How to run a an effective and efficient dermato-oncology unit.

Short title: How to run a dermato-oncology unit

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Summary

The worldwide incidence of skin cancer (especially non-melanoma skin cancer) has risen dramatically over the last decades. Skin cancer, including pre-malignancy is becoming a chronic disease. Adjustments in skin cancer health care need to be made. A disease management system for skin cancer is mandatory in order to avoid waiting lists and insure adequate treatment quality with ever growing numbers of patients requiring (surgical) treatment. At the Catharina Hospital Eindhoven adjustments are being made on several levels of the dermato-oncology unit in collaboration with Eindhoven University of Technology. The model combines technological improvements, with training of health care workers, training General Practioners and prevention of skin cancer. In this article we will discuss our ideas and clinical experiences on managing a dermato-oncology unit.

Zusammenfassung

Introduction

The worldwide incidence of skin cancer (especially non-melanoma skin cancer) has risen dramatically over the last decades.[1,2]

Estimates show that one in five persons will be diagnosed with skin cancer in their life time.[1] This is probably an underestimate because adequate registration of these cancers is often lacking in many countries.[2] Traditionally, the incidence is highest in the elderly (> 65 years), 438 per 100,000 person-years.[3] There is a world-wide rise in skin cancer incidence of at least 5% annually.[3] This increase will continue for at least two decades, and is caused by a growing aging population as well as an increase of UV exposure (solar and artificial).[3]

A second patient group consists of organ transplant patients who develop multiple lesions. Although rates differ across various countries, the number of patients receiving organ transplants is increasing. In the Netherlands 1,100 persons had organ transplants in 2007, which is an increase of 28% compared to 2006.[4] Since the improvement of graft survival has resulted in increased survival for transplant patients, the number of survivors has increased accordingly. However, this phenomenon is paired with a longer duration of immune suppressive medication resulting in more skin malignancies.[5,6] Nearly 50% of all renal transplant patients develop skin cancers within 20 years after transplantation.[6]

The younger adult population (15-34 years) is a third large patient group. In this group, it is predicted that skin cancer incidence will double from 322 incident cases in 2000 to 676 incident cases in 2015.[3]

With a population that is aging and a skin cancer incidence that is on the rise in the younger population, a growing amount of patients will be confronted with multiple new tumours for the rest of their lives. In addition, many of these patients have skin

pre-malignancies as well.[7,8,9,10] Skin cancer and pre-malignancy is becoming a chronic disease with a disease burden comparable to other chronic diseases.

The increased prevalence has resulted in many dermatologists needing to allocate more of their time to these problems. An evaluation of the diagnosis-treatment codes of a large outpatient dermatology clinic at the Catharina-Hospital Eindhoven in the Netherlands shows that over 50% of dermatologists' time is spent on skin cancer and pre-malignant skin lesions. This is only the tip of the iceberg. If no changes are planned for the health care system, this will result in dermatologists' work being limited to skin malignancies and pre-malignancies, resulting in less attention paid to other dermatology patients. Consequently, adjustments in skin cancer health care need to be made. A disease management system for skin cancer is mandatory in order to avoid waiting lists and ensure adequate treatment quality with ever growing numbers of patients requiring (surgical) treatment.

In the literature, few articles are available about the management of a dermatology practice. The latest articles date back to 2000, discussing general adjustments for dermatology clinics to achieve the best possible business outcome.[11,12,13] No literature at all is available about running a dermato-oncology unit, i.e. how to deal with an increasing amount of skin cancer patients while maintaining quality of care. Few articles describe specialty clinics for the dermatologic care of solid-organ transplant patients.[14,15] They emphasize the importance of an organized and firmly established clinic model to allow proactive and ongoing care for these patients. Close communication with the team of transplant physicians, education of other health care providers, an effective scheduling mechanism and patient education are all described as key points to provide the best care.

