Health Threats to Soldiers Serving in the Sinai

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WHETHER IT BE from Moses' wanderings during the Exodus or the Egyptian–Israeli conflicts since the 1940s, most people have heard of the Sinai in eastern Egypt. The Sinai Peninsula, one of the world's most beautiful and strategic landscapes, comprises 23,000 square miles (similar in size to West Virginia) between the Mediterranean Sea to the north and the Red Sea to the south. To its west and running northward are the Gulf of Suez and the Suez Canal, the shortest sea link between the Indian Ocean and Mediterranean Sea. To its east are the Gulf of Aqaba, Saudi Arabia, Jordan and southern Israel, important bridges between Africa and the Eastern Hemisphere. As testimony to its geopolitical and historical significance, more than 50 armies have marched through the Sinai.[1]

Fishermen and merchants inhabit the coast, while Bedouin goat and sheep herders live in the interior. Egypt's official religion is Islam, and its language is Arabic. The Sinai's rugged appearance belies its ecological fragility. Coral reefs along the Gulf of Aqaba and the large springs at the Sinai's northwestern edge are just two examples of the rich natural resources there in danger of overuse. The Sinai Desert is known for hot days, chilly nights, winter floods and shifting sands. Spring sandstorms, rugged terrain and extremes of heat and cold wreak havoc upon people and equipment alike. Still, its majestic natural surroundings, spiritual sites such as Mount Sinai and St. Catherine's Monastery and its rich biblical history make the Sinai an impressive location.

Over the last 45 years, fierce fighting and a courageous peace have been the Sinai's legacy. War erupted after the proclamation of the State of Israel in 1948, and other conflicts followed, including the 1956 Anglo–Franco–Israeli invasion of Egypt following the Suez Canal's nationalization, the 1967 Six–Day War and the 1973 Middle East War. Since 1973, there has been relative peace in the region, excluding the Gulf War in 1991. In September 1978, Egypt's President Anwar Sadat and Israel's Prime Minister Menachem Begin signed the Camp David Accords, which later in the 1979 Treaty of Peace ended the state of war existing between the two countries since 1948 and set terms for Israel's phased return of the Sinai, establishing new relationships between the two countries.[2]

As part of the Treaty of Peace, the Sinai was divided into zones A, B and C with a narrow strip, Zone D, within Israel. Each zone has limits on the military force types and numbers it can contain. Zone C, which borders Israel, contains civil police and government officials but no Egyptian military forces.[3]

The Multinational Force and Observers (MFO), a light infantry peacekeeping force, was deployed in 1982 to observe, report and verify treaty violations by both parties in all four zones. Civilian observers assess potential violations. Additionally, the MFO has a three–vessel coastal patrol unit to monitor traffic along the southern Sinai coast.

The US Army is part of the 11–nation (non–UN) MFO, which is composed of approximately 3,000 soldiers, civilian observers and support personnel. The other 10 countries are Australia, Canada, Colombia, Fiji, France, Hungary (since fall 1995), Italy, New Zealand, Norway and Uruguay. The MFO occupies 33 outposts in Zone C and the installations in El Gorah, or North Camp, and Sharm el Sheik or South Camp, which are 370 miles apart. The US contingent is composed of the 1st US Army Support Battalion (1SB) and its four companies, which serve one year, and a light infantry battalion from one of four US divisions, which rotates every six months and is based in southern Sinai.[4]

The first light infantry battalion of Active Army, National Guard and Army Reserve soldiers assigned to the Sinai MFO is now complete. The last 200 members of the 82d Airborne Division's Task Force

4th Battalion, 505th Parachute Infantry Regiment, deployed from Pope Air Force Base, North Carolina, in late January. They joined other members of the 548–member task force, which began deploying to the Sinai in early January for a six–month tour of duty. The US deployment represents the first time in 13 years of MFO support that volunteers from the Reserve Component have been included in the mission.[5] Colombia and Fiji also provide light infantry units to remote outposts, while Italy provides support to the naval unit and France to the fixed–wing unit. Egyptians work at the two main installations performing various tasks through a contractual agreement with a commercial Egyptian company.

Thirteen years' experience in the Sinai has helped MFO and US peacekeeping troops identify the most significant military health threats and may serve as a guide for health planning if a larger–scale deployment or more unstable operational situation develops. The North and South camps have physicians and medics to provide health care, while outposts only have medics for routine and emergency care. Ground or air medical evacuation to northern or southern camps and, if necessary, to larger medical centers in Egypt (Cairo) or Israel (Tel Aviv, Eilat or Beersheba) is available. The US Naval Medical Research Unit (NAMRU) No. 3 in Cairo, established in 1946, conducts infectious disease research in the region and has assisted the MFO with investigations of diseases such as cutaneous leishmaniasis, a sandfly–spread disease that causes skin ulcers.[6]

Immunization and Prophylaxis

The US military is effectively meeting the challenges of downsizing, force projection and a rapidly changing world situation with versatility and strength as reflected by the continuing success of MFO Sinai deployments. The next century will pose even greater health risks and challenges as peacekeeping deployments increase. Like no time before, these changes will require that today's soldiers be trained and ready to operate effectively anywhere in the world. However, like their military forebears, soldiers occupying future foxholes must defend themselves against insects and disease. Leaders should know that the immunizations listed below are required for all MFO personnel deploying to the Sinai.

