COMMENTARY

SERVE Ethiopia

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Editor's Note

For a larger overview of the World Health Organization's approach to chronic disease, please see Tom Judd's companion piece to this article on page 65.

Chronic Disease and The World Health Organization

It is estimated that 35,000,000 people died from chronic diseases around the world in 2008. Every year, more than 60% of all deaths worldwide are because of chronic disease. The World Health Organization (WHO) reports that for the first time in history deaths from chronic diseases will soon exceed deaths from communicable diseases, maternal and perinatal conditions, and nutritional deficiencies combined in low-income countries.[1]

According to WHO, comprehensive and integrated action is the means to prevent and control chronic disease.[2] In developing countries, such as Ethiopia, chronic disease is a growing problem. Like many other chronic diseases, the incidence of chronic kidney disease (CKD) in Ethiopia is rising because of increased risk factors such as high blood pressure and diabetes mellitus.[3] Despite the high prevalence of HIV in Africa (25% in some antenatal clinics), HIV nephropathy incidence is fairly low. In Africa, End Stage Renal Disease (ESRD) remains a mostly fatal disease.[4] Treatment considered the norm in industrialized countries is limited in Africa: dialysis is dependent on the availability of funding and charitable contributions.[5,6] Few governments cover the cost of renal replacement therapy. For a variety of reasons, primarily financial, medical care in third world countries is inadequate at best, especially for expensive chronic illness treatment therapies such as dialysis and transplantation.[5,6]

Getting Involved

Because of my involvement in nonprofit work for the poor with kidney disease, I was approached, in 2007, by the family of Yeneneh Betru, MD, to help them set up a dialysis center in Ethiopia. Dr Betru grew up in Ethiopia and received his education in the US. He trained as a hospitalist and worked at St Joseph's Hospital in Burbank, CA. After becoming a physician, Dr Betru returned to Ethiopia to care for his dying grandmother. Despite his knowledge of western medicine, he was unable to help her and she died. Concerned because the hospital where his grandmother spent her final days lacked specialty care, he asked Ethiopian physicians what could be done to improve the care of patients in Ethiopia. The response was "we need dialysis machines."

Upon returning to the US, Dr Betru enlisted his family to start a foundation focused on providing dialysis services to the poor in Ethiopia. On September 11, 2001, Dr Betru was killed when the airplane he was on crashed into the Pentagon. Since then the Betru family has been trying to open a dialysis unit for the poor in Ethiopia. Through donations, they were able to purchase several dialysis machines and to ship them to Ethiopia; however, without an accepting physician, the machines were quarantined in the Ministry of Health where they remain—of use to no one.

My work with the Foundation to Improve Renal Nutrition in the Antelope Valley (www.firnav.org) brought the Betru family to me seeking help in forming a nonprofit organization to provide dialysis services to people in Ethiopia who could not afford them. The Dr Yeneneh Betru Foundation (www.yenbfoundation.org/) was founded and began searching for a hospital to sponsor the program and to fulfill the dream of Dr Betru. On September 11, 2008, along with other members of the Dr Yeneneh Betru Foundation, I visited Bethel Hospital in Addis Ababa, Ethiopia to dedicate a dialysis center to serve the poor with kidney disease.

People with ESRD require Renal Replacement Therapy (RRT)—dialysis or kidney transplantation—to maintain life. The treatment of ESRD is expensive and not covered by the national health care program in Ethiopia. The Dr Yeneneh Betru Foundation believes that if we can develop a model of care to help the poor in Ethiopia, the lessons learned could be used to help the poor in other low-income countries.

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Ethiopia

Approximately 82 million people live in Ethiopia,[7] a population greater than Canada, Portugal, Australia, and Greece combined. The life expectancy in Ethiopia is estimated at 53 years for men and 57 years for women. About 40% of the population lives in abject poverty. The annual gross domestic product is only about $56 billion and the gross domestic product per capita is about $700.[7] Anecdotally, I was told that a nurse working in a community hospital earns about $1200 per year and the average salary for a physician in the same hospital is about $24,000 per year.

