Acute Evaluation and Management Strategies in Suspected Transverse Myelitis (TM)

David Irani, M.D.
Assistant Professor of Neurology
The Johns Hopkins University
School of Medicine

Interrelated Issues

- Presenting signs and symptoms
- Early diagnostic efforts
- Acute management strategies
  - -therapy directed at the disease process
  - -symptom management
  - -prevention/treatment of complications
- Prognostic features
- Transition from acute to ongoing care

Acute Myelopathies: Common Clinical Features

- Absence of any preexisting neurologic disease
- Often heralded by some antecedent event (trauma, infection, immunization, etc.)
- Deficits that can progress rapidly over hours to a few days
- Bilateral involvement of motor, sensory, and autonomic pathways
- "Transverse": an upper anatomical limit above which spinal cord function is preserved

Acute Myelopathy: The Patient's History

- Antecedent events
- Pre-existing medical conditions
- Interval from first symptom onset to nadir
- Type(s) of early symptoms
  - -pain
  - -bowel/bladder dysfunction
  - -motor vs. sensory involvement
- Additional symptoms not referable to the cord

Acute Myelopathy: The Patient's Examination

- Upper level of spinal cord involvement
  (is there a risk of respiratory compromise?)
- Symmetry of motor and sensory deficits
- Partial vs. complete syndromes
  ("spinal shock")
- Sphincter disturbances
- Simultaneous brainstem, cerebellar, and/or cortical involvement?

Initial Diagnostic Efforts (Within 24-48 Hours)

Spinal imaging (MRI)
- rule out compressive (surgical) lesion
- assess upper level of involvement
- help in prognostication?

Cerebrospinal fluid (CSF) analysis
- confirm inflammatory changes
- (determine causation)
- help in prognostication

Acute Management (Within 24-48 Hours)

- Surgical consultation for compressive lesions
- Corticosteroids
  - IV methylprednisolone (1 gm/day x 5-7 days)
  - oral prednisone taper
- Prophylaxis against potential complications
  - (bowel/bladder, pulmonary, skin, venous thrombosis, musculoskeletal)
- Treatment of acute symptoms (pain, bowel/ bladder, spasticity)

Subsequent Diagnostic Evaluation (>48 Hours)

- Brain MRI
- Serologic testing (connective tissue disorders, vitamin B12 deficiency, HIV/HTLV-1/Syphilis/ Lyme infections, sarcoidosis)
- CSF analysis (Lyme/Syphilis/HTLV-1 serology, viral PCRs, IgG index and oligoclonal bands, angiotensin converting enzyme)

- Other (spinal angiography, ophthalmological exam, evoked potentials, etc.)

Subsequent Management (>48 Hours)

- Continue corticosteroids and assess response to therapy
- Early involvement of rehabilitation specialists
- Begin planning for bowel/bladder management needs
- Assess the potential role for more aggressive immunomodulatory therapy
- Optimize strategies for symptom management and prevention of complications

Early Prognostic Features in TM

- Antecedent illnesses/events (etiology)
- Demographics (age, gender, etc.)
- Symptoms present at onset
- Type/rate of onset
- Level of spinal cord deficit
- MRI findings
- CSF data
- Acute treatments

Clinical and Outcome Data in 178 Patients from Four Series of Acute Transverse Myelopathy

Data and Outcome	Paine and Byers [15]	Altrocchi [2]	Lipton and Teasdall [11]	Ropper and Poskanzer [this series]	Total
Total patients	25	67	34	52	178
Preceding febrile illness	15	20	12	18	65
Initial symptoms					
Paresthesias	1	17	9	24	51
Back pain	6	17	12	18	53
Leg weakness	9	17	11	7	44
Sphincter disturbance	3	2	4	3	12
Time to maximal deficit					
<1 day	...	30	15	13	58
1 to 10 days	...	23	17	30	70
>10 days	...	16	2	9	27
Multiple sclerosis	...	4	1	7	12
Outcome					
Good	15	22	9	16	62
Fair	6	22	9	20	57
Poor	...	16	2	12	30

Clinical Characteristics of Patients With Acute TM Related to Eventual Outcome

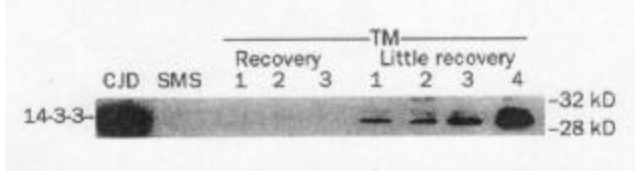
	Poor (n = 9)	Fair (n = 9)	Good (n = 9)
Age at onset (years)	median: 37 (range 15–74) mean: 40	35 (range 14–54) 33	22 (range 16–46) 30
Time from onset to maximum (days)	mean: 4.6 (range 0.3–17)	7.3 (range 0.8–19)	7.7 (range 1–7)
Duration of maximum phase (days)	mean: 10.1 (range 3.5–29) *	3.9 (range 2–9)	7.7 (range 1–7)
No. of patients with:			
Preceding viral-like infection	4	3	2
Back-pain	8 **	4	3
Paresthesiae	3	5	6
Spinal shock	6 ***	1	1

Acute Features That May Herald a Poor Long-Term Prognosis in TM

- Catastrophic course ("spinal shock")
- Back pain at onset

- Irreversible injury to axons in the spinal cord
  - -hypointense lesions on T1-weighted MRI
  - -neuronal injury via MRI spectroscopy
  - *-leakage of neuronal proteins into the CSF?*

14-3-3: A Neuronal Protein That When Detected in the CSF of Patients With Acute TM (<2 weeks of onset) Predicts a Poor Long-term Outcome



Conclusions

- An accurate diagnosis of TM requires a careful history, examination, and the use of ancillary studies
- High-dose IV steroids can sometimes hasten a clinical recovery
- Aggressive management of acute symptoms and efforts to avoid complications should be pursued
- Clinical, radiographic, and CSF-based criteria can help clarify the long-term prognosis