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REVIEW ARTICLE

A Vision for Global Cancer Medicine: Pursuing the Equity of Chance

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ABSTRACT

At the turn of the century, some claimed that HIV/AIDS was a disease that could not be managed in low-income settings. It was argued that "poor people would not comply with treatment," and that treatment was too expensive and too complicated to deliver. But over the past two decades, data on outcomes have thoroughly disproved this myth. Similar arguments have more recently been made about cancer treatment: chemotherapy was said to be too toxic and too costly and that it required administration expertise beyond that available in low-income settings. We argue that these claims are similarly rooted in ideology rather than evidence. Fortunately, such claims are starting to be refuted by a diverse set of global cancer partnerships around the world that are documenting progress and positive results. In this review article, we provide examples of programs that can give us reason to hope that the treatment playing field is being leveled such that birthplace does not determine survival prognosis. We believe that through strong collaborative efforts and solidarity, the equity of chance can be achieved for patients with cancer worldwide.

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INTRODUCTION

Before the dawn of global funding for AIDS treatment, some in positions of power made immodest statements on the impossibility of delivering effective and safe care to people living with the disease in impoverished places. Because deaths registered in the thousands every day, a ranking US official commented that in the fight against HIV/AIDS, treatment would be unworkable, and that "the best thing to do is behave yourself." A senior US government administrator said in a *Boston Globe* interview in 2001, "We cannot get it done because of conflicts, because of lack of infrastructure, lack of doctors, lack of hospitals, lack of clinics, lack of electricity." Myopic at best, these comments did little to inspire action much less animate policy makers or those who wielded funds.

But there were (and are) two types of people in the world: the conversation starters and the conversation stoppers. In the case of HIV, it was not inevitable that the starters would overcome the stoppers: an impassioned and international movement for access to antiretroviral therapy resulted in unprecedented funding for AIDS treatment. Resources began to stream in from newly established institutions (eg, US President's Emergency Plan for AIDS Relief and The Global Fund to Fight AIDS, Tuberculosis and Malaria), governments created units dedicated to controlling the scourge of the virus, and AIDS incidence and mortality rates soon began to plummet in most countries. The conversation starters showed the value of keeping the conversation alive.

We ourselves were deeply embedded in the decades of service delivery that followed and were privileged to join colleagues dedicated to changing the prognosis for patients with these diseases. But we have also emphasized, and take on the charge in this article, that lessons from infectious disease control are highly applicable to other diseases, including cancer. The debates are similar. Echoes of nihilistic claims have re-emerged from new authority figures regarding the feasibility and cost-effectiveness of delivering safe and effective cancer care in low-resource settings.

Some who have the leverage to rally the world around global access to cancer treatment have instead declared that the world should "focus on prevention," not on treatment. To paraphrase recent remarks of a US official, developing countries should aim to do more with what they have and not invest in medicines and technologies that may be appropriate only for wealthy countries. Many highly effective and potentially curative cancer treatments are based on older affordable therapies. But most impoverished countries often do not yet have the bare minimum of cancer care facilities, clinicians, drugs, and equipment.

For the two thirds of patients whose cancers are not preventable and the other third who may not have the means to prevent their disease despite their will, there are plenty of medicines and technologies that are appropriate. In fact, individuals with treatable and sometimes curable cancers tally in the millions every year and include, to mention a few epidemiologic categorizations, all children with cancer, women with early-stage breast cancer, and men with prostate cancer. Many of the medicines used in the treatment of these cancers are available at low cost; some estimates show drug costs for early-stage breast cancer to be less than $300 for an entire course of care.

As it should be, the expectation of the parents of a child diagnosed with acute lymphoblastic leukemia in the United States is that their child will have a 90% chance of cure. The expectation of a woman with breast cancer in Europe is that she will be diagnosed at an early stage and have an 80% chance of cure. A physician in Boston can truthfully say to a patient with chronic myeloid leukemia that one simple pill, imatinib taken daily, can mean many years, if not decades, of life gained, university attended, jobs obtained, families started, birthdays celebrated, and contributions to society made.