At the Catharina Hospital Eindhoven, adjustments are being made on several levels of the dermato-oncology unit. In this so called “disease management system for skin cancer”, we are working closely together with the Eindhoven University of Technology. In the past 5 years it has shown to be possible to accommodate an increase of 20% in skin cancer patients at the Catharina Hospital. Workflow technology will help in further reorganizing this dermato-oncology unit so that it will be capable of facilitating an annual increase of at least 5% skin cancer patients. We will discuss our ideas and clinical experiences with respect to developing the disease management system for skin cancer.

Prevention

First of all, prevention is one of the most important strategies to influence the rapidly increasing incidence of skin cancer. Prevention campaigns should increase attention to young children and their parents, with a focus on UV protection throughout life. Prevention however, will not influence the rising skin cancer incidence and prevalence on a short term basis. As a result -- unfortunately -- it is not an important subject for health care insurances. The sense of urgency among dermatologists that skin cancer is becoming an expensive disease (in the U.S skin cancer has taken the fifth position with respect to cancer costs) [16], has not resulted in providing financial stimulus for prevention campaigns by governments nor insurance companies. Primary prevention and secondary prevention should go hand in hand and dermatologists should play an important role in educating patients and future patients in how to reduce the risk of chronic skin malignancy.

General practioners

General practioners (GP) should be trained to recognize skin malignancies and diagnose them at an early stage. This will lead to smaller skin malignancies, which are less difficult and less expensive to treat than large malignancies.[17] We are preparing a large scale training programme for general practioners to recognize and treat actinic keratosis (AK). In an unpublished survey among GP's, it was stated that they have difficulties in recognizing AK and find it important to be trained and supported in recognizing and treating AK. Many patients with chronic skin (pre)malignancy could be followed by the GP and/or a nurse practioner who is stationed at the GPs office once a week. It will be sufficient to see these patients in the dermato-oncology clinic only if the GP is in doubt about the diagnosis, if a squamous cell carcinoma is suspected (and early excision is required) or if there are severe adverse events occurring during treatment. Teledermatology could help to improve efficiency of patient referrals and patient care.[18,19]

GP's should also be involved in prevention campaigns and in the after-care of treated patients (for instance, remove stitches and inform patients of complete or incomplete tumour-removal). A continuous medical education programme for GP's (e-learning and training), will reduce unnecessary or late referrals.

Trained nurses

In the Catharina Hospital, we started in 2004 with a training programme for dermato-oncology nurses. This resulted in special trained dermato-oncology nurses, nurse practioners and physician assistants. Depending on their educational background and clinical experience they perform multiple tasks to relieve the workload for the dermatologists at our dermato-oncology unit.

Biopsies and small standard excisions, including the closure of small defects , are performed by these employees with supervision of a dermatologist. They also perform photodynamic therapy and cryotherapy, give local anesthesia, remove

stitches, and give information on (primary and secondary) prevention and treatments. They inform the patient about the diagnosis, treatment and follow-up. Workflow management helps to reduce the number of hospital visits and dermato-oncology nurses are available to give adjuvant information (mostly by email) in case the patients has a question. A dermatologist is available in the background if needed. Nurse care management interventions have been shown to improve medical, psychosocial and lifestyle outcomes in patients with chronic diseases such as diabetes.[20] Taylor et al show that nurse care managers, working closely with the patients' GP and using evidence based algorithms, can improve medical outcomes, without increasing physician visits.[20] A review of a nurse-led care in dermatology concludes that nurses are managing and treating a number of dermatological conditions, primarily using treatment protocols. Patients report various benefits such as faster access to treatment, reduction in referral to the general practitioner or dermatologist and an increase in knowledge of their condition.[21]

Information technology

To improve work efficiency, quality of care and patient satisfaction, a modern information technology system is needed. Together with Eindhoven University of Technology, we are shaping an information technology system that in the first place will allow to consult, manipulate and retrieve patient-related data. Furthermore, the system shall be pro-active and allow diagnostic and treatment advice for clinically diagnosed lesions at any time.

