

Melanoma, A Growing Epidemic

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Introduction

In the United States skin cancer is the most common type of cancer. Of the three different types of skin cancer, melanoma is the third most prevalent [1]. Due to the invasive nature of melanoma, it is considered to be the most serious form of skin cancer. Although many consider exposure to ultraviolet (UV) light to be the most critical risk factor in the development of melanoma, for individuals with genetic susceptibility, several other important risk factors remain [2]. Fair skin, blue or green eyes, blond or red hair, skin that burns easily, a history of sunburn early in life and a personal or family history of skin cancer are considered to be additional risk factors for melanoma [3]. Exposure to arsenic and other chemical carcinogens can also cause an increased risk for melanoma [4]. Although the risk of developing melanoma increases with age, it remains one of the most common cancers of young adults. In the past twenty years the number of new melanoma cases has more than doubled. According to the National Cancer Institute 59,940 new cases of melanoma are expected in 2007 resulting in 8,110 deaths [5]. Along with the increased incidence of melanoma, the lifetime risk of developing melanoma has also greatly increased from one in 1500 in 1930 to one in sixty-eight in 2002 [6].

Disease Process and Treatment

Melanoma originates in the melanin producing cells of the epidermis, melanocytes, and commonly begins as a mole or nevi. It is currently believed that exposure to UV light leads to the development of nevi. Nevi are considered a central risk factor for the development of melanoma [2]. Over time melanocytes of a nevi can begin

to reproduce uncontrollably to produce a pigmented lesion on the skins surface [4]. The pigmented lesions typically follow the ABCD method for nevi assessment, A- asymmetrical shape, B- irregular boarder, C- change in color and D-diameter [5]. Although melanoma can occur anywhere on the body they most frequently appear on the upper back and lower legs.

Treatment for melanoma depends on the location, size and severity of the lesion. In advanced metastatic melanoma systemic chemotherapeutic agents are commonly used. Interferon, a biologic response modifier, is used for the treatment of stage III or greater melanoma after surgical excision of the nevi. Surgical intervention can range from a simple excision of the nevi for biopsy to wide excision with lymph node biopsy for treatment of a confirmed case of melanoma. Immunotherapy is a melanoma vaccine used for the treatment of metastatic melanoma. This treatment uses the distinctive cell surface proteins found on some melanomas to act like antigens [4].

Current Recommendations

Decreasing sun exposure is the best way to decrease the risk of developing melanoma. According to the Centers for Disease Control and Prevention (CDC) an individuals risk for melanoma can be reduced by avoiding tanning beds, exposure to sun between 10 a.m. and 4 p.m., wearing sunscreen with at least a sun protection factor (SPF) of 15 or greater, wearing sun glasses, wearing a wide-brimmed hat and seeking shade [1]. Additionally, the World Health Organization recommends that children under one year of age remain in the shade while outside and that individuals attend to the UV index when planning outdoor activities [7]. In order to find and treat melanoma at the earliest possible stage, the American Cancer Society recommends a skin examination every three

years for individuals between 20 and 40 and every year for individuals over the age of 40 [3].

It is currently believed that eighty percent of an individual's lifetime of sun exposure occurs before the age of eighteen [6]. It is because of the long lag time for the development of melanoma after UV exposure, from years to decades, that the full extent of skin damage cannot be appreciated until later in life [2]. As a result of these two factors public health programs for melanoma should focus on both primary and secondary prevention programs. Primary prevention programs should focus on the avoidance of UV exposure in individuals most at risk, those under the age of eighteen. Due to the highly metastatic nature of melanoma, survival depends on early diagnosis and treatment [4]. Therefore, secondary prevention programs should focus on the development of programs or policies designed to facilitate the early detection of melanoma. Frequent screening to detect melanoma early can dramatically improve patient outcomes.

