



## Pathology & Biology Section – 2005

### G44 Natural Causes of Death Among a Federal Medical Center Prison Population

Peter T. Lin, MD\*, and Eric A. Pfeifer, MD, Mayo Clinic, 200 First Street, SW, Hilton 11, Rochester, MN 55905

The goal of this presentation is to review the natural causes of death among federal prisoners treated at a Federal Medical Center during the period 1986-2004, in order to understand the spectrum of complicated natural disease present in the federal prisoner population and to use that knowledge towards a more accurate determination of manner and cause of deaths that occur while in custody.

This presentation will impact the forensic community and/or humanity by adding to the available knowledge base concerning natural causes of death in prisoner populations. Because of the referral medical center population studied, particular attention will be paid to complicated and severe natural diseases. An understanding of complex disease patterns present in prisoners will assist in accurately determining manner and causes of deaths in custody.

**Outcome:** To understand the spectrum of complicated natural disease present in the federal prisoner population and to use that knowledge towards a more accurate determination of manner and cause of deaths that occur while in custody.

Deaths that occur while in custody are routinely investigated, and often require an autopsy to determine the manner and cause of death. A thorough medicolegal investigation protects the interests of the prisoners, the custodians, and the general public by assisting in the prosecution of prison homicides, documenting natural causes of death when unnatural causes may be suspected, and identifying contagious diseases that may pose a public health risk to prisoners and facility personnel. As in nonincarcerated populations, the task of determining manner and cause of death in an apparently unnatural death is sometimes complicated by potentially lethal natural disease present in the deceased. Therefore, it is important for forensic pathologists and death investigators to understand the unique patterns of natural disease that occur in prisoner populations.

This paper will review natural causes of death among federal prisoners who were treated at the Rochester Federal Medical Center during the period 1986-2004. The Federal Medical Center system is a network of seven specialized medical centers located throughout the U.S. and operated by the Federal Bureau of Prisons. The Rochester Federal Medical Center is a major medical and mental health referral center for male prisoners. In some instances, consultations are provided through the Mayo Clinic.

Since 1986, the Mayo Clinic has performed 323 autopsies on deaths occurring at the Rochester Federal Medical Center. Of the 323 deaths, 320 were natural deaths and 3 were suicides, all by hanging. The vast majority of natural deaths could be attributed to one of 4 general categories, cancer-related (148), liver disease-related (63), AIDS-related (57), and cardiovascular disease-related (37). The average age at death for each category was: cancer-related, 54.2 years; liver disease-related, 49.6 years; AIDS-related, 39.9 years; and cardiovascular disease-related, 57.0 years. Less common natural causes of death included pulmonary embolism (3), stroke (3), sepsis (2), end stage renal disease (2), aspiration pneumonia (2), chronic obstructive pulmonary disease (1), warfarin toxicity (1) and sarcoidosis involving the heart (1). Among the cancer-related deaths, the five most common primary sites were lung (45), hemato-lymphoid (17), colon (16), pancreas (12) and head and neck (10). In addition, hepatocellular carcinoma was identified in 17 prisoners who died of liver disease. Some of the more unusual tumors included malignant fibrous histiocytoma (1), gallbladder carcinoma (1) and osteosarcoma (1). Among the 37 cardiovascular causes of death, 34 were due to ischemic heart disease and 3 were due to idiopathic dilated cardiomyopathy. Among the 63 liver-disease related deaths, 55 were associated with chronic hepatitis C infection, 3 with alcohol abuse without evidence of hepatitis C infection, 3 with no known cause, and 2 due to primary sclerosing cholangitis. The highest number of liver-related deaths occurred in 1999, accounting for 12 of 29 deaths that year. AIDS-related deaths peaked in the year 1995, accounting for 11 of 23 deaths that year.

This study differs from previous studies of prison deaths because the study population consisted only of prisoner deaths occurring at a Federal Medical Center. Unnatural and sudden deaths are notably lacking due to the population studied, but the three suicides by hanging corroborate previous reports of an increased risk for suicide while incarcerated; the preferred modality being hanging. The over-representation of cancer-related deaths reflects the referral center population of this study. Previous studies have found cardiovascular disease to be the most common natural cause of death among prisoners. The distribution of cancer types suggests an increased number of deaths from hemato-lymphoid and head and neck cancers, and a decreased number of deaths from prostate cancer, compared to the general population.

Overall, the spectrum of disease present in federal prisoners appears to be as wide as would be expected in a prisoner population numbering over 2 million in 2003. With frequent allegations of prisoner



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maltreatment bringing increasing scrutiny into deaths occurring while in custody, further studies of natural disease in prisoners will assist in determining manner and cause of deaths in custody.

**Natural, Deaths, Custody**