Human Herpesvirus Type 6 and Chronic Fatigue Syndrome

We have each been the senior author of separate, recently published articles, one in the August 1992 issue of the ARCHIVES[1] and another in the January 15, 1992, issue of the *Annals of Internal Medicine*,[2] involving tests for human herpesvirus type 6 (HHV-6) in patients living in the Lake Tahoe region of California who developed an illness resembling the chronic fatigue syndrome. Questions have arisen regarding how the two articles relate to one another.

The primary purpose of the article in the ARCHIVES was to document the heterogeneity of clusters variously designated as epidemic neuromyasthenia, epidemic chronic fatigue syndrome, or other condition. This article also described the long-term outcome in those individuals, and a search for evidence of retrovirus infection, which proved to be negative. As part of the study reported in the ARCHIVES, antibody titers to HHV-6 were determined in 27 patients.

The primary purpose of the article in the *Annals* was to describe the laboratory features of a large group of patients who satisfied the most important criteria for chronic fatigue syndrome. This study included sporadic cases as well as individuals from two of the four "clusters" reported in the ARCHIVES article. The article in the *Annals* measured antibody titers to HHV-6 in 134 patients, including 11 of those included in the ARCHIVES study. In addition, the *Annals* article reported studies of *active* HHV-6 infection, using primary cell cultures from the lymphocytes of 113 patients; these studies were supplemented by the use of monoclonal antibodies to detect HHV-6 proteins, polymerase chain reaction to detect HHV-6 nucleic acid, and viral isolation studies.

In both articles, antibody levels to HHV-6 were 50% higher in patients than in healthy control subjects, although the differences did not achieve statistical significance. The studies reported in the *Annals* found evidence of active HHV-6 infection in 70% of patients vs 20% of control subjects ($P<10^{-8}$).

Thus, the two articles are consistent with one another, and support the hypothesis that HHV-6 was reactivated in the patients studied; since most human beings are permanently infected with HHV-6 early in life, new, primary infection with the virus is unlikely to have been occurring in these patients. Whether the reactivation of HHV-6 contributed to the morbidity of the illness cannot be determined by either of the two studies.

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Acupuncture for Reflex Sympathetic Dystrophy

Reflex sympathetic dystrophy (RSD) is a frequent condition, usually occurring after trauma of the extremities characterized by pain, swelling, and dystrophy. Its pathophysiology is poorly understood, and no universally accepted treatment exists.[1] We have tried classical acupuncture in a randomized, placebo-controlled pilot project on 14 patients with recent (less than 4 months) onset. Diagnosis was made clinically and was confirmed by scintigraphy in all cases. Group A received classical acupuncture five times per week for 3 weeks by an experienced acupuncturist (O.C.). Group B received sham-acupuncture, which meant that needles were inserted outside acupuncture points by the same acupuncturist. As the clinical evaluators (V.F. and Y.A.) were also blinded, the trial adhered as closely as possible to a double-blind protocol.

Both groups demonstrated a reduction of pain, as measured by visual analog scale (0 through 100) during the 3 weeks' treatment. In group A, the average reduction was from 57.8 ± 1.8 to 17.9 ± 2.4, while in group B, it fell from 55.4 ± 1.9 to 28.6 ± 1.9. Similarly, patients rated real acupuncture more effective than the sham procedure throughout the study.

This pilot study, therefore, implies that acupuncture might alleviate symptoms of RSD. Due to the small number of patients, we did not feel that testing the results for statistical significance was justified. Others[2] have suggested acupuncture for RSD purely on an empirical basis. To our knowledge, this is the first scientific attempt to classify its

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effectiveness in RSD. We feel encouraged to continue this project and recruit more patients. If acupuncture is proven to benefit patients with RSD, one might consider whether its mechanism is the preservation of an appropriate opioid bias in the regional sympathetic ganglia[3] or a reduction of sympathetic tone in the affected limb.[4]

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Fatal Right Ventricular Infarction in Association With Contraceptive Pills, Without Coronary Disease

We describe to our knowledge, a first case of death from right ventricular infarction (RVI)[1] in association with contraceptive pills and smoking, but not coronary atherosclerosis, in a young woman.

Report of a Case. A 26-year-old woman, a smoker, had been taking contraceptive pills containing 20-μg ethinylestradiole and 150-μg desogestrele for 31 months. She had been healthy except for previous toxemia of pregnancy.

Without previous symptoms and after sudden chest pain and dyspnea while climbing stairs, the patient fell unconscious. After several direct current shocks due to ventricular fibrillation, she was deeply comatose and hypotonic. An electrocardiogram showed a sinus rhythm with 105 beats per minute, a right bundle-branch block, and a Q wave in lead V_3R with an ST-segment elevation. The chest roentgenogram was normal. The MB fraction of serum creatine kinase was 281 U/L (normal, <24 U/L). A lung perfusion scan revealed bilateral perfusion irregularities, but arterial oxygen tension was 431 mm Hg, while the patient was breathing 80% oxygen.

Thrombolytic therapy was started 9 hours after the initial symptoms because of some suspicion of pulmonary embolism. After 2 hours and receiving 0.42 million units of streptokinase, streptokinase treatment was discontinued because of a hopeless situation. The patient was apneic, hypotensive, hypothermic, and oliguric. Death ensued 12 hours later.

At autopsy, an acute myocardial infarction was ascertained in the septal papillary muscle of the tricuspid valve and in the subendocardial layer of the right-sided posterior interventricular septum. The infarction was confirmed by microscopy. The coronary and pulmonary arteries were normal. The foramen ovale was closed. There were no thromboses in the cardiac chambers, in the veins of the lower extremities, or in the pelvic veins.

Comment. In this young woman, RVI induced ventricular fibrillation with anoxic brain damage and a lethal outcome. The findings of the lung scan were probably attributable to disturbances in pulmonary perfusion due to circulatory failure.[2]

Contraceptive pills are associated with myocardial infarctions especially in female individuals who smoke.[3] Previous toxemia of pregnancy is also a risk factor of myocardial infarction in association with contraceptive pills.[3] In this patient, myocardial infarction may have been provoked by a spasm or thrombosis, possibly secondary to a spasm[4] in the patent right coronary artery, in the territory of the infarction.[5] A small dose of 0.42 million units of streptokinase might have helped endogenous fibrinolysis to dissolve a coronary clot.

Our case demonstrates that RVI can occur in the absence of left ventricular free wall infarction, coronary artery disease, or right ventricular overload due to increased pulmonary artery pressure usually seen as a predisposing factor.[1] We suggest that smoking and contraceptive pills were probably important triggers for the fatal event in this young woman.

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