Skin Cancer Prevention/Screening Programs

In 2002 the CDC introduced guidelines for schools that focused on skin cancer prevention. Through the inclusion of specialists in dermatology, pediatrics, public health, and education the CDC utilized a multidisciplinary approach in the development of the program [1]. The program encouraged skin cancer prevention for prekindergarten through 12th grade students and focused on seven recommendations that aimed to change behavior not only at school but in all aspects of the children's lives. Recommendations for policy and environmental changes focused on interventions to decrease exposure to UV light. The establishments of sunscreen routines before outdoor activities and

building modifications to allow for ample shaded areas were a few recommendations of the program [1]. Recommendations for education and family involvement focused on education pertaining to skin cancer, sun-safe behavior and encouraged parents to advocate for sun-safe policies. Professional development recommendations focused on the integration of skin cancer prevention education into preservice and inservice activities for all individuals working with students. State Education Agencies that have received funding through the CDC's Division of Adolescent and School Health (DASH) for the implementation of skin cancer prevention projects include Colorado, Michigan and North Carolina. Detailed information on this program is available on the CDC website [1].

At the 1992 meeting of the United Nations Conference on Environment and Development (UNCED) the agency developed recommendations to address the impact of UV radiation on global health. As a result, WHO INTERSUN-the global UV project was developed. The goals of INTERSUN were to educate individuals on the impact of UV exposure, encourage countries to create plans to decrease UV exposure and to provide guidance to countries and authorities on sun protection programs [7]. A few of the interventions initiated by the INTERSUN program were promotion of the UV index for prevention of excessive UV exposure, implementation of UV protection programs for children and education for national authorities on strategies to protect individuals within their communities from excessive sun exposure. INTERSUN global UV project specifically recommended limited time in midday sun, protection of children from UV exposure, knowledge of the UV index and utilization of shade, sunscreen and protective clothing [7]. The Environmental Protection Agency, US Army Center for Health

Promotion and Preventative Medicine and the Food and Drug Administration are collaborative US agencies that have participated in the INTERSUN program.

In September 2006 the WHO in conjunction with United Nations Environmental Programme (UNEP) and United Nations Educational, Scientific and Cultural Organization (UNESCO) debuted the most recent skin cancer educational program for children, the Ozone Action Education Pack [8]. The OzoneAction Education Pack was developed to educate school-aged children on the impact of UV exposure on health as well as methods to avoid exposure. Among the normally prescribed methods for sun protection the new program encouraged students to look at their shadow in order to gauge sun exposure [8]. The program was made available in English, French and Spanish. Since the program debuted in September, each organization has worked to promote the incorporation of the program into primary school curriculum.

An example of melanoma prevention at the state level can be observed in the 2000 Action Plan on Skin Cancer for Texas. The Texas Department of Health, Cancer Registry of the Texas Department of Health, CDC and Texas Cancer Council (TCC) were the public agencies involved in a variety of skin cancer prevention programs offered through the state. The Physician Oncology Education Program (POEP) is an example of one such program. This program offered physicians self-study course and booklet designed to educate physicians on methods to strengthen communication skills pertaining to the topic of skin cancer with their patients [9]. A similar program was also developed for nurses, Nurse Oncology Education Program (NOEP). The University of Texas M.D. Anderson Cancer Center has offered another outlet for professional and lay group education on risk assessment for skin cancer and recognition of potentially cancerous

lesions. In addition to programs offered to professionals by the state, annually Texas dermatologists have participated in a nationwide day of free skin cancer screening. The American Academy of Dermatology (AAD) has sponsored this program.

In addition to the education offered to medical professionals in the state of Texas, a few school based education programs have also been initiated. Project S.A.F.E.T.Y. (Sun Awareness for Educating Today's Youth), sponsored by TCC, was a program offered to kindergarten through 12th grade students in the state to increase awareness and prevention of skin cancer [9]. In 1999 the Environmental Protection Agency (EPA) sponsored a similar program for Texas elementary schools, the SunWise program. This program was designed to educate students on environmental contributions to skin cancer [9]. Since it was first introduced in Texas, the SunWise program has become a nationally used educational program. To date, the program has been implemented in 14,000 schools and has reached approximately 500,000 students [10].

