

## Symptoms Predict the Outcome of Tilt Table Testing in CFS/ME/FM

Charles W. Lapp, MD, Laura Black MD, and Rebekah S. Smith  
Hunter-Hopkins Center, Charlotte, North Carolina

Chronic Fatigue Syndrome and Fibromyalgia are frequently associated with orthostatic intolerance [Ref 1], including Postural Orthostatic Tachycardia Syndrome [Ref 2], Symptomatic Orthostatic Tachycardia Syndrome [Ref 3], and Neurally Mediated Hypotension [Ref 4]. It is costly and time consuming to perform tilt table testing on every person with CFS/ME/FM, so it would be ideal to find a screening exam to determine beforehand which patients would be most likely to have a positive result. Simple orthostatic blood pressure measurement is inadequate because the orthostatic symptoms in CFS/ME/FM are usually delayed [Ref 5]. Simply having the subject stand still while BP and HR are monitored can suggest orthostatic instability if there are increases in symptoms or HR, or a precipitous fall in BP. However, this can be dangerous because some subjects faint abruptly or develop prolonged asystole under such circumstances, so they are best studied in a laboratory equipped to handle these contingencies.

We undertook to see if certain symptoms would predict a positive tilt table test. We retrospectively examined the records of 104 persons studied in our Cardiovascular Laboratory during the 16 month period from December 20, 2001 to March 20, 2003. Subjects included 91 females and 13 males, ages 13 to 71 years. All new patients with CFS and/or FM were recommended to undergo passive tilt table testing unless they had medical contraindications to the study, were unable to stand for up to 30 minutes, or they were hypertensive. Passive tilt table testing was performed according to the technique of Bou-Houlaigah at Johns Hopkins Hospital [Ref 6], except that no IV or IV challenge was used.

The disorders we examined fell into three groups: Syncope (a past or recent history of fainting), autonomic symptoms, and general symptoms. Autonomic symptoms included nasal congestion, palpitations, non-anginal chest discomfort, recurrent queasiness, bowel and/or bladder incontinence, nocturia (more than twice nightly), generalized flushing, and excess or abnormal sweating. General symptoms included dizziness or lightheadedness, dysania (prolonged stiffness and fogginess upon arising), occipital headache, and inability to stand in place.

A positive tilt table test was obtained in 81% of subjects studied, and the test was totally negative in 19%. NMH was observed in 42% of patients. Remarkably, a prior history of fainting was *not* the most helpful predictive symptom, with a sensitivity of 77%. The Negative Predictive Value (NPV) was 86%. Thus, a history of prior fainting is supportive, and the absence of prior syncope would argue against testing. The best predictor of a positive tilt test was "inability to stand," with a sensitivity of 81% and a NPV of 76%. Flushing and nocturia also had reasonable sensitivities at 79% and 78%. Symptoms of dizziness, dysania, and occipital headache were almost universal in this patient population, with prevalences of 80%, 76% and 60% respectively. Thus these were of little predictive value. The specificity, positive predictive value, and negative predictive value of the remaining symptoms were not good.

In summary, the high positivity rate for orthostatic intolerance (82%) and NMH (42%) argue for tilt table testing in the majority of patients with CFS/ME/FM, since these conditions are potentially treatable. The best predictors of a positive test are inability to stand in place, fainting, and flushing. Combined, these three predictors have a sensitivity of 71% and a negative predictive value of 75%. Thus a history of fainting, flushing, and postural weakness [falling, failing, frailty] reasonably predicts a positive passive tilt table test, and their absence reasonably predicts that the test will be negative. The authors argue for tilt table testing in the majority of persons with CFS/ME/FM, especially when fainting, flushing, and postural frailty are present.

## REFERENCES

1. Martinez-Lavin M, Hermosillo AG, et al., "Orthostatic sympathetic derangement in subjects with fibromyalgia," *J Rheumatol* 1998 Apr; 25(4):823-825
2. Low PA, et al., "Postural tachycardia syndrome (POTS)," *Neurology* 1995 Apr; 45 (4 Suppl 5): S19-25.
3. Lapp CW, "Neurally Mediated Hypotension and Symptomatic Orthostatic Tachycardia in CFS," AACFS Clinical & Research Conference, San Francisco, October 1996
4. Bou-Houlaigah I et alia, "The relationship between neurally mediated hypotension and the chronic fatigue syndrome," *JAMA* 1995; 274:961-967
5. Streeten DH and Anderson GH Jr, "Delayed orthostatic intolerance," *Arch Int Med* 1992; 152: 1066-1072.
6. Personal communication with Dr. I. Bou-Houlaigah, 1996

Special Data For  
Symptoms Predict the Outcome of Tilt Table Testing in CFS/ME/FM

DISORDER	Fainting	Inability to stand	Flushing	Nocturia
Sensitivity	77%	81%	79%	78%
Specificity	21	21	20	20
Pos Pred Value	12	27	36	39
Neg Pred Value	86	76	62	57

Underlying Disease Process (n=104)

CFS Alone	30
CFS + FM	58
FM Alone	16

Percentage of persons with CFS who also had FM =  $58/88 = 66\%$

Percentage of persons with FM who also had CFS =  $58/74 = 78\%$

Various Tilt Table Results (n=104)

Orthostatic intolerance	18	17%
SOTS with something	61	
POTS with something	29	
NMH	44	42%
Negative	19	18%
SOTS + POTS	29	
SOTS alone	32	
SOTS/POTS/NMH	67	64%
All	85	82%