The question now is, Do we have the imagination to prove that global cancer medicine means more than preventing obesity and controlling tobacco use? Are we as individuals and institutions choosing not to be fastened to false dichotomies (ie, prevention *v* treatment) and differential valuations of human life (ie, capping our impetus for therapeutic intervention at three times national gross domestic product per capita)? Are we unwilling to turn our backs on the many patients with potentially curable cancers? Many initiatives are proving that momentum is building worldwide. Here we highlight a few examples.

REASONS TO BE HOPEFUL

After a half-century of progress in oncology service delivery at the Uganda Cancer Institute, a state-of-the-art research, training, and outpatient facility has just opened this year in partnership with the Fred Hutchinson Cancer Research Center (FHCRC). This 25,000 square-foot facility (funded jointly by the US Agency for International Development, FHCRC, and the Government of Uganda) is not only symbolic of a turning tide but will also physically house the infusion rooms, laboratories, and academic facilities to enhance operations at a facility that already cares for more than 20,000 patients every year. More than 50 Ugandan doctors (including eight oncologists) have received training in Uganda or at the FHCRC in the United States. In our view, this is evidence in its purest form that prioritizing the entire continuum of cancer care is possible, and feasible.

A group of committed collaborators in Bangladesh is proving that even one of the most complex therapeutic options for cancer treatment—bone marrow transplantation—can be performed in a resource-limited setting. A partnership between Dhaka Medical College and Hospital and the Boston-based Massachusetts General Hospital led to the dedication of a bone marrow transplantation unit in October 2013. The first autologous transplantation was performed in March 2014 on a patient with multiple myeloma, and many patients have benefitted since then.

In addition, pediatric oncologists in Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Panama, and the Dominican Republic teamed up to create the *Asociación de Hemato-Oncología Pediátrica de Centro América*, which resulted in an exemplary system of knowledge-sharing. As part of an implementation and research collaborative, members have shared clinical protocols for 11 pediatric malignancies for which there are regular formal reviews and sharing of experiences at annual meetings. This partnership has led to substantial improvements in survival outcomes and has been supported by institutions such as St. Jude Children's Research Hospital.[1]

The myth of stigma and purposeful noncompliance as drivers of poor outcomes is also being proved false.[2] Several researchers in Kenya, Zambia, and Uganda have begun documenting the barriers that contribute to a patients' inability to complete treatment.[3-6] Unsurprisingly, the most common reasons for patients being lost along the continuum are structural: limited or no financial resources, lack of health insurance, long distances to health facilities or no transportation options, and poor communication to parents about a child's cancer, its causes, and the benefits of treatment. To build or bolster a care pathway for patients who face structural barriers to care, we need to remember who we should be taking our cues from: the patients and their families.

On the national and international stage, major institutions are taking a stand, too. The National Cancer Institute (NCI) in the United States opened its Center for Global Health in 2012 and has since supported initiatives that include implementing science research and knowledge-sharing, academic partnerships with low-income countries and investigators, and low-cost, high-impact cancer care technologies. Its third annual Global Cancer Research Symposium was held in March 2015. At the encouragement of the NCI, Centers for Global Cancer Medicine have been established at several major cancer hospitals around the country, including the Dana-Farber Cancer Institute (DFCI).

The Union for International Cancer Control (UICC) has played a major role in the global cancer movement for decades and supports a broad set of activities. Their work has been instrumental in building local human resource capacity, establishing cancer registries and care delivery platforms, funding research projects, and supporting young leaders from low-income countries who plan to pursue careers in oncology. Recently, the WHO invited a full review (led by the UICC and DFCI) of cancer drugs on its Model List of Essential Medicines for which outcomes were revealed in May 2015, and 16 new cancer medicines were added to the List. This result promises to lead to greater access to cancer medicines worldwide.[7] The American Society of Clinical Oncology and the European Society for Medical Oncology also have substantial international initiatives aimed toward improving global cancer medicine. For example, the American Society of Clinical Oncology just launched the *Journal of Global Oncology*, a new, open-access journal dedicated to sharing best practices and research in this area.

