Focus on Onyinye Balogun

By Virginia Greco (CERN)

A graduate of Harvard University and Yale University School of Medicine, Onyinye Balogun is an attending Radiation Oncologist at Cornell University. In addition to her clinical duties, she is engaged in global health projects focused on cancer care. She is a member of the International Cancer Expert Corps (ICEC), whose main aim is to reduce mortality and improve the quality of life of people suffering cancer in low- and middle-income countries (LMIC), and in particular she is involved in various educational projects oriented at training radiotherapy professionals in those countries. We talked with her about her interest in this cause and her experience in the field.

Why and when did you decide to invest time and energy in contributing to the diffusion of radiation therapy for cancer treatment in low and middle-income countries?

My paternal aunt/godmother died of breast cancer when I was about 12 or 13 years old. Before she died, I visited her in Nigeria and she showed me her scars. (Due to my lack of medical knowledge, I thought her scars were due to surgery but when I came across the pictures I'd taken of my aunt many decades later, I realized her scars were due to radiotherapy side effects!) Shortly after her death, I developed a vendetta against cancer which led me to pursue medicine. After college, I spent a year in Ibadan, Nigeria, working with a breast cancer advocacy group and working to start a clinical trial. During my time there, I helped to run a weekly Q&A session within the radiotherapy clinic in Ibadan. I had no medical experience so I had to read a great deal about cancer and radiotherapy to try and answer the patients' questions. I guess my time with my aunt and my year in Nigeria laid the seeds subconsciously for my decision to get involved in radiotherapy for LMICs.

How did you get involved in ICEC?

I first met Norman Coleman in the fall of 2014 when my chair, Dr. Silvia Formenti, introduced us to one another. ICEC sounded like a promising venture so over time I became more involved. Mentors like Dr. Formenti and Dr. Brereton have taken me under their wing and the organization has truly encouraged my passion for improving healthcare in LMICs. I feel very fortunate to have ICEC's support.

You focus mainly on education and training of medical doctors, radiologists and nurses living and practicing in resource-poor countries. Could you explain what kind of activities you are carrying out and their goal?

Radiation therapy is an important component of cancer care globally. Until the mid-1980s, radiation therapy plans were designed using two-dimensional X-rays with bony anatomy landmarks serving as guides for field definition, reference points set at specified depths and dose calculated by hand. Access to computerized tomography (CT) and magnetic resonance imaging (MRI) has enabled the design of plans using three-dimensional images and computer algorithms. Three-dimensional conformal radiation therapy (3-DCRT) has been in widespread use in developed nations since the 1990s. In contrast, radiation therapy centers in developing nations are just beginning to

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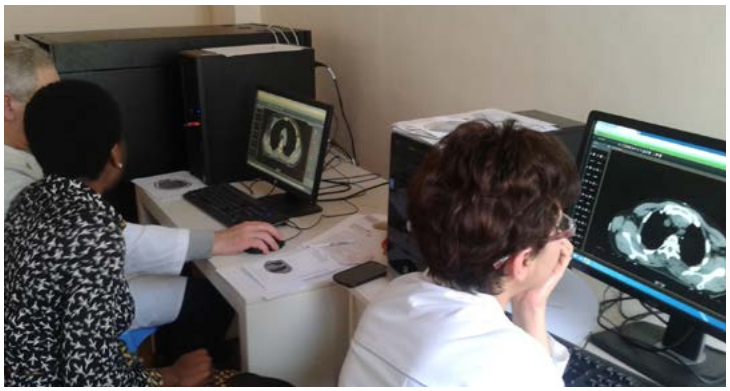

Onyinye Balogun designed a 2-week pilot curriculum for implementing 3-DCRT for breast cancer. The National Center of Oncology in Yerevan, Armenia was the pilot site in 2015.

Balogun (in the centre) with her colleagues at the National Center of Oncology in Yerevan, Armenia.

Balogun in front of the National Center of Oncology in Yerevan, Armenia.

adopt this technology. Standardized means for assisting radiation therapy professionals as they transition from 2-D planning to 3-DCRT are lacking. In response to this need, I designed a 2-week pilot curriculum for implementing 3-DCRT for breast cancer. The National Center of Oncology in Yerevan, Armenia was the pilot site in 2015. Ten RT professionals participated in the pilot curriculum (6 ROs, 2 MPs, and 2 RTTs), which was designed to provide them with the basic foundations of 3-DCRT and confirmed the feasibility of the model for wider application. As a result, we received a grant from the Cornell Institute of African Studies to implement the breast curriculum in Libreville, Gabon. We hope that this will aid centers in delivering radiotherapy safely to patients.

What was the outcome of this project in Armenia and what did you learn from this experience?

It confirmed the feasibility of implementing in a LMIC setting a curriculum that would improve physicians' level of comfort and familiarity with 3-DCRT. The physicians found the exercises that were provided via an online module, Educase, particularly helpful. The experience also highlighted potential areas of improvement i.e. running the curriculum while balancing the physicians' need to tend to busy clinics. It also highlighted the need for more training geared toward radiation therapists who are responsible for the day-to-day positioning of patients on the machine and treatment.

What are the next projects you are going to work on?

One project is to test the pilot curriculum for breast 3-DCRT in Libreville, Gabon.

In addition, we plan to expand the curriculum in Armenia to gynecologic tumours, since they pose a serious threat to the health of Armenian women. Studies of cervical cancer patients have demonstrated that survival is improved when 3-DCRT is used rather than 2-D techniques, most likely because of a better ability to visualize the tissue of interest and deliver dose to this region. In addition, healthy surrounding organs receive a lower dose.

At present, the gynecological patients in Yerevan are treated using 2-D techniques but there is a strong desire to take advantage of the CT scanner and pass to 3-DCRT. This project aims at pilot testing a two-week long curriculum to train radiation oncology professionals in the key processes associated with 3-DCRT implementation for gynecological cancers, in particular: patient positioning for CT scans; delineation of tumor target volumes and organs at risk for radiation damage; design of beam shapes and positions to spare normal tissues. We also seek to expand the training component for radiation therapists, the workers who position and treat the patients each day. Finally, we will pilot test the use of a teleconferencing platform that will connect Weill Cornell Medicine and the National Center of Oncology, with the goal of facilitating feedback on 3D plans. Telemedicine has been posited as a potential means of bolstering radiation therapy delivery in developing nations. This effort will be led by Dr Matteo Botteghi, who designed and successfully piloted "Share and Meet" - a novel intercontinental teleconferencing platform oriented to oncology specialties - in Mwanza, Tanzania in 2015. Among its many functions, this platform conveys the ability to share radiology images and patient medical records for diagnostic and care purposes. The National Center of Oncology in Yerevan, Armenia acquired a CT simulator and a new Elekta linear accelerator in 2015. This is the first center to implement 3-DCRT in a nation of 3.3 million people.

We know that money is a crucial barrier, which prevents these countries from improving their health system and, specifically, from making radiotherapy available to a large fraction of their population. What kind of solutions can we envisage to overcome this problem and reduce the cancer divide between countries?

One goal is to work with manufacturers to innovate machines that are better suited to function in LMIC settings (i.e. machines that take into account an unsteady electricity source) and that are more affordable. Another is to work with governments to determine how resources can be shared amongst countries. For instance, there are ~27 African countries with no radiotherapy machines. For each country to build its own radiotherapy units may be cost-prohibitive. Perhaps there is a way for neighboring countries to pool their resources so that at least in the immediate period they can jointly create radiotherapy services and finance their citizens travel to the agreed upon site of the jointly shared radiotherapy machine. ■