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Column

RISK FACTORS AND DELAYED EFFECTS OF BOTULISM IN THE REPUBLIC OF ARMENIA

Botulinum toxin is a Category A bioterrorism agent and therefore comprehensive understanding of variations in clinical syndrome, management, practicability of rapid diagnosis, strain-specific variations in pathogenicity and molecular epidemiology are desirable. A considerable attention should be paid to the country preparedness to respond to possible use of Botulinum toxin as a bioterrorism agent through inter-sectoral cooperation and coordinated actions between civil and military health services.

Study significance and objectives:

Ingestion of the toxins produced by Clostridium botulinum causes a severe neuroparalytic illness that can be life-threatening. While the acute clinical syndrome is well-described, little is known about the long-term consequences of botulism. In one study of pulmonary complications a year after an outbreak of botulism with 34 cases, 68% of patients suffered from easy fatigability and 46% suffered from exertional dyspnea. Similar findings were found in a study measuring outcomes two years after the illness. Patients have also been found to suffer psychosocial dysfunction that lasted at least three years after their illness, a finding that is independent of the severity of their illness. However, the literature on long-term outcomes is sparse, with no studies of complications after more than three years following the illness.

The Republic of Armenia is thought to have one of the highest incidences of botulism in the world and the study of patients in this area could serve as a unique source of information on long-term sequelae associated with botulism intoxication.

Investigators/collaborators:

The Armenian National Institute of Health (ANIH) and the Yerevan State Medical University (YSMU), in collaboration with the United States Centers for Disease Control and Prevention (US CDC), is conducting a 3-year project to improve botulism surveillance, diagnosis, and control.

Investigators include epidemiologists from the ANIH, YSMU, the Armenian Center for Disease Control and Prevention (ACDC), and Nork Infectious Hospital in Yerevan, Republic of Armenia, and epidemiologists from the Enteric Disease Epidemiology Branch, National Center for Zoonotic Vector Borne and Enteric Diseases, CDC in Atlanta, Georgia, USA.

Clinical study methods:

In 2007 case-control study in the Republic of Armenia we interviewed and examined people who had botulism in a period of 2000 - 2007 and compared certain aspects of their physical and mental health to those of people who have not had botulism. Investigators also conducted physical exams on a subset of case-patients and controls, in order to document objective measures of physical impairment. Such comparison will allow us to better define the long-term sequelae associated with botulism.

Clinical study results:

The outcomes of interest include residual physical, neurological, respiratory, and psychosocial impairment, as well as any impairment in ability to conduct activities of daily living.

Preliminary clinical study results:

A retrospective clinical case review of all patients diagnosed with botulism between 1995 and 2007 in the Republic of Armenia will provide an opportunity to:

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• *Identify basic demographic and epidemiologic data on botulism cases in Armenia;*

• *Define clinical syndrome predictive of survival that could help in a recourse poor settings (at regional level) to identify low-risk patients to provide them immediate medical care; patients with botulism routinely transported to Yerevan (capital), regardless of antitoxin stocked in all regional Sanitary Epidemiological Stations (SESs) and most hospitals staffed and equipped to provide advanced medical care. Prospective validation of this clinical prediction rule could help reduce the need for costly, time-consuming transportation for a sub-group of low-risk patients. Similarly, patients presenting clinical predictors of poor outcomes (respiratory compromise, death) should be immediately transferred to higher-level facilities early in the course of disease;*

• *Estimate the financial burden of disease in terms of treatment costs.*

Conclusion:

The information gained from our collaborative project alowed to:

1. *Define and control highly endemic botulinum intoxication in Armenia*
2. *Enhance botulism diagnostic capacity in Armenia;*
3. *Document the clinical syndrome(s) and outcomes of botulism caused by strains of C. botulinum native to Armenia;*
4. *Control hyper-endemic botulism in Armenia;*
5. *Broaden the foundation for future scientific collaboration between scientists in Armenia and the U.S.*

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