- Hepatitis A/Immune Serum Globulin (ISG): 5cc every six months.
- Tetanus/Diphtheria: one dose every 10 years.
- Yellow Fever: one dose every 10 years.
- Oral Polio: one dose following a primary series.
- Influenza (September through February): one dose annually.
- Meningococcal: one dose within three years before deployment.
- Typhoid Fever: a booster within three years before deployment.

A tuberculin skin test, PPD, is also required before deployment. All health care workers should receive the hepatitis B series, and animal handlers should be current on the pre–exposure rabies vaccination series. The threat of plague and cholera is not currently significant. Anticipating even the remote possibility that some soldiers might transmit El Tor cholera, the MFO has placed special emphasis on preventive sanitation measures.[7] The El Tor vibrio serotype was named after the El Tor Quarantine Station in the Sinai, circa 1906.[8] Soldiers should also receive the primary series of measles, mumps and rubella shots before deploying.

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Malarial risk is minimal in the Sinai but exists in rural isolated areas of the Nile Delta, El Faiyoum, some oases and parts of southern Egypt. Travelers to these areas should take chloroquine and use personal protective measures.[9]

Heat Disorders

Heat disorders—stroke, exhaustion and cramps—are the major environmental threats to soldiers deployed throughout the Sinai, particularly in the south where temperatures can reach 120 degrees Fahrenheit. These disorders may appear as primary problems or exacerbate other conditions such as diarrhea and fever. To prevent heat disorders, soldiers must have time for acclimatization, tailored work and rest cycles and adequate hydration. The Wet Bulb Globe Temperature Index should serve as a guide in preventing heat injuries. Command emphasis on proper hydration procedures may be required. A unique situation developed in the MFO at El Gorah

The current state of worldwide deployments dictates that soldiers may frequently need to get acclimated to climates that are ostensively less severe than the Sinai.

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in 1991, when drinking water pumped from the usual source, a northern Sinai aquifer, gradually became nonpotable due to elevated total dissolved solutes, chromium and other compounds. To prevent an increase in heat–related illnesses, MFO personnel stationed at El Gorah have been receiving bottled water with directions on quantities to consume.

Soldiers must be educated about factors that may contribute to heat disorders such as excessive activity, inadequate salt and water intake, sweat inhibitors (occlusive clothing or skin conditions), diarrhea, fever–causing illnesses, obesity, fatigue, lack of sleep, alcoholism, history of heat stroke, poor physical condition and taking various medications such as anticholinergics, salicylates and antihistamines.[10] Spring sandstorms can raise temperatures 20 to 30 degrees within a few hours, and ambient dust can be hazardous to those prone to respiratory diseases.

Infectious Diseases

Infectious diarrhea is the most common debilitating illness among travelers to Egypt. In 1991, approximately 60 MFO North Camp soldiers experienced acute diarrhea, which was traced to contaminated dining facility milk. However, MFO personnel most often contract "travelers' diarrhea" when visiting sites outside the Sinai or eating locally prepared food. Consuming only thoroughly cooked foods, canned or bottled beverages without ice and pasteurized dairy products are necessary precautions in preventing diarrhea. Common pathogens that can cause diarrhea include enterotoxigenic E. coli, Salmonella spp., Shigella spp., Campylobacter and Giardia lamblia. Less common pathogens include Entamoeba histolytica, Cryptosporidium spp. and rotavirus. Most diarrhea is self–limited and responds well to treatment with adequate hydration. Moderate to severe diarrhea cases may require a three–to five–day course of antibiotics. Although antibiotic resistance has become an increasing problem, most diarrhea cases will still respond to antibiotics.[11]

Sandfly fever, spread by an infectious sandfly bite, is a significant risk to nonindigenous personnel in the Sinai. Although the illness is self–limiting, it can be debilitating for up to several weeks. High season for sandflies is April through November. Compliance with the US military's personal protective measures system—which also includes applying 33 percent extended–duration insect repellent to skin, spraying permethrin on the battle dress uniform (BDU) and netting and wearing the BDU properly—can be very effective in preventing diseases spread by insects and spiders.[12] So far, sandfly fever has not been a significant problem in the MFO.

The cutaneous leishmaniasis (CL) skin disease is widespread in the Sinai, peaking from June through September. Risk of visceral leishmaniasis—a disease that attacks the internal organs—is low. Many CL cases have been reported in the MFO, particularly at two Fijian–manned outposts. Beyond increasing personal protective measures and rodent and sandfly control, relocating the two outposts has been considered. In 1990, two Colombian soldiers were diagnosed with L. braziliensis, a "New World" variant of

Israeli Defense Forces

Destroyed or abandoned Egyptian equipment litters the Mitla Pass area, 11 June 1967.

