calm the population by providing information, but they often bred more fear. Arguments often broke out in the meetings and fingers were pointed in

every direction. In one way, the leukemia cluster brought the town together as everyone consoled the families of the children who were affected. In other ways, the constant blaming was tearing at the town's fabric.

At one town meeting researchers revealed that urine samples showed that people without the disease had elevated tungsten and arsenic. Also, healthy participants showed high levels of DDE, a breakdown product of DDT, in their blood. These levels were no different than the children diagnosed with leukemia, which meant everyone had the same risk. This information was suppose to show that tungsten, DDE, or arsenic were not causal agents, however, many people interpreted this finding to mean that everyone was at risk of developing leukemia. Tension and uncertainty grew.

Bottle water began "flying off the shelves" of grocery stores as people became more worried about drinking water. By the end of

2002 Churchill County had gained \$4.7 million in grants and \$2 million in loans to build a water treatment facility to purify the town's water system. While it was being built, the schools began providing free bottle water to every student and shut off drinking fountains. Using a \$100,000 grant, boxes of bottle water filled the halls of every school in the county for an entire year. This successfully eased the minds of many parents, but children took advantage of the gesture. Free water bottles meant free vessels to carry for water fights at lunchtime. Teachers at the schools began to see the bottle water as a nuisance, and empty bottles littered school grounds. Bottled water was far from a permanent fix.

After a year of supplying bottled water, a new water treatment facility was finished, and the town's water supply was as pure as, or better than, anywhere in the country. This eased some of the town's worries, but there was still the question in everyone's mind: was it enough to have clean water or has the damage been done? The town

could do nothing but wait for researchers and hope an answer would be uncovered.

By 2003 three children had died from leukemia but many of the other leukemia victims were doing well. No new cases of childhood leukemia had been diagnosed and the epidemic seemed to be over. Unfortunately, there was no closure because no cause was announced. Some research suggested a gene variation, but the evidence was inconclusive. Other papers again suggested that the high arsenic or tungsten levels could have played a part, but this again was inconclusive. Time passed and the people

of the town slowly moved on with their lives. Talk of leukemia ceased to dominate grocery store conversation and newspapers rarely brought up the subject. The town moved on, leaving behind a small footprint in history.

EDITOR'S NOTE: Another theory put forth was that the cancer cluster was due to the nuclear testing in the 1960s in Dixie Valley, which is twenty-eight miles east and downwind from Fallon. However, studies done at the test site showed that radiation did not contaminate the water supply. In addition, local tree ring analyses for the carcinogenic factors were inconclusive. No plausible cause for the leukemia cluster in Fallon was discovered.

OTHER SOURCES: student research paper by Alec Runyon (UNSOM), and Searus Mandegary (UNSOM). On April 3, 2012, at the history of medicine banquet, Attorney Cal Dunlap discussed some of the issues involved in the Fallon Leukemia cluster.