Today, there is neither a Global Fund for Cancer nor a President's Emergency Plan for Cancer Relief. But with the calls to action being made,[8] and with the groundswell of engagement, as in the examples mentioned earlier, we believe that we are now reaching the dawn of global funding for cancer care. To make our case, however, we must continue to demonstrate constant programmatic evaluation, report on successes and gaps, and remain nimble in our service delivery platform. This was the case for HIV and tuberculosis.[9,10]

In Rwanda, where we work, investments in strengthening the health system and methodical structuring of the platform for delivering care for infectious diseases (ie, bringing the front lines of prevention and treatment to Rwanda's 15,000 villages) resulted in significant reductions in premature mortality.[11] A nation only 20 years out from a genocide that claimed approximately one million lives now boasts universal access to antiretroviral therapy, a life expectancy in the 60s, and the highest coverage for human papillomavirus vaccination in the world.[12] And on the site in rural northern Rwanda where an old military base once stood, now sits the Butaro Cancer Center of Excellence inaugurated by former President Bill Clinton in July 2012.[13]

Since opening the Center's doors 3 years ago, nearly 300 children have been seen, and more than 3,500 patients overall have received care. The Ministry of Health has approved national protocols for the treatment of 17 cancers, and it just held its second National Pediatric Oncology Protocol Review with experts from the DFCI and other institutions from around the world, during which four new pediatric tumors were added. A revised National Essential Medicines List for Cancer was approved in 2015 having added 11 new agents in one year. Advanced pathology and tele-pathology systems have enabled reductions in turnaround time from several months to 1 to 3 weeks. A growing cadre of health professionals—four physicians and 20 nurses—have been trained by Partners In Health and DFCI clinicians. The majority of the 3,000 patients were seen in this past year alone, confirming the "if you build it, they will come," theory; this volume is the tip of the iceberg of the cancer burden in Rwanda.

CONCLUSION

The imperatives to treat cancer are trifold: moral, economic, and epidemiologic. And it appears that we are closer than ever before to our goal of increasing access to cancer care for the poor. In this review article, we have described a handful of initiatives that can advance the dialogue from a debate about whether to treat to how to treat. In Uganda, we witnessed the power of partnership and the necessity of having a "there" there: to deliver cancer care, one needs the space, the stuff, the staff, and the system, all of which the partnership addresses. In Bangladesh, an initiative to conduct bone marrow transplantations further proves that a failure of imagination is often the only blockade to action and that complex interventions are possible with strong partnership. The collaborative group in Central America demonstrates the impact of a regional approach to knowledge- and experience-sharing. Myth busters in east Africa show us that we are too quick to blame stigma when the issues are actually structural. Broad-reaching entities such as the UICC, the NCI, and the WHO provide examples of global commitments and activities.

Rwanda's cancer program is a narrative of unlikely achievement: few would have bet on this postconflict nation being home to one of the region's first rural cancer centers. And until 2012, there were uncounted thousands of patients who perished unnecessarily from cancer in Rwanda. But changes are occurring rapidly here and globally. Despite the tendency of some institutions to be selectively exposed to data on prevention (*v* treatment), the aforementioned examples prove that the flywheel is now turning. All of us must turn our attention to the full continuum of care—from awareness through treatment or palliation—and ensure that funding strengthens the entire cancer care system, integrating preventive, curative, and supportive services instead of separating them.

The role of clinicians and researchers involved in global cancer medicine should be one of leveling the playing field, such that one's birthplace does not determine one's chance of surviving a treatable illness. In other words, as a global community, we must commit to increasing access to high-quality cancer care and join together to pursue the equity of chance.

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