

DIABETIC NEUROPATHY: HISTOPATHOLOGY

- Axonal degeneration of both myelinated and unmyelinated fibres .
Early: axon shrinkage
Later: axonal fragmentation;
regeneration
- Thickening of Schwann cell basal lamina
- Patchy, segmental demyelination
- Thickening of basement membrane and micro thrombi in intraneural capillaries

CLASSIFICATION OF DIABETIC NEUROPATHY

SOMATIC

*Polyneuropathy

Symmetrical, mainly sensory and distal

Asymmetrical, mainly motor and proximal (including amyotrophic)

* Mononeuropathy (including mononeuritis multiplex)

VISCERAL (AUTONOMIC)

- * **Cardiovascular**
- * **Gastrointestinal**
- * **Genitourinary**
- * **Sudomotor**
- * **Papillary**
- * **Vasomotor**

CLINICAL FEATURES

- * Symmetrical sensory polyneuropathy
- * Asymmetrical motor diabetic neuropathy
- * Mononeuropathy
- * Autonomic neuropathy

CLINICAL FEATURES OF AUTONOMIC NEUROPATHY

Cardiovascular

- * Postural hypotension
- * Resting tachycardia
- * Fixed heart rate

Gastrointestinal

- * Dysphagia, due to esophageal
- * Abdominal fullness, nausea and vomiting, unstable glycaemia, due to delayed gastric emptying ('gastro paresis ')
- * Nocturnal diarrhea \pm faecal incontinence
- * Constipation, due to colonic atony

Genitourinary

- * Difficulty in micturition, urinary incontinence, recurrent infection, due to tonic bladder .
- * Erectile dysfunction and retrograde ejaculation

Sudomotor

- * Gustatory sweating
- * Nocturnal sweats without hypoglycemia
- * Anhidrosis; fissures in the feet

Vasomotor

- * Feet feel cold, due to loss of skin vasomotor responses
- * Dependent oedema, due to loss of vasomotor tone and increased vascular permeability
- * Bullous formation

Pupillary

- * Decreased pupil size
- * Resistance to mydriatics
- * Delayed or reflexes to light

TESTS OF CARDIOVASCULAR AUTONOMIC FUNCTION

Simple cardiovascular reflex tests

- * Heart rate variation during deep breathing
- * Heart rate response to standing
- * Heart rate changes during the Valsalva manoeuvre
- * Blood pressure response to standing
- * Blood pressure response to sustained hand grip

Other tests

- * Baroreflex sensitivity using power spectral analysis of heart rate
- * Time- domain analysis of heart rate and blood pressure variations
- * MIBG (meta- iodobenzylguanidine) scan of the heart

MANAGEMENT OPTIONS FOR PERIPHERAL SENSORIMOTOR AND AUTONOMIC NEUROPATHIES

CONDITION

Pain and paraesthesiae
peripheral somatic
neuropathies

Postural hypotension

MANAGEMENT

Intensive insulin therapy (strict glycaemic control)
Tricyclic antidepressants (amitriptyline, imipramine)
Anticonvulsants (gabapentin, carbamazepine, phenytoin, pregabalin)
Substance P depletor capsaicin-topical
Opiates (tramadol, oxycodone)
Membrane stabilisers (mexiletine, intravenous lidocaine)
Antioxidant (α -lipoic acid)

Gastroparesis

Diarrhoea

Constipation

Atonic bladder

Excessive sweating

Erectile dysfunction (impotence)