The Sinai poses special hazards to drivers. Drifting sands, which may cover wide patches of road, make road surfaces surprisingly slick. . . . Sandstorms and sun glare reduce visibility. Given heavy loads and mountainous terrain, it is essential to drive slowly enough to allow for sufficient braking distance.

Unexploded ordnance from previous battles litters the Sinai. It is not uncommon for Bedouins to disarm ordnance or bring it to MFO personnel for disposal. . . . It is essential that individuals stay on main routes in the Sinai unless accompanied by an experienced guide. The bottom line: Stay clear of suspicious objects.

the skin disease not normally found in the Eastern Hemisphere. It is unclear whether Middle East sandfly species can transmit L. braziliensis.[13] Investigators at NAMRU No. 3 and others have been conducting ongoing CL surveillance in the Sinai.

Hepatitis A, B and E are highly endemic to Egypt and pose a major health risk to MFO personnel. For prevention, soldiers should receive ISG or hepatitis A vaccines before deployment. Hepatitis B vaccine should be given to health care workers and others working closely with local inhabitants who may be hepatitis B carriers. Egypt also has a high antibody prevalence of hepatitis C.[14] Hepatitis E, previously classified as enterically (spread via the digestive system) transmitted non–A, non–B hepatitis, may account for 25 to 50 percent of hospitalized cases of acute viral hepatitis in Egypt.[15]

Other infectious disease threats of potential military significance are partially dependent upon activities, contacts and travel to other areas in Egypt and Israel and include typhoid and paratyphoid fevers, meningococcal meningitis, schistosomiasis (infestation with parasites that enter through the skin), rabies, flea–borne typhus, boutonneuse fever (a tick–borne illness causing achiness and other symptoms), trachoma (chronic inflammation of eye membranes) and tuberculosis. Various helminths, such as tapeworms, roundworms, pinworms and whipworms, are found throughout the region. Sexually transmitted diseases, such as syphilis, gonorrhea and AIDS, occur at rates generally lower than in Western countries.[16] Rift Valley fever has recurred in Egypt's Aswan/Luxor area, the Giza area west of Cairo and the Sharquia area in the east–central portion of the Nile Delta north of Cairo.[17]

Venomous Threats and Accidental Injuries

Six venomous snakes live in the Sinai, including desert black snakes, saw–scaled vipers and Persian–horned vipers. Their bites usually cause only localized symptoms, but fatalities do occur. Fortunately, no snake–bite deaths have been reported among the MFO to date. Antivenom is available for only two of the snakes. Additionally, the yellow scorpion and black widow spider on land, and jellyfish, fire coral, cone shells, stone fish and lion fish off shore present additional risks to unsuspecting personnel.[18]

The Sinai poses special hazards to drivers. Drifting sands, which may cover wide patches of road, make road surfaces surprisingly slick. Shifting sands also may move or uncover old land mines; therefore, driving over open sand should be avoided. Sandstorms and sun glare reduce visibility. Given heavy loads and mountainous terrain, it is essential to drive slowly enough to allow for sufficient braking distance. Drivers should also have adequate supplies of water, fuel and basic spare parts at all times. Despite a rigorous driver safety program, the

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MFO has had several driver fatalities.[19]

Soldiers deployed to locations similar to the Sinai are sometimes bored and feel isolated. Adjusting to unfamiliar surroundings and separation from loved ones takes time.[20] Leaders should watch for signs of alcohol abuse and should discourage general rough-housing that can undermine discipline and possibly lead to orthopedic and other injuries. Sports injuries account for the largest unintentional injury category. To alleviate soldiers' boredom, leaders can encourage them to take advantage of the MFO's educational, recreational, social and travel opportunities.

As previously mentioned, unexploded ordnance from previous battles litters the Sinai. It is not uncommon for Bedouins to disarm ordnance or bring it to MFO personnel for disposal. Explosions, usually involving Bedouin children, often occur. It is essential that individuals stay on main routes in the Sinai unless accompanied by an experienced guide. The bottom line: Stay clear of suspicious objects.

Although the "winds of peace" seem to be blowing in Southwest Asia, visitors should be aware of the potential for terrorism and learn to minimize their risk. Keeping abreast of political events, such as peace negotiations between the Israelis and Palestinians, is essential. Over the last two years, several foreigners have been killed or wounded due to political violence in the region. Travel to areas such as East Jerusalem, the West Bank and Gaza may require special attentiveness to safety for years to come.

In the post-Cold War era, we can anticipate expanded roles for the United States and other countries in international peacekeeping. Military forces must be prepared for a wide range of contingencies.[21] Identifying mission-specific threats to soldiers' health and taking adequate steps to prevent disease and injury will always be key components for successful peacekeeping. The MFO's history provides useful lessons about successful international peacekeeping and serves as a model for emerging missions in other troubled parts of the world. ***MR***

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