Session 2: Chemical, Biological, Radiological, and Nuclear

Chairs: Victor Koscheyev; J. DeCock

Differentiated Tactical and Therapeutical Approach to Nerve Agents of the Same Chemical Class as a Result of Their Different Physical, Chemical, and Physiological Properties

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Background: Nerve agents are toxic substances which primarily cause an inhibition of the enzyme acetylcholinesterase (AchE). The varying chemical substances of the same class of nerve agents have different physical, chemical, and physiological properties, such as their signature aging half-life. Early specific chemical identification of these agents will impact triage and therapeutic measures.
Discussion: Nerve agents are derivates of organophosphates (OP) with very specific physical, chemical, and pharmacological properties. Nerve agents are usually divided into the G series, such as sarin (GB), and V series, such as VX. Usually, these agents are absorbed by inhalation or by skin or mucosal contact, which will cause a certain toxidrome over time. Their differing solubility and vapor pressure determines their propensity for inhalative versus contact absorption. Knowledge of volatility, vapor pressure, and gas density will influence tactical consideration in triage and rescue efforts. Their different aging half-life has a major impact on whether specific and early antidote intervention with AchE enzyme-reactivating therapy is useful or whether patients will require ventilatory support. Early recognition of an epidemic toxidrome will help detect the presence of a certain toxin class. Early, readily available, mobile and highly specific chemical detection methods like GC/MS are pivotal elements in tactical rescue consideration, medical decision making, and resource allocation.
Conclusion: The rapid and specific chemical identification of individual toxic substances will guide and impact tactical rescue and medical decisions due to their different chemical, physical, and physiological profiles. Additionally, all healthcare and rescue personnel should be able to recognize toxidromes.
Keywords: nerve agents;organophosphates; toxidrome; toxin class; triage;
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Lessons Learned from Chemical Gas Leak at Esenboga Airport

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A package suspected of being contaminated with an NBC agent was found at the Ankara Esenboga Airport Cargo section on 10 February 2005. The Civil Defense was called on-site and responded with necessary equipment. Following decontamination, three people who been in contact with the suspicious package and another five people who had been in the room at the time of the contact were dispatched to SSK Diskapi Hospital. The dispatches were organized under the coordination of the Ankara EMS. Quarantine preventions were undertaken at the Emergency Service. Biological and chemical analysis of the material inside the suspicious package was performed. Chemical and biological detector scanning was conducted. The end of quarantine was announced to the public.

Lessons learned from this incident include: For emergency incidents, a system should be established to transmit information to a higher level coordination center and to start the process depending on the responses received from this center. A communication map should be formed that is functional in meeting the needs of the center.

Contaminated people should not be transported from the scene to another place. Response teams should be prepared to enter a contaminated scene. Decontamination units should exist at the entrance to the Emergency Services. All people who have any contacts at any levels of the medical treatments of the incident and cases should be aware and trained and approach the incident seriously.
Keywords: chemical release; contamination; coordination; decontamination; precautions
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Comprehensive Disaster Medical System for Newly Emerging Threat of Nuclear Disaster in Korea

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Introduction: The medical response system against nuclear disaster in Korea usually is focused on the regions located near nuclear power reactors, but recently, the newly emerging threat of nuclear disaster should be considered, due to the rise of nuclear, biological, and chemical terrorism and the change of the international political situation. Researchers examined and recommended the new comprehensive disaster medical system for the newly emerging threat of nuclear disaster.
Methods: The national disaster response system and the Emergency Medical Services (EMS) for nuclear disaster were reviewed and data from the preliminary study regarding the nuclear emergency medical system around the nuclear power plant were reorganized based on a risk assessment method. A questionnaire survey was conducted for experts in disaster response and EMS regarding the threat of nuclear disaster.
Results and Discussion: The primary EMS around the nuclear plants was considered to be good, but problems during nights and holidays were identified. Some of these problems could result in many injured victims. The systems for decontamination in receiving facilities were insufficient. Medical teams were not well-equipped with personal protection devices. The new system is based on the assumption that a nuclear disaster could happen anywhere, in any situation. This includes the scenario of urban radiological material leakage, nuclear contamination from a neighboring region, or

a mass panic state after the perception of a nuclear threat.
Conclusions: For the adequate response to the newly emerging threat of various nuclear disasters, new concepts and a new, comprehensive disaster medical system is necessary, as well as effective utilization of pre-existing resources.
Keywords: disaster response; emergency medical services; hospitals; nuclear disaster; personal protective equipment; preparedness
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Terrorist Radiological Dispersal Devices and Improvised Devices: A New Global Threat

