Latency(ms)	30.3±1.7
Amplitude(mv)	9.8 <u>+</u> 6.1
M-wave(mv)	<b>24.6±6.6</b>
HM ratio	0.4 <u>+</u> 0.2
H-vib	4 <b>2</b> .9±18.2
H-TA	<b>39.9<u>+</u>31</b> .1

**Table 3.23.** Normal values of soleus H reflex in adults (Misra and Pandey 1994)

H-vib = Vibratory inhibition

H-TA = Inhibition on contraction of tibialis anterior

## **Clinical Application**

H reflex has the advantage of evaluating the proximal sensory and motor pathways. It is therefore especially helpful in the evaluation of plexopathies and radiculopathies (Fig 3.77). In Guillain Barre syndrome, H reflex may be absent, delayed or dispersed. In S<sub>1</sub> radiculopathy the soleus H reflex may be absent; similarly flexor carpi radialis H reflex may be abnormal in C<sub>6</sub>-C<sub>7</sub> radiculopathy.

## H Reflex in Central Nervous System Disorders

H reflex is influenced by a number of spinal (Fig 3.78) and supraspinal variables (Fig 3.79). The H reflex studies, therefore, provide valuable information which are helpful in understanding the pathophysiology of various central nervous system abnormalities. These studies, however, are of limited clinical application. The recovery and excitability curves of H, HM ratio, vibratory and reciprocal inhibition have been studied in CNS disorders.

## **Clinical Application**

The latency of F wave can be a sensitive measure in polyneuropathy. F wave may be abnormal when distal motor conductions are unremarkable (Walsh et al 1984). Prominent slowing of F waves has been reported in GB syndrome where the demyelination may affect the proximal segment of nerve and even the roots which cannot be assessed by routine nerve conduction study (Fig 3.84; Kimura and Butzer 1975). F latency is abnormal in various types of peripheral neuropathies, proximal nerve injury and radiculopathies. Slowing of F waves in the presence of normal distal motor conduction points to a proximal nerve or root



Fig. 3.84. Median F wave in a patient with acute demyelinating neuropathy. Minimal F wave latency is prolonged (40 m with increased chronodispersion.

lesion and suggests the need for further investigations. F response may be absent or its persistence may be reduced in GB syndrome, proximal nerve or root injury and in amyotrophic lateral sclerosis (ALS). In ALS, reduced persistence of F wave is attributed to anterior horn cell loss, because it is correlated with decrease in M wave amplitude. Increase in the number of identical F response is consistent with decreased number of motoneurons capable of responding to antidromic stimulation. Increased identical responses have been reported in ALS and cervical myeloradiculopathy. An increase in the percentage of the responses following 100 supramaximal stimuli containing recurring (repeater) F waves have been found to be a sensitive measure of the carpal tunnel syndrome (McLeod 1987). Chronodispersion of F wave may be increased in polyneuropathies, especially in demyelinating neuropathies. The chronodispersion is reduced with conduction block (Panayiotopoulos 1979; Shivde and Fisher 1988). F wave chronodispersion recorded from calf muscles has been found to be increased after standing compared to prior resting in patients with lumbosacral radiculopathies (Tang et al 1980). In CNS lesions, decrease F amplitude and persistence are noted in the early stage of upper motor neuron lesions, which correlate with hyporeflexia and hypotonia (Eisen and Odusotek 1979); whereas F amplitude, persistence and FM ratio are increased in the chronic stage (Eisen et al 1977; Fierro et al 1990)). The F wave latency, may be prolonged while duration and amplitude have been reported to be increased in upper motor neuron lesion in another study (Fisher 1992). F wave parameters have been reported to be more precise for assessment of segmental motoneuron excitability than the well known T and H reflexes (Milanov 1992). These results are consistent with increased central excitability. The F waves provide additional information about the pathologies of both central and peripheral nervous system. Latency changes are useful in peripheral nerve and root lesions. FM amplitude ratios are increased in both peripheral ampring as well as spasticity. The changes in F response should be interpreted in the clinical context.