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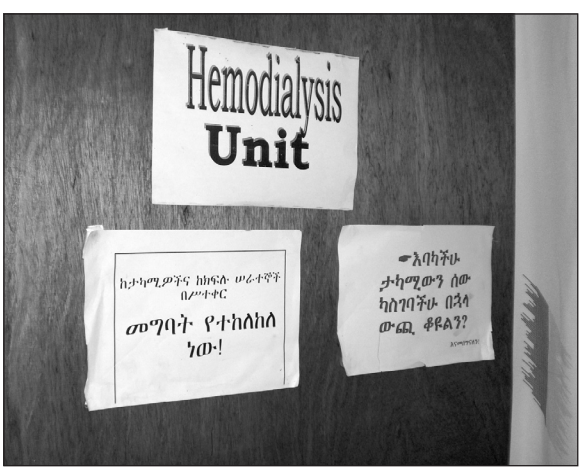
The health status of the Ethiopian is extremely poor. Ethiopia's main health problems are communicable diseases caused by poor sanitation and malnutrition. These problems are exacerbated by the shortage of trained nurses and clinicians and of health facilities. In 2000, there were 103 hospitals and 338 medical centers in Ethiopia. There are only two medical schools in Ethiopia and Ethiopians share fewer than three physicians per 100,000 people.[8-10]

Poland has 200 dialysis centers; Spain has 400. By comparison, Ethiopia with a population twice that of Poland and Spain combined has only two dialysis centers and two nephrologists. The country is challenged by emigration with many educated professionals leaving Ethiopia for a better economic opportunity in the West.[11,12]

Renal Replacement Therapy in Ethiopia

There are virtually no published reports on the incidence, prevalence, or survival of patients with kidney disease in Ethiopia. In most sub-Saharan African countries, the majority of patients with kidney disease die because of lack of treatment.[13] While in Ethiopia, I observed that there were only about 20 functioning dialysis machines treating fewer than 100 chronic dialysis patients.



The Hemodyalisis Unit at Bethel Teaching Hospital.

Dialysis services in Ethiopia are limited because of cost and availability. During my trip I found that at Bethel Hospital, the cost of a dialysis treatment is about $100 US. Because most of the people on dialysis are poor, this is a prohibitive cost. While rounding at the dialysis center, I saw many patients who only come to the dialysis center once a week because that is all their families can afford. Routine laboratory tests are not performed. Most patients have a noncuffed catheter because hospitals do not have access to cuffed catheters. Most catheters are placed in the subclavian vein—with a high risk of stenosis—and do not have sutures at the exit site. Artery-to-vein fistulas used for dialysis access are extremely rare (less than 10%).

On dialysis rounds, I discovered that an internist with no training in dialysis wrote most of the dialysis orders. Most patients had a standard order for dialysis with minimal changes in the script based on the patient's current health care status. On dialysis rounds I saw that most patients did not have recorded pre- and/or postdialysis weights. Some patients were chronically fluid overloaded and others were chronically fluid depleted. For example, one patient was significantly fluid overloaded (from deficient ultrafiltration) with uncontrolled hypertension; after increasing fluid removal during dialysis her blood pressure returned to normal. Another patient complained of severe cramps (from excess ultrafiltration) one hour into dialysis each time he was treated. Because his treatment was so painful, he avoided treatment more than once a week. His symptoms were resolved with two liters of normal saline.

Exacerbating the issues of cost and lack of availability is the lack of education. There are no renal dietitians or renal social workers in Ethiopia. For most chronic disease, this has a profound effect. One example of the hazards of poor education is mango juice. At the clinic, I found two patients with mango juice at their bedside. Mango juice is a common drink in Ethiopia: it is purchased in the concentrated form and diluted to taste. Mango juice is very high in potassium (1/2 cup contains 323 mg of potassium) and could be lethal to a patient with ESRD whose daily potassium intake is not to exceed 2000 mg. ESRD prevention and pre-ESRD care are essentially not existent. I met an endocrinologist who cares for patients with CKD and diabetes who noticed an increase in incidence of CKD over the last year mainly from type 2 diabetes associated with obesity. Because there is no treatment

for ESRD in Ethiopia, patients are unwilling to get screened for this fatal disease. Most patients admitted to the hospital that I saw on rounds had blood urea nitrogen levels >300 mg/dL (normal value 7-21 mg/dL). Blood hemoglobin levels were also very low, averaging <6 gm/dL (normal values 12-18 gm/dL). For financial reasons, erythropoietin used to treat anemia in ESRD is not available. Blood transfusion to treat anemia requires a family member to donate a unit of blood before a family-member patient can receive a unit of blood. No donation, no transfusion.

