EDUCATION AND TRAINING OF HEALTH CARE PROVIDERS IN THE FIELD OF EARLY WARNING SYSTEMS AND SOPS FOR ACCIDENTAL/DELIBERATE RELEASE OF PATHOGENS - PRESENT SITUATION IN BULGARIA

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REZUMAT
Centrul național de referință pentru boli infecțioase și parazitare este o structură importantă în cadrul Schemei de supraveghere a bolilor transmisibile din Bulgaria. Constituind baza Laboratorului național de referință pentru agenți patogeni bacterieni din grupul 3, semnificația sa este crucială în cazul suspiciunii unui atac bioterrorist. Sunt descrise acțiunile întreprinse în cazul oricărei situații de criză, inclusiv eliberarea accidentală sau intenționată de agenți patogeni pentru om. Educația și pregătirea personalului medico pentru astfel de situații reprezintă activități de rutină ale Centrului dar punem accentul pe rezultatele Controlului Extern de Calitate care arată variabilitatea în ceea ce privește gradul de pregătire și necesitatea pregătirii frecvente la nivel regional.

Cuvinte cheie: agenți patogeni bacterieni din grupul 3, bioterrorism, supraveghere

ABSTRACT
The National Center of Infectious and Parasitic Disease is an important structure in the Surveillance Scheme for Communicable Diseases in Bulgaria. Being base for the National Reference Laboratory for Group 3 Bacterial Pathogens its significance is crucial when bioterroristic threat is suspected. The actions undertaken in case of any crisis situation, including accidental or deliberate release of human pathogens are described. The education and training of health care providers concerning such situations are routine activities of the Center but we emphasize on the results from the External Quality Assessment which shows variations in the regional preparedness and the need of frequent training.

Key Words: group 3 bacterial pathogens, bioterrorism, surveillance

The National Center of Infectious and Parasitic Diseases (NCIPD) was founded in 1881 thanks to the Rockefeller foundation donation and presently is one of the leading institutions in the Bulgarian public health care system. It has the statute of a scientific organization with broad spectrum of activities: scientific research, application of new technologies, primary and reference diagnostics of infectious diseases, educational activities, special laboratory production (culture media, diagnostic reagents, etc.).

NCIPD consists of five departments: Bacteriology, Virology, Parasitology, Epidemiology, Immunology and Biotechnology, comprising 48 laboratories and a total of 88 scientific researchers. Fundamental and applied research concerning diagnostics, treatment and prophylaxis of infectious and parasitic diseases is carried out in the Center. This work is in close relations with the other health care institutions in the country.

The National Reference Laboratory for Group 3 Bacterial Pathogens (NRL GG3BP) was founded 50 years ago and since 1982 became a part of the Bacteriological department of NCIPD. At present it is the only civil laboratory in the country to establish confirmative diagnosis of cholera, anthrax, tularemia, brucellosis and plague. In 2003 the laboratory was renewed and supplied with new equipment according to the Bulgarian regulations. The basic activities of the laboratory are: microbiological diagnosis of V. cholerae, B. anthracis, F. tularensis, Brucella spp. and Y. pestis; introduction of new diagnostic methods;
scientific research work; post graduate training; participation in the surveillance of outbreaks caused by the above mentioned bacteria and analysis of suspected biothreat (BT) samples.

**Figure 1. Regional Inspectorates for Protection and Control of Public Health.**

The surveillance of the communicable diseases in Bulgaria is carried out on regional base. The country is divided into twenty-eight regions and each of them has its own Regional Inspectorate for Protection and Control of Public Health (RIPCPH). (Fig. 1) Parts of their structure are the Communicable Diseases and Laboratory Departments. RIPCPHs are subordinated to the Ministry of Health and work in close relationship with NCIPD and other public health care institutions. Primary materials and strains for confirmation from the regional laboratories are received at the Reference laboratories of NCIPD. All materials and strains suspected for anthrax, tularemia, brucellosis, plague, cholera and also suspected BT samples are sent to the NRL G3BP. According to the Bulgarian legislation the Surveillance Scheme for Communicable Diseases (including tuberculosis and HIV infection) is structured on three levels.3 (Fig. 2)

Medical doctors and biologists from the twenty-eight regional laboratories and also other public health specialists are annually trained in post graduate courses organized by the NRL G3BP. We focus on the classical microbiological methods (cultural, serological and biological), rapid methods for detection (immunofluorescence method and polymerase chain reaction) and also analysis of suspected BT samples.