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The events of 11 September 2001 have increased awareness of the dangers posed by terrorists gaining access to weapons of mass destruction and radioactive and chemical materials, as well as their means of delivery. The current resurgence of terrorism is part of a complex pattern of global changes and imbalances. It is crucial to analyze, prevent, and mitigate possible terrorist attacks, such as man-made disasters.

Nuclear, non-conventional weapons and devices are particularly suited to maximizing the number of casualties, and are more attractive to terrorists than are biological and chemical weapons. Therefore, nuclear or chemical explosion might be the next step in the escalation of terrorist attacks. The medical and healthcare infrastructure, as well as all other forces engaged in emergency responses, must be able to prevent and to treat illnesses and injuries resulting from chemical, biological, radioactive, nuclear, or explosive terrorism (CBRNE). Preparing the medical community to address these threats is a great challenge, but the consequences of being unprepared could be devastating. Preparedness must be implemented at national and international levels, with tight cooperation between countries and governments, and with a public health system program and a government policy of terrorism prevention plans. The aim of this paper is to attempt to analyze and understand a non-conventional nuclear or chemical device as a possible tool for use in a future terrorist attack.
Keywords: chemical device; explosive; nuclear device; preparedness; prevention; response; terrorism
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Session 3: Burns

Chairs: R. Kreis

The United Kingdom Burn Major Incident Plan: A Historical Mapping Exercise

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The United Kingdom National Burn Care Group published its Burn Major Incident Plan in 2006. It describes the planned multi-agency response to an incident involving a large number of burn casualties.

To carry out a form of validation for this plan, a historical mapping exercise was performed using previous European major incidents involving multiple burn casualties to assess how it might have performed. A literature search for public and official inquiries, peer-reviewed medical literature, and online print media was performed to obtain information about the injured and their dispersal from the scene. A total of nine major incidents with >30 burn patients were reviewed in detail. Only reports of three incidents provided sufficient information regarding casualty care to allow for detailed examination and "testing" of the 2006 plan. These three incidents were: (1) the Bradford Football Stadium Fire in 1985; (2) the Manchester Airport Plane Fire in 1985; and (3) the Nightclub fire in Volendam, the Netherlands in 2001. If the 2006 Burn Major Incident Plan was implemented in each of these situations, the impact of each event would be reduced to a manageable level by dispersing duties across units within the country. Clinical management details from major incidents are not well recorded. This is an issue that must be addressed and rectified. A national dataset-library using an Utstein-type template is essential. If a burn incident similar to the three reported incidents of this order were to happen in the UK, the 2006 Burn Plan would significantly improve the pathways to specialist care while not overwhelming the services.
Keywords: burn patients; major incident plan; mapping exercise; multi-agency response; United Kingdom
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The United Kingdom National Burn Plan

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The United Kingdom Emergency Planning Guidance recognizes that the capacity of the National Health Service (NHS) for significantly burned patients would be challenged by a major event involving multiple burn victims.

The National Burn Care Group has devised a response system by which specific burn care triage occurs at the site of the incident and/or the primary receiving Emergency Departments. The system also calls for burn qualified personnel to guide initial resuscitation and temporizing measures, while a suitable, fully equipped burn care bed is identified through the National Burn Bed Bureau.

The plan will be activated following the recognition that an incident with multiple burn victims has occurred. The local Burn Service will stop direct transfer of all referred cases and apply a form of triage, before matching patients to appropriate definitive care facilities.

Burns Assessment Teams (BATs) will be mobilized from the primary receiving Burn Service or, by mutual-aid arrangements, from adjacent services. Personnel from the BATs will perform the initial assessments and make treatment recommendations, while providing information to the control point. Once the national burn bed status has been determined, the local ambulance service, potentially aided by the receiving services, will manage the dispersal of the patients to units across the country.

The plan has been adopted by the UK Department of Health to ensure that burn victims receive high-quality, specialist care at the earliest opportunity, and are admitted