Over the past years, insights have been gained on how such clinical decision support could be effectively integrated into the care process.[22] The system will also be developed such that communication amongst the health care teams is facilitated, for instance, assisting nurses in ascertaining which actions need to be executed or have already been completed for patients.[23] The potential of this technology has not

been fully exploited in the healthcare domain in general, and certainly not for skin cancer management.[24]

For instance, by using a workflow system at our dermato-oncology unit, it was possible to increase the number of photodynamic treatments performed by a dermato-oncology nurse from 7 to 10 per day. Workflow technology will also be beneficial to further streamline the allocation of work, to monitor work in progress, and analyze effectiveness of treatment patterns for patient subgroups.

A final improvement resulting from the application of IT is the use of email-contact for patients with their dermato-oncology nurse. This reduces the number of telephone-calls (which are more time-consuming then emails) and improves the patient-satisfaction.

Diagnosis and ONE-STOP-SHOP

Instant diagnosis by histopathology should be available to diminish the number of hospital visits and telephone calls. In the Catharina Hospital we are using fresh frozen sections on biopsies on clinically well defined BCC, immediately at the first visit in the hospital. The fresh frozen sections are examined by one of the Mohs surgeons as well as a pathologist to confirm the diagnosis. Patients will be informed about the diagnosis the same day. If planned properly, an excision could take place as follow-up immediately by a physician assistant. In other cases, Mohs Micrographic surgery or PDT can be performed immediately after and follow-up appointments can be planned by the trained nurse.

By this so-called “One-stop-shop diagnosis and treatment”, less appointments are needed (reducing the burden on the healthcare system,) and on the other hand it will improve quality of medical care (especially for most elderly patients and their relatives less hospital visits are extremely welcome).

For pigmented lesions and squamous cell carcinoma, direct excision is possible on a daily basis as well.

Medical treatment

Various treatment modalities are available for dermato-oncology patients. Dermatologists need to use all these modalities in an efficient way. Treatments can easily be combined.[25,26,27,28,29] Periods that patients are in the hospital need to be used as efficiently as possible. While patients are waiting in between Mohs micrographic surgery (MMS) rounds for their aggressive BCC in the face, we perform PDT for AK or superficial BCCs.

For patients with very extensive skin malignancies, like patients with the Nevoid Basal Cell Carcinoma Syndrome, we perform megasessions under general anesthesia. In these treatment sessions, we treat multiple lesions with various techniques (MMS, surgical excision, PDT).[30,31]

In addition, several treatments exist that can be used by the patient at home. This will of course diminish the workload at the outpatient clinic. Patients are able to contact a nurse practioner or special trained nurse if they have questions about the treatment, or about side effects.

Finally, treatment options need to be based on optimal treatment results. Unfortunately, for surgical treatments randomized controlled trials on margins, histopathological examination, etc. are limited. Recently, 5-years results on MMS have become available and these indicate less recurrences after MMS for recurrent facial BCC.[32] In the past, MMS was considered to be time-consuming, and this was a reason not to perform MMS. By incorporating a histopathology lab into the dermatology clinic, it is possible to increase efficiency for MMS. In the Catharina Hospital we perform 6 MMS procedures combined with multiple excisions (for pigmented lesions, Squamous cell carcinoma), PDT and One-stop-shop for BCC .

Conclusion

Skin cancer, including pre-malignancy, is becoming a chronic disease. The enormous increase in skin cancer will force dermatologists to make adjustments in how they run their unit. The disease management system that is set up at the Catharina Hospital Eindhoven is one of the ways to provide an answer to the ever increasing number of patients that need to be treated for skin cancer, but an effective one at that. The system, which is still expanded and developed, combines technological improvements (for instance workflow technology to maximize the number of MMS or PDT treatments) with training of health care workers (nurses, nurse practioners, Physician Assistants, GP's, etc). Additionally, there is a focus on early recognition of lesions by patients and GP's, as well as on prevention of skin cancer.

Finally, the use of One-stop-shop (by the use of frozen sections, already available for MMS) can furthermore increase efficiency. We hope that our ideas and experiences can serve as an inspiration for setting up other dermatolo-oncology units.

Key words: dermato-oncology, skin cancer, management

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