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# Severe hair loss induced by anthrax vaccine and reversed by the treatment with zinc

Mohammed Ali Al-Bayati, PhD, DABT, DABVT

Toxicologist and Pathologist

Toxi-Health International

150 Bloom Dr., Dixon, CA 95620 USA

Phone: +1 707 678 4484 Fax: +1 707 678 8505

Email: maalbayati@toxi-health.com Website: <http://www.toxi-health.com>

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## Abstract

A USA Air Force Master Sergeant suffered severe hair loss from the scalp and face a few weeks after receipt of his fifth dose of anthrax vaccine. He also suffered from a reduction in his eyesight, insomnia, headaches, involuntary twitches of the right arm muscle, and memory loss. In addition, he felt chronically tired, had hot and cold flashes on his head, and cold flashes on the back of his neck. My investigation of this case revealed that hair loss and serious systemic illness have also been reported by some other individuals who received anthrax vaccine and other vaccines. Differential diagnosis was used to evaluate the medical evidence in this case to identify the causes of illness and hair loss. Treatment with zinc gluconate at a dose level of 60 mg zinc per day for a few months subsequently led to the complete reversal of hair loss in this case. It is plausible that vaccines induced a stage of zinc deficiency by activating the immune system and increased the utilization of zinc. Zinc is an essential element required for hair metabolism and the activation of the immune system.

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*Keywords:* Anthrax vaccination, hair loss, zinc treatment

## 1. Case History

Air Force Reserve Master Sgt. Clarence L. McNamer lost his hair in June 2000, two months after receipt of his fifth dose of the anthrax vaccine (AV). He received five doses of anthrax vaccine and a typhoid vaccine within an eleven and half month period (Table 1). The AV was manufactured by Bioport, Inc., Lansing, Michigan. McNamer, a 51 year-old white male with 31 years of service in the United States of America Air Force Reserves, performs duty as a flying crew chief on C-5 aircraft at Travis Air Force Base in California. McNamer has also worked at Travis Air Force Base since 1972 as an aircraft fuels hydrant specialist and an aircraft maintenance technician.

**Table 1. McNamer's vaccination history preceding his hair loss**

Vaccination Type	Dose No.*	Inoculation Date mm/dd/yyyy	Vaccine Lot No.	Interval time (weeks) between vaccines
Anthrax	1	04/17/1999	FAV043	First Inoculation
Anthrax	2	05/01/1999	FAV043	2
Anthrax	3	07/10/1999	FAV044	10
Anthrax	4	01/22/2000	FAV03	30
Typhoid	1	01/22/2000	R0234	--
Anthrax	5	04/01/2000	FAV031	10

\*Volume injected per vaccine dose = 0.5 mL

McNamer developed flu-like symptoms six weeks after receipt of his fifth anthrax vaccine (AV) injection and two weeks later developed scalp hair loss. His wife was cutting his hair and noticed 5 round areas in various locations on his scalp, each about 1" (2.54 cm) in diameter, that were missing hair and had sores in them. Six weeks later, he lost most of his hair. Figure 1A shows McNamer with his normal hair pattern prior to

receiving his fifth dose of anthrax vaccine on April 1, 2000 and Figure 1B shows him losing a significant amount of his hair at three months following his fifth anthrax vaccine dose. He also lost hair from his eyebrows and facial area. His hair loss progressed as shown in Figure 1C and reached near baldness as shown in Figure 1D.

In addition to hair loss, McNamer suffered from systemic illnesses following administration of his fifth anthrax vaccine dose. These included reduction in his eyesight, insomnia, headaches, involuntary twitches of the right arm muscle, and memory loss. He also felt chronically tired, had hot and cold flashes on his head, and cold flashes on the back of his neck.

McNamer consulted with several physicians, both in the Air Force and civilian sectors, who performed many medical tests [1-3]. He was hoping to discover the possible cause(s) of his sudden onset of health problems and to obtain proper treatments (a) to stop the progression of his illness and (b) to reverse the damage. He spent several thousand dollars of his personal funds on consultations with physicians and associated medical tests and took more than one hundred hours of his sick leave and annual leave. Physicians told him that he was suffering from alopecia areata (middle-aged male baldness) and/or autoimmune disease [2-3]. Some physicians recommended treatment with corticosteroids which have serious side effects.

Rather than accept the diagnoses given by his physicians—that he was suffering from middle-aged male baldness or autoimmune disease—McNamer suspected that his sudden health problems may be the result of his receipt of the anthrax vaccine and/or his occupational exposure to certain levels of JP-8 jet fuel. By June of 2000, his hair loss became more severe, his personal medical expenses were becoming excessive, and he became depressed. The Air Force, his workplace, and his pri-

vate medical insurance did not want to pay his medical expenses. The Air Force denied the link between his illness and the AV, he did not have proof to show that the jet fuel caused his illness, and his private medical insurance did not pay medical expense for the diagnosis given by the physicians who suggested McNamer suffered from male pattern baldness [2-3].

