

# Cuban Epidemic Neuropathy

## An update

An international conference was held in Havana, Cuba, from 12 to 15 July 1994, to review the most significant findings of the latest studies on Cuban epidemic neuropathy (CEN).

By 31 May 1994 the total number of cases had risen to 50,945, with a prevalence rate of 462 per 100,000. Of that total 23,073 (45.3%) were of the optic form and 27,872 (54.7%) of the peripheral form. Among patients who had the optic form, 49% experienced full recovery with one of the various forms of treatment. However, 28.6% show some improvement but still have visual deficiencies, while 22.4% are still experiencing visual problems. Of those who had the peripheral form, 42% recovered fully, 29.3% show partial improvement, symptoms persisted in 24.6% and the situation has worsened in 4.1%.

Until the 10th of July of this year, there were only 102 new cases, basically of the peripheral form. The highest number of cases continues to be reported in Pinar del Río and Cienfuegos, and there are provinces that have had no cases this year. Of these new cases, 27.5% are of the optic form and 72.5%, of the peripheral form.

Over 300 people attended the Conference, where general reports were presented in plenary session. The participants were then divided into working groups in related areas such as virology, clinical medicine (neurology and ophthalmology), nutrition and toxicology, and the general management of CEN. Each research group presented its respective findings. The principal research projects discussed were:

**Clinical pathology:** The clinical characterization of CEN; multicenter clinical trials with 11 treatment groups in patients with CEN; sural nerve biopsies in 33 patients with CEN; hematological and immunological assessment of the acute phase in cases and controls.

**Epidemiology:** Descriptive study in children under 15 years of age; nationwide descriptive study in young people aged 15 to 24; nationwide case-control study in the adult population; case-control study on Isla de la Juventud; descriptive study of CEN patients in Pinar del Río; case and control study in the province of Pinar del Río; case-control study in selected municipalities; joint case-control study with the CDC (Atlanta, GA, United States) in the province of Pinar del Río.

**Nutrition:** Study of food availability and distribution in Cuba in the period 1989-1992; dietary factors in CEN on Isla de la Juventud; anthropometric and biochemical study of CEN.

**Biological agents:** Analysis of blood and cerebrospinal fluid in cases and controls; isolation of virus in lactating mice (intracerebral and subcutaneous method); isolation of virus in rabbits inoculated retro-orbitally and intravitreously; electron-microscopy of supernatants from VERO cell cultures and human fibroblasts infected with Cerebro-Spinal Fluid (CSF) samples from patients; nucleic acid study of viruses isolated from the CSF of patients; ascertainment of viral proteins in the sera of both the sick and the healthy; computer study of sequence homology and protein engineering;

serological studies of neutralizing antibodies and immunoglobulin M in cases and controls; seroprevalence study of viral antibodies in the population; study of the interferon systems against the viruses isolated; study of HTLV-I and II in the sera of patients; studies of enterovirus ribonucleic acid in biopsies of nerve tissue from patients with CEN.

**Toxicology:** Case-control studies of potentially toxic substances in biological samples; studies of potentially toxic substances in food, tobacco, and alcoholic beverages; studies of genotoxicity in cases and controls.

The main findings of this research lead to the following conclusions:

1. CEN is a clinical syndrome with two basic forms, the predominantly optic and the peripheral. It has a variable latent period, with clinical manifestations that have been described previously. Biopsies have revealed primarily axonal lesions related to the nerves that consume large amounts of energy. No alterations were found in terms of humoral and cellular immunity, specific acute response, coagulation, or other blood parameters. There was evidence of reduced levels of iron and B-complex components.

2. There have been no fatalities attributable to CEN.

3. The risk to children, adolescents, the elderly, and pregnant women was very low. Both sexes were affected.

4. Greater risk of CEN was associated with diminished frequency, quality, and quantity of food consumption. The proportion of carbohydrate intake had risen, while consumption of proteins of animal origin had fallen. Moderate deficiency in some vitamins (A, B1, B2) was found.

5. Alcohol consumption and smoking were the factors associated with highest relative risk in the case-control studies. No association with exposure to pesticides was found. The frequency of occurrence of cases within the same household was very low, and no temporal-spatial case groupings were observed.

6. Coxsackie virus was found in the CSF of patients. Viral ribonucleic acid was identified in the CSF of patients, as in inoculated mice. The possible presence of the Inoue-Melnick virus should also be mentioned.

7. The study of zinc, manganese, iron, calcium, magnesium, iodine, and sodium content in food and phosphates in plants yielded normal values. Some foods that are routinely consumed (beans, rice, potatoes, and cassava) have selenium values below the recommended levels. Low levels of carotenoids (alpha and beta carotene, lycopene) were found in the cases, compared with the controls.

A comprehensive explanation of the etiology and behavior of CEN is still not in the offing. The Ministry of Public Health of Cuba has responded to the problem in an integrated, multisectoral, and interdisciplinary manner. PAHO has served as a catalyst for the support of the international scientific community and has been recognized by the Government of Cuba for this action.

Source: Division of Health Promotion and Protection, Program for Health Promotion and Social Communication, HPP/HPS, PAHO.