

Abstracts

means of dispersion and characterization of nuclear materials within and outside of the compound. Normal facility operations, military actions, and looting of the facility could have contributed to the release of radioactivity, but would yield quite different geographic and radionuclide profiles.

Detailed gamma, alpha, and beta radiation profiles were examined for 400 geographically-referenced soil samples collected from ATNF and the villages of Ishtar and Al Ryhad. Natural uranium clusters were identified in several locations clearly showing that looting of yellowcake was the primary means of dispersion. No dispersion of nuclear materials was shown to result from military operations at the site. Our programs demonstrate the precision of geographic-based forensic reconstructions and show that forecast models are robust.

10. NEW DIRECTION IN ANTIDOTE TREATMENT OF OPC INTOXICATIONS (4)

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The toxic effect of organophosphorus compounds (OPC) is based on inhibition of acetylcholinesterase (AChE), enzyme which plays an important physiological role in the cholinergic nervous system. The drug therapy on intoxication with OPC included mainly combination of cholinesterase reactivators and cholinolytics. There is no single AChE reactivator having the ability to sufficiently reactivate inhibited enzyme due to the high variability of chemical structure of the inhibitors. The classic oximes have antidote effect against intoxication with sarin, Vx and tabun, but are not effective against soman. HI-6 (Bulgarian ampoule form "Toxidin") has an effect against sarin, soman and Vx, and to a lesser degree against tabun.

In order to improve the treatment of poisoning with highly toxic OPC, in our laboratory we synthesized a variety of mono- and dioximes. We use different numbers of pyridinium or heterocyclic rings, different length and shape of the connecting chain between pyridinium or pyridinium-heterocyclic rings; different number and position of the oxime groups at the pyridinium rings and others. The investigations of some authors and our research showed that the compounds which present a combination between HI-6 and TMB-4 have a better antidote activity against tabun intoxications.

The important finding of this study is that we synthesized complex compounds, reactivators of cholinesterase activity (including HI-6) with AMP / ATP and polycarboxilats, which have prolonged action in organism compared with original oximes. Pharmacokinetic studies showed that they are eliminated more slowly.

The antidotal efficacy of these compounds after soman poisoning in rats was similar like that of the original oximes. The same tendency showed and the other pharmacological (blood pressure, EKG,

breathing, neuromuscular transmission), and biochemical (ChE) investigations.

Key words: oximes, reactivators of cholinesterase, organophosphates, soman, complex with AMP and ATP, polycarboxilats

11. PREVALENCE OF SKIN CANCERS AMONG IRANIAN VETERANS, 18-23 YEARS FOLLOWING EXPOSURE TO SULFUR MUSTARD (14)

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In this historical Cohort, in a population of 800 veterans with documented history of exposure to Sulfur Mustard during the period of 1984-88 (all have been under the close health monitoring program) 25 cases are found to have developed skin cancer over the past years.

The most common cancer among these cases has been Basal Cell Carcinoma -BCC- with 9 cases and then Squamous Cell Carcinoma -SCC-, mycosis fungoides-MF-, Bowen disease and Dermatofibrosarcoma protuberans - DFSP- (5, 5, 4 and 2 cases respectively).

Considering the number of diagnosed skin cancers among the subjects of this study and new cases even 2 decades after exposure, more in depth studies are necessary to investigate the possible casual relationship between the exposure to mustard gas and the skin cancers.

Key words: Sulfur Mustard, Cancer, Skin, Iran-Iraq War

12. SCIENCE AND TECHNOLOGY VS. DEFENSE AND SECURITY: DUAL USE CONSEQUENCES, A SOUTH AMERICAN PERSPECTIVE (14)

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Nowadays we can say that science and technology are development driven forces in most countries, with some exceptions especially in the Southern Hemisphere. Even though, we have to take into account their link to and impact on defense and security and not only when it comes to WMD but also in the economy and academy areas, both in developed and developing countries.

