

67 Chronic Fatigue Syndrome (CFS) patients with CFS (diagnosed both by the 1988 and 1994 Centers for Disease Control & Prevention (CDC) criteria) were screened for the study. Mitral valve prolapse (MVP) was not an exclusion criterion in the CFS and control groups. Patients and 78 non-CFS controls were younger than 50 and did not have any known heart or circulatory condition.

Controls were taken from patients seeking cardiac consultation for palpitations, chest pain or light-headedness. On the other hand, the 67 patient study sample was taken from an infectious disease practice, so patients were not pre-selected (apparently) for cardiac symptoms.

A higher number of controls had mitral valve prolapse than the CFS patients (35% vs. 12%). The percentage occurrence of MVP in the CFS patients is similar to MVP in the population at large, while the increased MVP percentage in the control group may account, partially, for their seeking assistance at the cardiological practice.

[Massachusetts CFIDS/ME & FM Association Comment: The prevalence of MVP between the two groups is important in interpreting the study's results. The finding that CFS patients have a higher rate of abnormalities by Holter monitoring indicates that such abnormalities are not due to MVP, since, if so, one would expect a higher rate of MVP similar to the control group. Moreover, the researchers assert, in the study reviewed immediately below, "New Cardiomyopathy: Pilot Study of Intravenous Ganciclovir in a Subset of the Chronic Fatigue Syndrome":

"Mitral

valve prolapse without mitral valve insufficiency does not cause abnormal or wave oscillations at Holter monitoring

."]

Both groups were subject to 24-hour Holter monitoring to measure cardiac function.

"The prevalence of both T-wave inversions (CFS 61% vs. 34%, $P=.01$) and T-wave flattenings (CFS 96% v. 71%, $P=.01$) were significantly different between the two groups."

In an earlier study ("Repetitively Negative Changing T waves at 24-hour Electrocardiographic

Monitors in Patients with CFS," *Chest* 104 (1993): 1417-21), Lerner found that "In CFS patients, oscillating abnormal T-waves were regularly seen with the onset of sinus tachycardias, and the abnormal T- waves typically then resolved with the reappearance of normal sinus rhythms."

The two studies indicate that intermittent tachycardia, documented by Holter-monitoring T-wave abnormalities, is a frequent symptom of CFS. "This study confirms our earlier report that CFS patients uniformly have abnormal oscillating T-wave flattenings and T-wave inversions by Holter-monitoring. " They found 12-lead standard ECG's and 2-D echocardiograms did not generally show the cardiac abnormalities in CFS patients.

As part of the study, 9 CFS patients submitted to endomyocardial biopsies (the taking of heart tissue for examination). 8 of the specimens showed no active myocarditis (inflammation of heart muscle), mitochondrial abnormalities, and other pathological changes. Additionally, 7 of the biopsied patients also had electron microscopic studies (tissue samples examined under electron microscope). Six patients showed various electronmicroscopic myofiber abnormalities. *[Cautionary note: These changes were noted in a very small number of CFS patients.]*