PUBLIC HEALTH

Sunlight exposure and non-Hodgkin's lymphoma

Epidemiology: Non-Hodgkin's lymphomas (NHLs) arise from the malignant, monoclonal transformation of lymphocytes. As a disease group they encompass a hodgepodge of histological types, cell lines and tumour grades. About 85% of NHLs derive from B cells, the rest from T cells. Low-grade disease predominantly occurs in elderly patients, with indolent courses and median survival times of 5–8 years. High-grade disease accounts for less than 5% of all NHLs and typically presents as rapidly progressive cancer in children and young adults. Intermediate-grade disease is the most common type, accounting for 65% of all NHLs and affecting any age group.[1]

The incidence of NHLs, particularly the intermediate-grade variety, has been rising steadily worldwide over the past few decades. In 1971 the incidence in Canada's male population was 6.2 per 100 000; by 2000 it had risen to 14.5 per 100 000. NHLs are now the fifth-leading cause of cancer in North America, accounting for about 5% of all malignant diseases.[2]

In 1994 Hartge and colleagues[3] examined trends across countries and sites and between lymphoma classifications and concluded that 80% of the rise in incidence of NHL cannot be accounted for by revised classifications or improved diagnostic strategies or therapies. This suggests that most of the rise in incidence is due either to increased exposure to existing risk factors or to the emergence of new etiological factors.

Increased exposure to sunlight, with its resulting immunosuppressive effect, may be one of these factors. Immunosuppression plays a role in the cause of some lymphomas. Transplant recipients are 35 times more likely than the general population to acquire NHL, and the disease is a common manifestation of AIDS. Insights into the link between ultraviolet (UV) light and immunosuppression come from serendipitous laboratory results in the early 1980s, when researchers set out to study the antigenic potential of skin tumours in mice exposed to UV light. Attempts to transplant these tumours into genetically identical hosts failed because the new hosts were able to launch specific immune responses to the tumours. This led to the realization that the repeated exposure to UV light experienced by the tumour-generating mice triggered the production of T-cell suppressor lymphocytes, which interfered with the immune response to these antigenic tumours.[4]

In general, the epidemiologic evidence of an association between sunlight exposure and NHL risk is indirect and weak, but positive. Patients with cutaneous melanomas are at increased risk of NHLs,[5] and rates of NHLs increase with southern latitude and with ambient levels of UV irradiation.[6,7] Because the strength of the association between sunlight exposure and NHL risk is not as great as that observed between sunlight exposure and squamous cell carcinoma or malignant melanoma, some researchers question its validity; however, other researchers think the true strength of the association may be revealed if the lymphoma's subtypes are studied, as has been done with skin cancer, instead of treating NHLs as a single disease entity.

Clinical management: People with NHL may be asymptomatic or may present with a range of features (e.g., painless lymphadenopathy, abdominal mass, weight loss or night sweats) or with symptoms specific to the tumour bulk in the involved sites, such as the tonsils, abdomen, thyroid or lung. All patients require careful staging, which involves a thorough physical examination, CT scanning and bone marrow biopsy. Management is complex and requires referral to a cancer treatment centre. Patients with indolent lymphomas may undergo watchful waiting at first, but eventually they will require treatment with an alkylating agent such as chlorambucil, with or without steroid therapy. The standard chemotherapy for intermediate-grade NHL is several cycles of CHOP (cyclophosphamide, doxirubicin, vincristine and prednisolone), administered intravenously and sometimes supplemented by radiotherapy. Treatment of high-grade NHL is urgent, usually requiring intensive combination chemotherapy. Prognosis and response to therapy depends on the age of the patient and the tumour stage and subtype.[1]

Prevention: Although we do not know what causes most types of NHL, we do know that exposure to sunlight increases the risk of skin cancers and may be associated with the development of NHL. There is no harm in encouraging patients to "slip, slop, slap" — slip on a shirt, slop on some sunscreen and slap on a hat, as our Australian colleagues have done.[8] — *Erica Weir*, CMAJ

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