Aspects of tropical ulcerating diseases
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Chapter 8

Summary & conclusion
Summary

A well known problem doctors are aware of are non- or very slowly healing ulcers in patients in tropical areas or travellers in or from such areas. No scientific studies have been published on this subject, but it is an observation by clinicians working in the tropics or at outpatient clinics for tropical diseases in the western world. Various aspects related to healing of skin ulcers in patients in tropical areas or in travellers in and from such areas are described in this thesis.

An introduction of the thesis is presented in Chapter one. Epidemiology, clinical aspects, diagnostic procedures and treatment of the most common ulcers which are encountered as an imported disease in outpatient clinic in the western world are presented.

It is likely that the incidence of imported ulcers will rise because travel to and from tropical countries is becoming more frequent. Ulcers originating from the tropics show great variations. Besides clinical examination, histopathological, microbiological or molecular biological investigations may be necessary to reach a final diagnosis. A guideline for clinicians dealing with “tropical ulcers” is also described in this Chapter.

In Chapter two, a study in which changes in the microcirculation in travellers to the tropics were investigated is described. We hypothesized that in travellers to tropical areas, a change from temperate to hot humid climate may result in a subsequent change in the microcirculation of the dermal plexus. An adaptation to higher temperatures could lead to distension of dermal capillaries, which may cause oedema. It is well known that oedema may delay wound healing.

In this study we determined the capillary filtration rate (CFR) as a measure for micro-oedema mainly in Caucasians who had just arrived in Suriname and South-America from The Netherlands, and compared this with Caucasian volunteers who had stayed in the tropics for at least 2 months, and to healthy native volunteers. The purpose of this study was to investigate whether CFR was increased in travellers who had recently arrived in the tropics from a temperate climate and thereby support the hypothesis that (micro)-oedema impairs wound healing. Mean CFR was significantly higher in travellers who had just arrived in Suriname compared with those who had stayed there for a longer period. Our results indicated that the tendency to develop (sub)clinical oedema may play a role in delayed wound healing. Therefore, compression therapy is recommended for non-healing wounds in travellers from the tropics to temperate climates.

A study which was conducted to evaluate colonisation of wounds with micro-organisms and the anti-microbial resistance in Suriname, Indonesia and Zimbabwe is described in Chapter three. This study was undertaken to obtain further insight into the bacterial colonisation and the resistance of the bacteria present in wounds.
in the tropics. Knowledge of the bacterial colonisation of wounds in a given area and their anti-microbial sensitivity is useful not only for epidemiological reasons, but also for determining the most effective anti-microbial treatment. Ninety-nine swabs were taken from the surface of chronic wounds. They were stored and transported to The Netherlands for further processing.

The results showed that there were no significant differences in bacterial colonisation of the chronic wounds in the different locations. Moreover, it seemed that there was also no difference in the bacterial colonisation of chronic wounds in comparison to those encountered in the western world.

The most striking finding overall was the difference in the prevalence of anti-microbial resistance between the three tropical countries. Resistance of staphylococci and streptococci to tetracycline was high in all three countries. Low resistance against other anti-microbial agents was found in the isolates from Suriname, whereas in the Indonesian samples the prevalence of methicillin resistant *S. aureus* (MRSA) was substantial, as well as the anti-microbial resistance of the gram-negative bacteria both to older agents like gentamicin and tobramycin and to newer anti-microbial agents like ciprofloxacin and the third generation cephalosporins. The observed differences may be explained on the basis of either prescription behaviour of medical doctors or the free over the counter availability of medication in the three countries.

A study in which the prevalence and the aetiology of chronic skin ulcers was assessed in patients at the Queen Elizabeth Central Hospital (QECH) in Blantyre, Malawi is presented in Chapter four. Although chronic ulcers are an important cause of morbidity in tropical countries, in contrast to developed countries, little is known on the prevalence and the aetiology of skin ulcers. Data on the history and physical examination were collected; on indication skin biopsies were taken for histological examination and bacterial cultures were set-up when infection was clinically suspected.

In the 10 week study period, 45 of the 5988 patients who were admitted at the departments had chronic skin ulcers. The most important causes of ulcers was bacterial infection, followed by malignancy and trauma. In contrast to the western world, venous and arterial ulcers were encountered in only few cases. A surprisingly high number of malignancies was found. Squamous cell carcinoma in long-standing chronic ulcers in Africans is well known. If wound healing is delayed, this results in chronic inflammation, which can give rise to the phenomenon of “scar cancers”. Most patients did not report a long duration of their ulcers. One may speculate that these malignant ulcers existed for a much longer period than reported by the patient. However, it is known that HIV infection is endemic in the studied group of patients. HIV infection may contribute to impaired wound healing. We speculate that this may explain the high number of malignancies encountered in this study.
A clinical study in which the tolerability and the efficacy of a hydrocolloid dressing for treating venous leg ulcers under humid and hot conditions in Surinam was investigated is described in Chapter five. Hydrocolloid dressings are widely used for treating wounds. However, little is known on their tolerability and efficacy under tropical conditions. Besides the financial factors, alleged increase in the frequency of wound infection may be an important reason that these semi-occlusive dressings are not used regularly under hot and humid conditions.

