Commentary: Infection-related cancers in low- and middle-income countries: challenges and opportunities

Edgar P Simard* and Ahmedin Jemal

Surveillance Research Program, American Cancer Society, Atlanta, GA, USA

*Corresponding author. Surveillance Research Program, American Cancer Society, 250 Williams Street NW, Atlanta, Georgia 30303, USA. E-mail: edgar.simard@cancer.org

Accepted 9 October 2012

As non-communicable diseases (NCDs) rise in prominence as sources of morbidity and mortality in low-income and middle-income countries (LMICs), focus on cancer prevention and control activities has increased. These transitions coincide with improved prevention and treatment of infectious causes of death [e.g., tuberculosis, malaria, and human immunodeficiency virus (HIV) infection], whereas NCDs such as cancer and cardiovascular disease related to tobacco consumption and poor dietary practices have increased. These changes also coincide with population expansion and aging in LMICs. In this issue of IJE,1 Remais and colleagues discuss some of the factors contributing to ‘the convergence of non-communicable and infectious diseases in LMICs’ and the importance of aligning existing infectious disease programmes with NCD prevention efforts. Notably, many cancers occurring in LMICs are related to infections that may be prevented and/or treated to preclude the development of cancer. In this commentary we provide a framework with which to consider infection-related cancers, and discuss challenges and opportunities for their control in LMICs.

In 2008, infection-related cancers accounted for 22.9% of all cancers in less-developed countries (including 32.7% in sub-Saharan Africa) in contrast to 7.4% in developed countries.2 Another study found that in 2008, the most common cancers in nations that were low in the Human Development Index (HDI), in which nations are ranked according to life expectancy, education, and gross domestic product, were (in order): cervical, female breast, liver, Kaposi sarcoma (KS), and non-Hodgkin lymphoma (NHL).3 With the exception of female breast cancer, all of these cancers are infection-related: HPV infection for the cervix, hepatitis B virus (HBV) and/or hepatitis C virus (HCV) infections for the liver, KS herpesvirus (KSHV) infection for KS, and Epstein-Barr virus (EBV) infection for NHL. Cervical cancer, KS, and NHL also occur in excess among people with HIV infection and acquired immunodeficiency syndrome (AIDS). A substantial proportion of these infection-related cancers in LMICs are preventable through established public health interventions.

Cervical cancer remains a leading cause of cancer death among women in LMICs (including some African, Asian, and Central and South American countries) because of the lack of screening programmes. The relative absence of such programmes in LMICs is due to a variety of factors including their high cost, immature health-care delivery systems, and a lack of trained health-care workers.4 However, alternative low-cost and effective screening tools, such as visual inspection of the cervix with acetic acid (VIA) and/or HPV testing, are available for use in LMICs.5 Prophylactic vaccination against HPV infection (specifically against HPV types 16 and 18, which account for 70% of cervical cancers) is now a new promise for substantially reducing the future burden of cervical cancer in LMICs. Although widespread vaccination is uncommon in LMICs,6 the HPV vaccine has been successfully introduced in some low-resource countries.7 While the high cost of the vaccine is an obstacle to vaccination, the GAVI Alliance continues to negotiate for price reductions and support for vaccination programmes in these settings. Leveraging existing resources and infrastructure for wider introduction of the HPV vaccine in LMICs would help to address the cervical cancer burden in these areas.

In contrast to the HPV vaccine, the hepatitis B vaccine has been introduced in more than 90% of World Health Organization member states.8 However, hepatitis B vaccine coverage remains suboptimal in several countries, including some sub-Saharan African nations where mortality from HBV-related liver cancer is high and the need for prophylactic vaccination is greatest. Further, only a minority of children
worldwide receive the recommended first dose of hepatitis B vaccine within 24 hours of birth to prevent perinatal HBV transmission. Increasing birth-dose coverage and overall vaccination coverage levels in LMICs are likely to be the most important strategies to address HBV-related liver cancer in these settings. Most HIV infections occur among individuals in LMICs, settings in which oncogenic viruses and infection-related malignancies are also common and HIV-related immune suppression further enhances cancer risk. However, some cancers among people with HIV/AIDS (e.g. KS and NHL) may be prevented with effective HIV antiretroviral treatment (which results in partial restoration of immune function and improved control of oncogenic viruses), suggesting that continued expansion of widespread HIV treatment programmes in LMICs may also have cancer-prevention benefits. Notably, the impact of aging and prolong immune dysfunction among people surviving HIV/AIDS is unknown and an area of needed research, which may also have an effect on cancer transitions in LMICs.

The lack of population-based cancer registration and death certification in LMICs makes it difficult to assess the cancer burden and to prioritize, plan, and evaluate cancer prevention and control programmes in these settings. For example, less than 1% of the population in Africa, 4% in Asia, and 6% in Central and South America are covered by high-quality population-based cancer registration programmes. Until such registration programmes are implemented, one potential way to address this would be to add NCDs to existing infectious-disease reporting and surveillance systems where they exist.

As discussed by Remais and colleagues, in spite of these challenges, opportunities exist to partner with established large-scale public health interventions to address infection-related malignancies in LMICs. Conducting low-cost cervical cancer screenings in partnership with established maternal and child health programmes is one strategy for this. An additional partnership worth exploring is to include cancer prevention and control interventions with the President’s Emergency Plan for AIDS Relief (PEPFAR), which aims to reduce HIV transmission and increase access to HIV care in LMICs (PEPFAR also address TB and malaria). Conducting HBV testing to identify and treat infected individuals could also occur during PEPFAR patient encounters and would likely result in improved outcomes related to both HIV and viral hepatitis. Because HIV, HBV, and HCV share common risk factors, HIV-prevention activities may also help prevent new viral hepatitis infections. In addition, although it is resource intensive, the establishment of long-term prospective cohort studies would inform many unanswered questions about cancer etiology in LMICs, such as how changing dietary, obesity, physical inactivity, and smoking patterns affects infection-related malignancies. Lastly, because medical and public health delivery systems are not yet fully established in many LMICs, routinizing cancer prevention and control practices into such systems might also result in improved cancer outcomes in the future.

The growing cancer burden in LMICs, including the large proportion of infection-related cancers, will place great economic and societal burdens on already under-resourced health care systems. However, wider dissemination of existing knowledge about cancer prevention and control, as well as increased partnership between large-scale public health programmes for the control of infectious disease, may result in meaningful decreases in the cancer burden in LMICs and should be a focus for governments and public health agencies as well as those involved in resource allocation and long-term planning in these settings.

Funding

The authors are supported by the Intramural Research Department of the American Cancer Society.

Conflict of interest: None declared.

References