



QUANTITATIVE SENSORY TESTING (QST) AND INTRA-EPIDERMAL NERVE FIBRE ASSESSMENT IN NEUROPATHIC PAIN – a pathophysiological study

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Introduction

It is recent years there has been a broad consensus of opinion that a pathophysiological approach to neuropathic pain should guide patient management but animal and healthy human data can not be directly extrapolated to the clinical situation.

We are presenting preliminary data from an ongoing clinical study which attempts to examine the relationships between symptoms, signs, QST findings and intra-epidermal nerve fibre density in a large series of neuropathic pain patients.

Methods

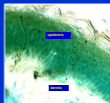
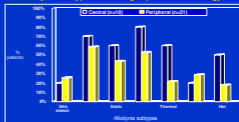
symptoms were examined using:

- a standard history sheet and the NeuroPathic Pain Scale¹
- Hospital Anxiety and Depression Scale (HADS),²
- Shorti Form (SF-36) scale.³

signs were measured:

- area of pain,
- areas(s) of hypoesthesia and allodynia to warm, cold, punctate & brush stimuli (see figure 1 for equipment used),
- sensory detection thresholds to vibratory, thermal & punctate stimuli with contralateral mirror image area used as control,
- suprathreshold VAS responses to repeated brush-punctate and painful hot stimuli in areas with abnormal sensation,
- 3mm skin punch biopsies taken from hypoesthetic & allodynic areas for intra-epidermal nerve fibre density estimation.⁴

Allodynia subtypes according to presumed aetiology



Skin section immunostained with PGP 9.5 and counterstained with methylene blue. This unmyelinated nerve fibres (yellow arrow) and dermal plexus (red arrow) are seen.



main equipment used in study

Group diagnoses

Diagnosis	Frequency	%
Central post stroke pain	6	13.3
Alcohol dis injury	4	8.0
metabolic neuropathies (including diabetes)	5	8.2
post herpetic neuralgia	10	16.4
burning feet syndrome	10	16.4
post traumatic neuropathic pain (including CRPS)	10	16.4
Idiopathic neuropathy	5	16.2
others	15	24.6

Results

64 patients (33 : 38 %)

mean age 59.4 years (range 25 – 87 years)

66 patients had spontaneous pain with a mean VAS = 65%

26 patients also had a 2nd spontaneous pain with mean VAS =48%

1 patient had evoked pain only

Note: thermal allodynia defined objectively as heat pain threshold reduced by > 2°C &/or reduction in cold pain threshold by > 2°C in painful area of sensory abnormality

Temporal summation

Defined as a significant increase in baseline VAS with repetitive stimulation (any increase if baseline VAS = 70% or increase of > 30% if baseline VAS <70%)

Stimulus	Peripheral (n=11) Number (%)	Central (n=10) Number (%)	Total (n=21) Number (%)
Punctate Stimulus	30 (33%)	7 (70%)	27 (64%)
Brush stimulus	19 (27%)	6 (60%)	25 (61%)

Conclusions

This ongoing study presents preliminary descriptive data from a neuropathic pain population and shows that interesting findings can arise from single subjects which could optimize future management. There is a suggestion that thermal allodynia and temporal summation to punctate and brush stimuli are more prevalent in patients with central neuropathic pain. We intend to perform a rigorous statistical analysis of the data after a further 60 patients have been tested.

Our methods could identify various subgroups of patients depending on their specific combination of symptoms, signs, QST findings and intra-epidermal nerve fibre density. Future drug trials and investigations could then be directed at patient groups with presumed shared pathophysiological mechanisms.

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