Diabetic Foot Syndrome: diagnostics, treatment and prevention

Pavlína Pit'hová

Diabetic foot syndrome

- affections located below the ankle
- > 25% of diabetic patients
- ***serious sequelae -*** gangrena (20x more)
- necessity of ***amputation*** (30x more)

Etiology:

- diabetic ***neuropathy***
- diabetic ***angiopathy*** (tissue ischemia)
- ***limited joint mobility***
- ***infection*** often limits the ulcer healing

Ulceration

- Focal loss of **skin** barriere, sometimes with damage of the **subcutaneous tissue**
- Sometimes deeper damage – bones, tendons, joints..
- Normally the healing is fast
- Disturbances in **perfusion**, the **infections** or **persistent traumatism** changes the situation – the non-healing ulcer occurs

What is different in diabetic patients?

- ***Changes in skin metabolism*** (↑glu)
- ***Decrease in sweat and sebaceous glands function*** (changes in hydration of stratum corneum and impairment of sebaceous layer)
- ***Glycosylation of connective tissues*** – rigidity
- ***Decrease of cellular immunity*** (↓ migration, fagocytosis)
- ***Changes in biomechanics of the foot***
- ***Atrophy of lipoid pillows in metatarsal head area***

Etiopathogenesis

- **peripheral neuropathy**
  - ↓of touch, vibrations and termic sensitivity
  - Disturbances in biomechanics of the gait
  - Changes in microciculation - „pseudohypoxia“
  - Changes in function of sweat glands
- **angiopathy** – in 50%; significantly worses healing
- **infection** – worses healing
- **limited joint mobility**

Reasons for ulcerations

- ***unfitting shoes*** (80%)
- burns
- small injuries (walking barefoot, wearing foreign bodies in shoes, come down socks)
- mycosis, infections

Clinical assessment – identification of risk patients…the severity of risk or what caused the ulceration

- **Inspection**
- **Palpation**
- **Neurological assessment**
- **Blood flow screening**
- **Examination of the patient´s shoes**
- **General examination** – level of metabolic control, nutrition, lipids….

3/ Neurological examination

- history of neuropathic pain
- history of decreased sensations/insensitive feet
- tuning fork/neurothesiometr
- monofilaments
- hot/cold water

4/ basic angiological examination:

- Pulses
- Ankle and toe pressure/indexes
- Fotopletysmography – wave form analysis

5/ checking the patient´s shoes

6/ plantoscopy, tread mill – claudication interval/biomechanics of gait

7/ angiological imaging

Duplex ultrasound

Diabetic ulceration

- Neuropatic foot
- Ischemic foot

Neuroischemic foot

Neuropathic foot - treatment

- ***Off-loading***
- ***Metabolic compensation***, insulin application
- ***Antibacterial treatment***
- ***Local therapy*** – debridement, wound bed preparation
- ***Choice of ulcer dressing***

Treatment of ischemic/neuroischemic ulcers

- To improve the blood flow – **revascularization** – PTA or by-pass – possibility to save the limb up to 90% in the case of aggressive treatment
- ***Stop smoking***, ***treat hypertension and dyslipidemia***
- ***Metabolic compensation***
- Local therapy, separate the toes – gauze, „toe-socks“
- Very patient and saveful local treatment
- Support of microcirculation – hyperbaric oxygen therapy, prostaglandin infusions

Patients´education: basic knowledge is important for future…

- Teach the patient to check the feet and nails daily and how to treat small injuries
- Teach the patient to be careful and smart in their footcare
- Teach the patient to know about the „dangerous signs“
  - changes in colour
  - edema
  - pain
  - injuries

Education: prevention of new ulceration

- High risk during fitness activities!! (Up-to-date treatment of diabetic patients– physical trainig and diet….)
- Essential is to recommend activities without loading the feet (spinning, swimming, rowing…) or in appropriate and fitting shoes only