McNamer consulted with me in June of 2000 and requested that I evaluate the medical evidence in his case. He was hoping to discover the possible cause(s) that triggered his sudden illness and to obtain recommendations for proper treatments to stop the progression of his illness and to possibly reverse the damage. I evaluated McNamer's case history, the impact on his health of his exposure to chemicals at his workplace, his medical records, and adverse reactions to vaccines. I used differential diagnosis to evaluate the involvement of all possible agents individually and the synergistic actions among agents in causing McNamer's sudden onset of illness. I found that the anthrax vaccine caused McNamer's sudden hair loss by inducing zinc deficiency.

My recommendations to stop the progression of McNamer's illness and to reverse his hair loss and other systemic damage induced by the vaccines consisted of oral treatment with zinc gluconate (60 mg zinc per day), Alpha Lipoic acid (200 mg per day), and vitamin supplement [1]. Signs of hair recovery were observed after about three months of treatment with zinc (Figure 1E) and the complete recovery occurred in about nine-months (Figure 1F). The hair recovery started with the appearance of fine white hair on the head that later became coarser and black (Figure 1E).

In January of 2001, I submitted a report to the Air Force medical authorities concerning McNamer's case which described my findings and recommendations [1]. Upon evaluation, McNamer was granted a waiver from receiving a future dose of anthrax vaccine based upon recommendations presented in my report [2-3]. Furthermore, in March of 2002, he received US \$11,000 in compensation for his medical expenses. He was also compensated for the 130 hours he had taken as sick leave and annual leave to seek medical advice and treatment. Descriptions of the medical evidence and the procedure that I used to identify the causes of McNamer's illness are given in the next section.

## **2. Review of medical evidence and identification of causes of illness in McNamer's case**

McNamer had enjoyed good health prior to receiving his fifth dose of AV on April 1, 2000 (Table 1). My review of his work history showed that he had worked as an aircraft fuels hydrant specialist and an aircraft maintenance technician at Travis Air Force Base since 1972 and the primary chemical product used in his workplace was JP-8 jet fuel. The long-term exposure to low levels of jet fuel at the workplace can cause dermatitis in the areas of contact such as the hands of workers but not a sudden systemic hair loss as shown in McNamer's case. McNamer lost a significant amount of hair from the scalp, eyebrows and facial area. The microscopic examination of the skin biopsy taken from the scalp did not show any evidence of

dermatitis or any abnormal changes that indicated McNamer was suffering from dermatitis or an autoimmune disease [1].

Furthermore, McNamer developed flu-like symptoms six weeks after he was inoculated with his fifth dose of anthrax vaccine (AV) and two weeks prior to suffering from hair loss.

The results of his lung function test and chest x-rays were normal and these results indicated that McNamer did not have a significant exposure to JP-8 jet fuel by inhalation that causes respiratory system problems or sudden hair loss. In addition, the results of several blood tests taken during the first three months of McNamer's illness showed that his hematological and serum values were within normal range. The results of his blood tests also indicate that he has normal thyroid function and no indication of autoimmune disease [1].

My review of the medical literature on the adverse reactions to vaccines indicates that there is a link between McNamer's sudden hair loss and his vaccinations. For example, an historical study reported a total of sixty individuals that developed hair loss following immunizations. These patients (males and females) ranged in age from 2 months to 67 years. Intervals from vaccination to onset of hair loss were provided for fifty cases and in 84% of these cases, the hair loss occurred within approximately 1 month following vaccination. Furthermore, sixteen of these patients reported severe and extensive hair loss over more than half of the head or the body. One of these cases involved a 56-year-old, white woman who received the influenza virus vaccine and 10 weeks later developed hair loss affecting her scalp and axillae. The result of a scalp biopsy was negative. This woman also suffered from severe hair loss 1 year earlier after receiving the influenza virus vaccine [4].

Sudden hair loss in people similar to that experienced in individuals post-vaccination has also been reported among individuals who suffered from zinc deficiency [5]. Diffuse hair loss occurred in 47 out of 130 patients who underwent Vertical Gastroplasty (VG). All patients had been routinely advised to take multivitamin supplements, but 47 developed hair loss despite taking the supplement. These patients were then prescribed zinc sulphate 200 mg 3 times a day in addition to their vitamin supplementation. Arrest of hair loss and regrowth occurred in all patients. However, 5 patients reported recurrence of hair loss after stopping zinc treatment and this loss was reversed within 6 months of receiving zinc 600 mg daily [5].

