Chronology of edx & radiculopathy - PROGNOSIS

Cervical; Lumbosacral;Thoracic

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HX

- Where?
- Buttocks is NOT back or hip!
- Pain is NEVER radiating (a continuous line from beginning to end)
- IT IS *REFERRED To distal sites*

When pain begins

- This is onset of a radiculopathy
- Pain –
  - Is myotomal) referred deep = posterior shoulder; elbow; buttock; thigh & leg
  - Is scleratomal)
  - ***Not root specific***
  - *Not dermatomal* ***! Superficial tingling and numbness are dermatomal symptoms***

history

- When pain begins
  - Nerve root is inflamed
    - Conduction is slowed and ephaptically transferred to neighboring axons: f waves; H reflex; recruitment frequency

NEEDLE EMG

- If only minimal or suspected weakness
  - Reduced recruitment frequency - i.e. Ist MU will be firing faster at moment of 2d MU activating!

  (normal is 10-12 hz)

- If substantial weakness
  - Reduced recruitment can be recognized
  - (NB note rate of firing – reduced # can

"*early polyphasic* motor unit"

- At site of compromised nerve root, ephaptic conduction CAN occur among touching axons resulting in the needle exam recording grouped MU discharges as an – "early polyphasic"
- Colachis, Johnson et al (J. EMG.Neurophysio.1992

Earliest EDX abnormality on Conduction studies

- In S-1 "H reflex" latency will be increased on affected side – ***when pain begins***
  - Original study (Braddom & Johnson) 1 SD = 1.2 ms
  - Subsequent studies (Johnson et al) suggest difference of ***.5 ms side-to-side*** is a red flag. 1(one) ms is standard accepted significance for side to side difference.

F waves

- If early in course of radiculopathy there is ephaptic interaxonal activation can occur *at inflamed nerve site* and F waves could appear as dispersed more than normal OR the fastest will be slower! (Stalberg et al)
- Number Recorded: 8 – 10 (or even 20)

PROGNOSIS

- After 10 days – 2 weeks stimulate nerve to weak muscle and compare CMAP ***AMPLITUDE*** with contra-lateral (normal) muscle
- NB. ***Difference is >10 percent with precise location of recording electodes***.

Upper limb muscles for prognosis

- C-5 mid deltoid
- C-6 infra spinatus
- C-7 triceps (long head)
- C-8 pronator quadratus

Lower limb muscles for prognosis

- L-4 V lat or ant tib
- L-5 extensor dig longus
- S-1 medial gastroc-soleus
- S-2 abd dig V pedis

prognosis

- If CMAP(after 10-14 days) is w/in 20 per cent of normal side ***good prognosis***
- *Colachis, Johnson E Et al Arch PM&R1993*
- ***If <50 percent - (bad - relatively speaking -prognosis for weakness)***
- *BUT collateral innervation can compensate for a substantial degree of weakness*

Step 4 – needle exam

- Number of MU's activated on maximal effort is NOT definitive for prognosis
  - blocking can occur at site of compromise
  - number of fibrillation potentials is NOT definitive for prognosis.
  - ***Stimulate for CMAP amplitude to get best notion of prognosis***

SUMMARY - CHRONOLGY

- WHEN PAIN STARTS
  - H REFLEX IN S-1
  - "EARLY POLYPHASIC"
  - F WAVE DISPERSION
  - RECRUITMENT FREQUENCY at early weakness
  - Substantial weakness – Reduced activation frequency
- 10 – 14 days *CMAP amplitude* = prognosis
  - Positive waves in paraspinal and proximal limb
  - muscles
- 21 + days – Fibrillations in all affected muscles
- 4-5 weeks - earliest MU polyphasic as a sign of axonal collateral innervation
- Large MU appear at 4-5 months after significant radiculopathy

Bottom line

Effect of pain/weakness on function!

edx? No need to WAIT!

- ***EDX FOR RADICLOPATHY***
  - –NO NEED TO WAIT!
  - –Begin at onset of Pain
  - – Always check for prognosis (CMAP ***after*** 10-14 days)
  - – NB. If no true weakness – no need for Operation
  - – If true weakness present – WHY operate?

Indications for EDX

- *Every clinically suspected radiculopathy – cervical, thoracic and Lumbosacral!*

Must have EDX before starting RX (or management in the broadest sense)!!!!!!!!

This would be evidence based!

N.B. Imaging studies DO NOT substitute for EDX they are complementary

PROGNOSIS

- *10 days – 2 weeks after INSULT*
- COMPARE C-MAP WITH CONTRALATERAL normal w/in 10 %
- *(Assume precise electrode placement)*