Within this framework, when we analyze the spread of technology and knowledge, it is important to consider: the media where it takes place (e.g. journals, internet, conferences, commercial agreements); which the actors involved are (e.g. scientists, governmental agencies, commercial firms); and the motive why it



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occurs (e.g. scientific discoveries; commercial exchange; international agreements).

Once known all these elements, which vary both intracountry and intercountry, we may have a deep and broad enough framework to consider which policies to take in order to foster scientific and technologic development without collaborating with state and non state WMD programs.

Although we already have a legal framework to fight against WMD proliferation and terrorism, the diverse degree of success of such instruments makes it necessary to continue analyzing and debating ways to strengthen them and/or find new ones.

Therefore, in this paper we will analyze how the phenomena of science and technology development and spread impacts on defense and security from a South American perspective, taking into account the particular differences among developed and developing countries.

Among the primary findings we can mention the existing differences between countries when it comes to the place (military, academic or commercial ones) where the critical science and technology innovative developments take place; the origin of funding (private or governmental); the existence and fulfillment of plans to foster science and technology development; and the scientific community awareness in WMD topics. All these elements have a complex interaction, and to know them will allow us to be closer to a better understanding of the situation and so reinforce the current legal instruments in order to improve the way how they work now.

Key words: science, technology, defense, security, dual use, WMD

13. THE IMPACT ON NON-PROLIFERATION WITH A GROWING NUMBER OF BL-3 AND BL-4 LABS IN SOUTH AMERICA (16)

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After 2001 events (9/11 and anthrax letters) we witnessed the dramatic growth of the biodefense sector, and in within this framework, the increment of the number of high biosafety level laboratories (BSL3 and BSL4) both in central countries and peripheral ones. It is important to point out that not all the labs are devoted to activities related to biodefense but also to biological research from a traditional perspective.

In this scenario, and as an unwanted consequence, we have noticed that the number of people –professionals with different level specialization– which have the information and skills that could be used to produce BW, grew vertiginously as well.

So, considering the biodefense sector from a systemic perspective, we are being witnesses of how due to an intent to protect ourselves against the biological threat, our vulnerability to it gains an unexpected magnitude.

Therefore, in this paper we will analyze the phenomenon of the growing number of high security level labs, first, in a global perspective and later, with focus in South America in order to determine if this evolving situation represents a security problem. In order to do that, we will approach the problem from different perspectives: health care, development, security/safety, defense and non proliferation.

Key words: BSL3, BSL4, non proliferation, development

14. REACTIVE SKIN DECONTAMINATION LOTION AND DEMILITARIZATION: PARTNERS IN GLOBAL SAFETY (10)

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The work of demilitarization relies on procedures, equipment, and training to minimize exposure to Chemical Warfare agents. As an additional safeguard, immediate access to Reactive Skin Decontamination Lotion (RSDL) can minimize the harm of accidental exposure to CW agents.

To illustrate the advantage of having RSDL available during demilitarization, this presentation will compare the outcomes of two patients who were exposed to Mustard, one of which was treated with RSDL and one that was not.

Two individuals were exposed to mustard during a demilitarization operation at Defence Research and Development Canada; the two individuals received different treatments.

Patient A: Treatment was not immediate, but RSDL was applied within the first 24 hours following exposure. Subsequently, treatment included depressurizing the blister, silver sulfadiazine dressing and the intake of oral antibiotics. Patient A healed over seven days and returned to work soon thereafter.

Patient B: Treatment followed the then existing standard approach which included immersion in a detergent solution. Subsequently, treatment included depressurizing the blister, silver sulfadiazine dressing and oral antibiotics. Patient B required oral prophylactic antibiotics, topical and oral antihistamines and topical steroids and a recovery time of four weeks. While RSDL significantly increased the recovery time and reduced the suffering, it should be pointed out that if RSDL had been pre-positioned in the laboratory, an even greater impact on patient recovery should have been expected. Immediate access to RSDL is even more important for the faster acting agents and should be considered as an essential part of all demilitarization activities.

Key words: RSDL, Demilitarization, CW Agents, Topical Treatment



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