In order to improve the readiness of the health care providers to manage emergency situations caused by the above mentioned bacterial pathogens we carry out an External Quality Assessment for direct immunofluorescence method. The results from the first two distributions were not good, as could be seen on Table 1 (without agreement - fourteen and twelve laboratories, respectively). In our opinion this is due to the lack of experience. The regional laboratories

**Figure 2. National Surveillance Scheme for communicable disease (RHC - Regional Health Center, NCHI - National Center for Health Information).**
do not use this method on a frequent basis because of lack of trained personnel. Also in some of the laboratories appropriate equipment is not available. For this reason in 2004 and 2005 NCIPD organized four training courses and after which the microbiologists became more familiar with the technique and the result interpretation. In 2006 we observed again worse results. After analysis it was found out that this was due to the fluctuation of man power, especially the trained ones. The participants who did not attend the training courses showed results permanently without agreement. At present, in Bulgaria there is no regulation to make these courses mandatory for RIPCPh laboratories.

**Table 1.** Results from External Quality Assessments for direct immunfluorescence implemented in the regional laboratories.

<table>
<thead>
<tr>
<th>Year</th>
<th>Distribution</th>
<th>No. Labs</th>
<th>Complete agreement</th>
<th>Partial agreement</th>
<th>Without agreement</th>
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<td>June</td>
<td>19</td>
<td>2</td>
<td>5</td>
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<td>13</td>
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**Figure 3.** National structure of the crisis management.
In case of any crisis situation in the country, an operative plan is created. (Fig. 3) An emergency team is set up in which Civil Protection Agency, National Centers and different Ministries according to the character of the emergency situation are included. All actions undertaken are conducted by the Permanent Commission for Disaster Management which is subordinated to the Ministry of Disaster Management Policy.

When deliberate release of highly infectious bacterial agents is suspected the peripheral structures (general practitioners, hospitals and etc.) inform the emergency section of the corresponding RIPCPH which in its turn contacts with the key person in NCIPD. He/she organizes an emergency team which includes specialists from Communicable Diseases and Laboratory Departments of the Center and also contacts with the Ministry of Health which expands the emergency team with different medical specialists needed. On National level the Permanent Commission for Disaster Management and other Ministries are informed. (Fig. 4)

All measures taken in NRL G3BP in case of accidental release of infectious material are according to the Internal Standard Operational Procedures.\textsuperscript{2,4} The laboratory staff must follow all necessary steps and inform the Head of the laboratory for any release of infectious material. The Head of the laboratory organizes and controls the immediate actions and contacts with the Head of the Microbiology Department who informs the NCIPD Permanent Commission for Disaster Management. The members of the commission are ready for a short period of time to switch over their everyday activities to fulfill all measures concerning an emergency situation.

Further the information goes to the Director who manages and controls all necessary activities. If the assessment of the situation shows a possible threat for the citizens, Municipal Commission for Disaster Management and the Police are also informed. (Fig. 5)

Taking in consideration the terrorist acts in USA and other countries of the world, biological threat becomes a problem of the day. The accidental or deliberate release of pathogens may cause serious
health, economic and environmental damages. In this aspect, the education and training of health care providers is critical step for preventing the spread of high medical risk infections among the community. Adequate and continuous training programs for “train the trainers” among different countries and first line responders are needed.

ACKNOWLEDGEMENTS

The author thanks Dr. Lilly Marinova and Mr. Viktor Bogatinov for the supplied data.

REFERENCES

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