North Coast Vascular

"Keep It Circulating" – July 2017

Focus on the Diabetic Foot by Dr Deepak Williams

"One small step for man, one giant leap for mankind" by Neil Armstrong

The prevalence of diabetes mellitus in 2014/15 was 1.2 million, which is 6% of the population over the age of 18. Diabetes is projected to reach 3 million Australians over the age of 25 by 2025. Amputation is a largely preventable complication of diabetes and more than 85% of major amputations in patients with diabetes are preceded by foot ulceration. The majority of patients with foot lesions have peripheral arterial disease (PAD) and those who do not have (PAD) have microvascular disease.

Lesions and ulcerations of the foot carry high morbidity and mortality and represent the most common cause of hospitalization in patients with diabetes. Lifetime risk of ulceration has been between 15 and 25 with annual incidence of 2%. More than 4,400 diabetic related amputations are performed in Australian hospitals every year. That is 12 everyday, costing $875 million per year; 85% of diabetic amputations are preventable if problems are detected early and managed appropriately.

Neuropathy plays a crucial role in the development of foot ulceration. Sensory neuropathy is usually "a glove and stocking" distribution from the extremities. Proximity Vibration Perception Test (VPT) is the gold standard for detection of sensory neuropathy. Some patients may develop neuropathic pain, which is classically "burning in nature" and may be exacerbated on ambulation. Most neuropathy results in weakness of intrinsic muscles of the foot, this results in clawing of toes and distal shift of protective feet pads overlying the head of the metatarsals. Consequently, the metatarsal head is a common location for ulcerations. Autonomic neuropathy leads to warm dry feet. The cracks and fissures which develop from dry skin are portals for micro-organisms entry and infection.

PAD is more common in patients with diabetes compared with the general population and also much more aggressive. The lesions are multilayered and particularly severe in the tibial arteries.

Microcirculation dysfunction manifests in patients with diabetes by neuropathy, retinopathy and nephropathy. These are classically associated with endo-tibial dysfunction, leading to a cycle of excoriation, capillary damage and nerve damage which contribute to tissue damage. Arterial wall calcification is common (Mönckeberg Medial Sclerosis). Poor glucose control also leads to increased blood viscosity with increased levels of fibrinogene and haptoglobin. Collateral formation and angiogenesis is impaired and may lead to poor wound healing.

Treatment is multi-disciplinary with emphasis on early detection. Treatments may include: revascularization, optimal foot wear to avoid pressure areas, wound care and well controlled diabetes.

Charcot's Neuroarthropathy is a devastating foot complication of diabetes reported in most sensory neuropathies, but now diabetes is the most common cause and can occur in up to 10% of patients with neuropathy. In the early stages the foot is warm, swollen (usually 2 degrees larger compared with the unaffected foot) and erythematous. If not treated promptly leads to collapse of mid foot and "rocker bottom foot". The mainstay of treatment is bedrest and immobisation usually in a total non-contact cast.

Key Points of Diabetic Foot Management are:

- Management of the diabetic foot is challenging and requires multi-disciplinary approach.
- Identification of high risk patients must be both comprehensive and regular; and patient education must be part of the process.
- Once ulceration has developed, aggressive management can achieve excellent results with significant reduction of both amputation and reulceration rates.

What's New at NCV

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Dr Deepak will be educating UCRH Students on "The Cold Foot" in August

NCV provides **FREE Education** in our rooms to GPs and Practice Nurses (CPD are awarded)

Larger **Telehealth** presence for Nursing Home Residents in the Northern Rivers

Change of Location for Clinics in **Ballina** (as of 27 July 2017) and **Maclean** (as of 3 August 2017). Our patients will now be able to be seen and have their ultrasound scans under ONE roof

GP and Practice Nurse Education evening in Ballina in July (Thursday, 27th July 2017). To register your interest please contact Margie on 6621 2200

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PERIPHERAL NEUROPATHY

By Dr Robert Lodge

"Painful feet" is a common symptom leading to Vascular Surgical referral. But, of course, peripheral arterial disease is not the only cause and a common differential diagnosis for painful feet, or altered sensation, is peripheral neuropathy (PN).

The term PN encompasses sensory neuropathy, mixed motor-sensory neuropathy, pure motor neuropathy and autonomic neuropathy. Symptoms depend on which nerve fibres are involved–sensory, motor or autonomic-and, therefore, can include burning, paraesthesia, ("pins and needles"), tingling, numbness, poor balance, muscle weakness and altered sensation to touch (allodynia). Neuropathic pain is due to altered sensation from damaged sensory fibres. Long-term sensory neuropathy can lead to skin and hair abnormalities and even joint and bone damage.