Seventeen patients with venous leg ulcers were enrolled into the study for a period of 6 weeks. Hydrocolloid dressing were changed twice a week, short stretch compressive bandages were applied. The results showed that all ulcers showed a good healing tendency. A clear improvement in the percentage of granulation tissue and the circumference together with reduced exudates was observed. The dressing was generally well accepted. There were no differences in the rate of bacterial infection or colonisation of ulcers compared with those in studies in the temperate regions were noted.

The import of cutaneous leishmaniasis (CL) in the Netherlands from 1990 to 2000 is dealt with in Chapter six. Leishmaniases are visceral, cutaneous and mucocutaneous diseases caused by parasites belonging to the genus *Leishmania*. Although cutaneous CL is the mildest clinical form, it may cause considerable morbidity, and after healing often leaves disfiguring scars. All varieties are transmitted to humans by sand-flies. The disease occurs throughout the tropical and sub-tropical regions of the world with an estimated 1.5 to 2 million cases per year of which the majority is CL. The clinical picture is diverse and may vary from one or more papules to ulcers with or without a scab. Lymphangitis may be present. Mucocutaneous leishmaniasis, although uncommon, may develop as a complication of new-world CL. Leishmaniases is considered to be an imported skin disease with a rising incidence in the last 10 years in the Netherlands. A Dutch study reported 49 patients with CL, in the period 1979-1989; Mediterranean countries were the most important source of infection.

We were interested to investigate whether a change in this pattern had occurred in the subsequent years. The sensitivity of our diagnostic procedures, the mode of treatments and the results of treatments were examined. The incidence, the clinical picture, the treatment modalities and the response of patients diagnosed with CL from January 1990 to January 2000 at our hospital were retrospectively investigated. From 1990 to 2000, CL was diagnosed in 78 patients. The disease had most frequently been acquired in Belize, Suriname, French Guyana and Bolivia. The most sensitive diagnostic tool was PCR., Antimony (Sb) is still the drug of choice in the Americas. If infection with *L. mexicana* is suspected itraconazol is our drug of choice. Pentamidine seems to be the drug of choice for CL acquired in the Guyanas.
It is recommended to culture and characterise the parasite if facilities are available so that treatment can be directed at the particular species involved.

A patient who developed a Buruli ulcer after travelling in the Shan Dong Province in the People’s Republic of China is described in Chapter seven. It is the first reported case of Buruli ulcer in the People’s Republic of China and proves that *M. ulcerans* infection is also present in the temperate climate zone in the Northern Hemisphere.

**Concluding remarks**

Changes in the microcirculation in travellers to the tropics may lead to oedema, especially in the lower legs. Oedema is treated by compression therapy. A lot of experience on compression therapy is available in the western world. However, no studies on compression therapy under tropical conditions have yet been published. Compressive bandages or Compression stockings are often poorly tolerated in the hot and humid conditions in the tropics. Studies in this field under tropical conditions are warranted and would be useful.

Traumatic skin ulcers which are secondarily infected are mainly encountered in travellers from tropical areas. These ulcers are often colonised by *S. aureus* or streptococci and more difficult to manage than ulcers encountered in the western world. It seems that these bacteria are not more prevalent in the tropics, at least not in chronic wounds according to the results of our studies. It would be interesting to investigate whether these bacteria are more virulent in the tropics. Therefore, it would be interesting to undertake studies on the virulence of these bacteria.

There are only few reported studies on the use and effectiveness of wound dressings in the tropics. Despite the frequent use of antibiotic-containing ointments in many tropical countries with increased antibiotic resistant bacteria, more research into cheap, easy to apply wound dressings for the tropics is warranted.

Cutaneous leishmaniasis should always be ruled out in travellers with wounds from endemic areas. Specifying the parasite is important for choosing the optimum treatment. However, the reported indications for treatment and the currently recommended treatment regimes vary considerably. Some treatments are well established. However, there are only a few double-blind clinical trials in which different treatment modalities were investigated. Generally, sufficient numbers of patients for conducting clinical trials are only available in the endemic areas. Therefore, it is imperative that we support investigators in the endemic areas in pursuing clinical trials.