Adverse reactions to the anthrax vaccine that required hospitalization have also been described in individuals that received this vaccine [6, 7]. For example, after the first AV dose, 47(7.9%) of 595 individuals reported seeking medical advice and/or taking time off work for complaints (e.g., muscle or joint aches, headache, or fatigue). These health problems were also reported by 30 (5.1%) of 585 individuals after the second AV dose, 30 (5.1%) of 585 individuals after the third dose, 16 (3.0%) of 536 individuals after the fourth dose, and 17 (3.1%) of 536 after the fifth dose.

Furthermore, in the USA, Vaccine Adverse Events Reporting System (VAERS) received 428 reports related to anthrax vaccination adverse effects as of April 7, 2000. Of these 311 (72.9%) concerned systemic reactions, 78 (18.2%) were reports on mild or moderate local reactions, and 39 (9.1%) were of large or complicated local reactions. Thirty-six cases (8.4%)

met the Department of Defense mandatory reporting criteria (i.e., hospitalization and/or time off duty greater than 24 hours).

The possible explanation for the sudden loss of hair in McNamer's case was the activation of his immune system by the anthrax vaccine that resulted in zinc deficiency. He received his fifth anthrax vaccine dose at ten weeks following receipt of anthrax and typhoid vaccines (Table 1). Zinc is an essential element for hair metabolism and the functions of the immune system. In addition to hair loss, zinc deficiency also leads to the impairment of the unspecific and specific immune response. Immunological defects are seen even in marginal and moderate zinc deficiency [8]. The complete reversal of McNamer's hair loss and the improvement of his health after receiving zinc and vitamin supplements confirmed the diagnoses of zinc deficiency and adverse reactions to the anthrax vaccine.

### 3. Conclusions and Recommendations

The medical evidence presented in this report clearly shows that McNamer's sudden health problems were caused by the anthrax vaccine and his case is not an isolated incidence. It also shows that some physicians, in both the military and the civilian sectors, lack the proper training to deal with the issue of adverse vaccine reactions and/or they do not want to face this issue due to political and financial conflicts of interests.

I have evaluated the health conditions of several individuals who suffered from adverse reactions to vaccines and medications or exposure to chemicals at the workplace. Prior to consulting with me, physicians had assigned diagnoses including autoimmune disease or idiopathic (cause unknown) describing the causes of illness in these individuals. Some were treated with corticosteroids and others with immunosuppressant compounds that led to serious health problems.

In addition, I have evaluated four cases concerning infants that died as a result of adverse reactions to vaccines and medications. Their parents or caretakers were falsely accused of killing them and were imprisoned based on unscientific testimonies and sloppy medical evidence presented by the physicians and medical examiners involved in these cases [9-11].

I am pleased that the Air Force medical authority took the time to review my report in this case and decided to compensate McNamer for both the medical expenses and time spent in this case. I am also grateful that McNamer was granted a waiver from receiving another future anthrax vaccine; thus, avoiding the occurrence of similar or more serious adverse reactions [2, 3]. However, it took McNamer about two years and major efforts on both his and my part to bring this case to a successful conclusion. The evidence presented in this report shows that up to 7.9% of individuals that received the anthrax vaccine suffered from minor to severe adverse reactions. Medical systems in both military and civilian sectors should be prepared to deal with these serious and costly problems.

Dealing with the problems of adverse reactions to vaccines and medications in a proper and scientific manner as in McNamer's case helps individuals to regain their health and

assists physicians in better understanding the biological mechanisms of illness that are involved. Physicians need to exercise more caution when assigning vague diagnoses such as idiopathic and autoimmune diseases to health conditions that they cannot readily solve or explain. It is important for physicians to help their patients seek the assistance of experienced toxicologists. Furthermore, physicians who are making decisions for healthcare providers also need to recognize the important service provided by toxicologists in cases of individuals suffering from adverse reactions to vaccines and medications.

Today, there are about 60,000 chemicals used in our workplaces, 2000 active chemicals in our prescription drugs, and our children are receiving many different types of vaccines. Infants are given up to seven vaccines in one day. It is well known that many people have suffered from adverse reactions to medications, vaccines, and occupational exposure to chemicals. However, physicians and insurance companies are not consulting with experienced toxicologists who are trained to recognize illnesses resulting from exposure to chemicals and vaccines. These problems need to be urgently addressed by the medical industry, insurance companies, the government, and general public. Using a scientific approach in dealing with medical problems will yield correct solutions, improve the quality of our medical care system, and save lives and vital resources.

### Acknowledgements

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Figure 1. Photographs of McNamer showing his normal hair prior to receiving his fifth anthrax vaccine (A), his hair loss from the scalp after vaccination at 3 months (B), 4 months (C), and 5 months (D); also showing the re-growth of his hair after 3 months (E) and 9 months (F) of receiving zinc supplements (60 mg per day).