How to Improve Access for Renal Replacement Therapy in Ethiopia?

I believe that developed countries and clinicians from around the world should unite to develop a "Health Corp," similar to the Peace Corp, to provide in-kind support (supplies, medications), volunteer time, and intellectual assets (free Web site tools, access to recent publications in kidney disease management, etc) to help overcome the health care deficits in low-income countries like Ethiopia. Medical universities could require students, residents, and fellows to spend at least one month of their training in low-income countries. This would have an immediate effect on the ability to provide preventive services to Ethiopians while expanding the knowledge base of students before they go into general practice.

To address the CKD problem of Ethiopia sustained efforts from nongovernmental organizations (NGOs), governmental agencies, the pharmaceutical industry, and medical training programs are needed. The goal is to prevent renal failure and death from renal failure. To achieve this goal, development of a high-quality chronic dialysis program is needed. In countries like Ethiopia, most patients will not have access to therapy for kidney failure. With limited resources, the focus must be on detection and prevention of kidney disease. However, as part of this effort it is important to lay the foundation for effective care programs to treat advance stages of kidney disease, including treating kidney failure with dialysis. Patients with ESRD must receive dialysis services to maximize the number of patients who will benefit from this lifesaving procedure and clinicians must have the tools to effectively treat renal failure. By providing ESRD services it is also hoped that more people will be screened for kidney disease because treatment for disease would then be available.

In most low-income countries, health care spending is supplemented by user fees and supplemental aid from outside the country. Because Ethiopia is several decades away from becoming a middle-income country with a national health care program, funding for prevention and treatment must come from private and NGO sources, such as in-kind donations and volunteer programs. A mixed model of care may be a way to subsidize health care services for the poor. Malaysia provides its dialysis services via a blend of model of care of public hospitals, for-profit private centers, and not-for-profit organizations, such as religious groups, the National Kidney Foundation and the Rotary club.[14]

Dr Yeneneh Betru Foundation Advisory Board Members (left to right): Steven Warshawsky, Dr Susanne Nicholas, Dr Philip Tuso, Maureen Woodson, Mary Mosser, Ruth Betru, Sirak Betru.

Conclusion

Medical leaders from around the world are aware of the potential kidney disease burden in Africa. In an attempt to make a significant impact on the future burden of kidney disease, medical leaders should try to work with local policy makers, business leaders, pharmaceutical companies, and clinicians to develop population care management programs that focus on education, early detection and effective treatment to prevent and to slow down progression of kidney disease.

In summary, to help reduce the current and future burden of kidney failure in Ethiopia, there must be:

- a continual supply of volunteers to reduce the cost of care and to provide current information on evidence-based guidelines and professional standards
- a continual supply of in-kind donations to reduce the cost of care from consumables

- cooperation with pharmaceutical companies to provide generic medications to help treat anemia, diabetes mellitus, high blood pressure, vitamin deficiencies, and bone disease.

The burden of kidney failure in Ethiopia is concealed behind statistics that reflect only the number of people treated, not the number who die of kidney failure. Clinicians must focus on the early detection, prevention, and management of kidney disease. There should be registries to determine the true prevalence of kidney disease in Ethiopia. Dialysis services will need to be affordable and very cost-effective by using in-kind donations, government cooperation, and volunteerism.

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However, to make a real difference in the lives of Ethiopians who have kidney disease, physicians and leaders from industrialized countries must be proactive. Globalization will result in an increase in the number of people in low-income countries with diseases that cause kidney disease. Low-income countries will not be able to develop the medical infrastructure to handle the newly discovered disease burden. To bridge the gap in needed health care services, the Health Corps program I have proposed will need volunteers and in-kind donations from high-income countries. It must be an organized effort that will be a clearing house and recruitment tool for volunteers and donations to drastically change the delivery of needed services to patients in third world countries. For more information about how you can help treat kidney disease in Ethiopia, e-mail me at phillip.j.tuso@kp.org. ❖

Disclosure Statement

The author has no conflicts of interest to disclose.

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A Good Thing

Can we ever do too much of a good thing?

— Miguel de Cervantes, 1547 – 1616, Spanish novelist, poet, and playwright