There are several classifications of PN but the simplest is dividing into mononeuropathy or polyneuropathy; acute or chronic; and, axonal or demyelinating. Where peripheral neuropathy is the cause of painful feet, 90% of cases are due to chronic, axonal polyneuropathy.

When considering the peripheral nervous system, it is important to recall basic neurophysiology- lower motor neurones and the sensory fibres which transmit vibration, proprioception and light touch are all myelinated, whereas small, unmyelinated fibres (C fibres) transmit pain and temperature.

Common aetiologies of PN are diabetes, excessive alcohol, vitamin deficiency (B12, B1, B6), autoimmune including Guillain-Barre (acute) and CIDP (chronic), uraemia, medications (nitrofurantoin, chemotherapy, antiretroviral), peripheral arterial disease, toxins (lead, mercury, arsenic) and genetic (Charcot-Marie-Tooth). Leprosy is a common cause worldwide.

Diagnosis of peripheral neuropathy requires:-

1. appropriate history with special attention to comorbid conditions
2. careful neurological examination which entails testing of power, peripheral reflexes (particularly ankle jerks) and, importantly, ALL sensory modalities. Normal exam and even normal NCS may suggest small C fibre neuropathy.
3. targeted blood investigations which will include some, or all, of the following-FBE, E/LFT's, HbA1c, TFT's, vitamins B12, B1, B6 and RBC folate, Autoab's incl Anti-Gm1, serum protein studies and heavy metals.
4. definitive evidence of PN is obtained from NCS (nerve conduction studies), which can differentiate axonal (90%) from demyelinating (10%) neuropathie
5. genetic testing is performed in suspected genetic peripheral neuropathy (e.g. CMT)
6. CSF examination is occasionally necessary (e.g. CIDP) rarely, peripheral nerve biopsy (usually sural) or skin biopsy (small fibre neuropathy) are required to confirm diagnosis.
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Principles of management are: -

1. manage/correct underlying aetiology
2. avoid exacerbating factors-excessive alcohol, smoking, malnutrition, and peripheral arterial disease
3. careful foot care with close involvement with podiatrists
4. immunosuppressive therapy (corticosteroids, azathioprine, IVIG, plasmaphoresis) for autoimmune and inflammatory neuropathies
5. treatment of neuropathic pain - NSAID's, anticonvulsants (pregabalin, gabapentin, carbamazepine), antidepressants (amitriptyline, duloxetine), topical therapies (capsaicin cream e.g. Zostrix), analgesic agents (e.g. tapentadol) but best to avoid opiates, if possible, to avoid long term addiction issues

Whilst prognosis depends on underlying etiology, it is however rare for axonal peripheral neuropathy to fully regress.

WHO SHOULD BE REFERRED TO A VASCULAR SURGEON *by Christine Kemp*

Vascular Surgeons **PREFER** to see patients early in the disease process. Many patients hopefully will not progress to surgery. You can refer any Patients with:

- Unexplained leg pain
- Abnormal Vascular studies
- Aneurysms
- Carotid Atherosclerosis
- Abnormal Peripheral Pulses
- All extremity wounds
- Hemispheric Neurological Events

The risks of a missed vascular diagnosis are so high that any patients with a suspected vascular problem should be referred for prompt consultation

Vascular Tips -

Have a walking program for Peripheral Arterial Disease

Research indicates that most people, after 6 weeks of having a walking program have a 100% - 300% improvement in the distance they can walk before having intermittent claudication.

- Begin with a slow warm up walk for 5 minutes
- Increase pace; if pain begins try to walk at least 25m more, stop when the pain becomes severe. Record the number of continuous minutes walked
- Stop, remain standing and rest, until the pain lessens
- Resume walking
- Continue this pattern until 30 minutes of walking time has been added
- Try to begin with a walking speed of 3kms per hour

Progressing to 60 minutes

- Walk every day
- Week 2: Add 5 – 10 minutes over the week; total 40 minutes
- Week3: Add 5 – 10 minutes; total 50 minutes
- Week 4: Add 5-10 minutes; total 60 minutes
- Continue with 60 minutes for 5 – 7 days each week

Once 60 minutes of walking time has been reached increase walking pace

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