In October 2006 the AAD debuted a public service advertisement campaign focused on educating teens on the risks associated with indoor tanning. Since seventy percent of indoor tanning customers are Caucasian females between 16 and 49 years of age, it was important to introduce a program focused on preventing the adoption of this risky behavior in teenage girls [11]. In order to convey the message, "Be Safe, Don't Go There, Indoor Tanning Is Out," the campaign utilized peer-to-peer education through the use of print advertisements, radio, television and instant messages (IM) [11]. To help further reach their target population, teenage girls, the program enlisted the help of Miss Maryland 2006, Brittany Lietz, a melanoma survivor. Through the implementation of

this program the AAD hopes to see a decrease in mortality from skin cancer over the next ten to thirty years as this cohort of young women ages [11].

In an attempt to increase public awareness of sun exposure during outdoor athletics the AAD has worked with the Major League Baseball (MLB) and Major League Baseball Players Association (MLBPA) over the last eight seasons. Through this campaign coaches, players, front office staff and their families have been screened for skin cancer [12]. Nearly 15,000 individuals have been screened to date with 500 suspicious lesions detected [12]. In addition to this program, the AAD has worked with Major League Soccer (MLS), U.S. Soccer Foundation and EPA to support the Make Sun Safety Your Goal program [13]. The goal of program has been to educate soccer fans and players on steps that can be taken to reduce sun exposure while at games or practice [13].

To further increase awareness of melanoma, the AAD has dedicated Monday May 1st as Melanoma Monday and May as Melanoma/Skin Cancer Detection and Prevention Month [14]. On May 6, 2006 the AAD worked to set a Guinness World Record for the most people screened for skin cancer in one day. As a part of the campaign, members of the AAD offered free skin cancer screens throughout the U.S. The Navy Pier in Chicago, South Street Seaport in New York, Union Station Mall in Washington D.C., Walt Disney World and Dolphin Resort in Orlando were the primary host sites for screening. An additional 200 screening sites were available throughout the day on May 6th. The goal of the AAD was to screen 5,606 on May 6, 2006 [14].

Recommendations for Future Melanoma Initiatives

Future melanoma prevention programs should continue to focus on primary prevention through programs for children under the age of eighteen. This is of utmost importance since eighty percent of one's lifetime sun exposure occurs before this time [6]. With the increased incidence of melanoma it is also important to target children under eighteen since nearly eighty percent of skin cancer can be prevented by sun protection that occurs before this time [3]. In addition to the programs discussed here future programs should be implemented through pediatrician offices. Since children begin seeing the pediatrician shortly after birth through their teenage years this is a valuable venue for skin cancer education and reinforcement of any education received outside of the office. It also provides a place for parents to be educated on the risks associated with sun exposure since most current programs are geared towards children.

Additional efforts to decrease adolescent exposure to indoor tanning, a cause of melanoma, should be supported through legislation. Since studies have found the effects of indoor tanning to be addictive, efforts should be made to protect children from this unhealthy and potentially addictive habit [11]. Just as the government has set restrictions on addictive substances such as tobacco and alcohol to minors, certain guidelines should be applied to protect minors from the dangerous UV rays emitted from indoor tanning beds. To date only twenty-five states have introduced legislation to restrict the access of tanning beds to youth [11]. The WHO, AAD, American Medical Association and American Academy of Pediatrics support federal legislation that would prohibit access of tanning beds to anyone under the age of eighteen [11].

Since the impact of many skin cancer prevention programs may not be realized for several years, secondary prevention programs should continue to be supported.

Secondary prevention programs encourage and facilitate early detection of melanoma. Programs for secondary prevention should provide education on self-skin examination, risk factors associated with melanoma and sun protection. Additional PSA's should be developed to provide this important information to adults. The AAD's current recommendations for skin cancer screenings by a physician should also be provided to adults. Even though melanoma is the most invasive type of skin cancer, when detected and treated early the cure rate is 95 percent [15]. Evidence of the success of secondary prevention programs can be seen in the improved ten-year survival rates for melanoma. Between 1976 and 1989 the ten-year survival rate for melanoma was 80% and has increased to 88.6% between 1990 and 2001 [16]. This increase in ten-year survival rate provides evidence of the success of secondary prevention programs.

Additional Resources

For additional information please visit the CDC website at www.cdc.gov, W.H.O. website at www.who.int, and the American Academy of Dermatology website at www.aad.org.

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