Challenges in using cardiovascular medications in Sub-Saharan Africa

Berhe, Derbew Fikadu

4 Brief Outline of Ethiopian Healthcare Set Up and Field Study

Geographic location and population size

Ethiopia is located in the North-Eastern part of Africa (also called Horn of Africa). The country occupies an area of 1.1 million square kilometers. With more than 100 million inhabitants, it is the second most populous country in Africa after Nigeria, and the 14th most populous country in the world. The country is home of a variety of nations, nationalities and peoples with more than 80 different spoken languages. The age structure of the population has remained predominately young: 44.9% under the age of 15 years, and 52% in the age group of 15 and 65 years. Elderly population (> 65 years) accounts 3% of the total population [1].

Health service structure

The Ethiopian health service is structured into a three-tier system with primary, secondary and tertiary levels of care, Figure 1 [1].

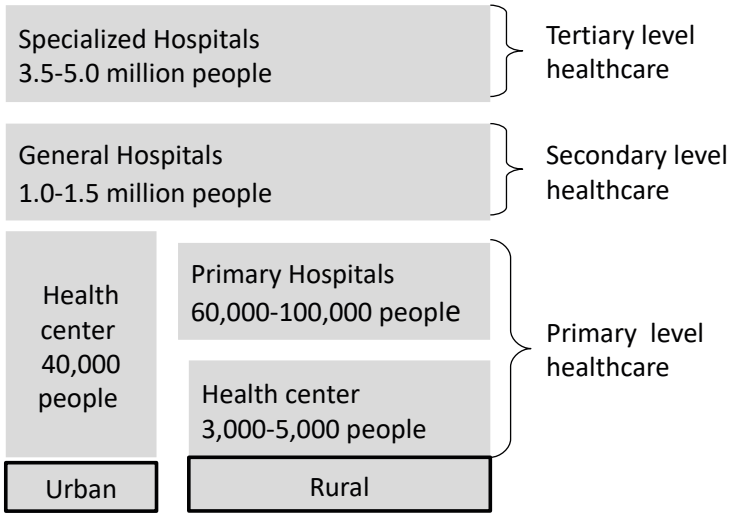

Figure 1: Ethiopian Health Tier System
Figure was adapted from Ethiopian Health Sector Development Program (HSDP) IV

At the primary level healthcare facilities provide preventive, and curative services for the majority of the population for the most common diseases. These facilities include health posts, health centers, and primary level hospitals. In the health post, health extension workers (HEWs) provide mostly homebased services. These HEWs are a one year trained mostly females non-HCPs. They provide community-based primary care which is feasible in low-resource settings. The health center staff usually consists of nurses, midwives, health officers, and (a) pharmacy technician(s). Primary level hospitals additionally employ medical doctors. The higher level of care serves as referral center to the lower level. In urban areas large(r) health centers combine function and staff of the three primary level healthcare facilities [1].

Secondary and tertiary level health care centers exist of general respectively specialized hospitals, with the latter having a more specialized medical and nursing staff. They also play a larger role in HC organization.

According to the latest Health Sector Development Program (HSDP), the country has 16,440 health posts, 3,547 health centers and 311 hospitals. Most of the tertiary level hospitals (n = 28) are often training centers for medical and para medical students [1].

Disease prevalence

Until recently, communicable diseases were the leading causes of mortality and morbidity in Ethiopia. As in most African countries an epidemiologic transition from communicable to non-communicable diseases can be observed in Ethiopia [2]. Non-communicable diseases in Ethiopia was estimated 800 per 100,000 population of which the most common causes of death are cardiovascular diseases (≅ 450 per 100,000) (3). Prevalence of hypertension in Ethiopia is reported in range of 10–30% [4–6].

In this thesis, we have performed two studies to describe treatment practices, outcomes and patient experiences in hypertensive patients attending outpatient hypertension clinics in general and specialised

Table 1: list of included hospitals

Addis Ababa	Tigray Regional State
Tikur Anbasa (S)	Mekelle (G)
St Paul's (S)	St Mary Axum (G)
Yekatit 12 (G)	Lemlem Karl Maychew (G)

S, specialized hospital; G, general hospital

hospitals in Ethiopia. We recruited hospitals in two regions: Addis Ababa and Tigray regional state.

Data reported in the studies presented in chapter 5 and 6 were collected using a single study protocol and were collected between February and August in 2015. The study protocol was developed by a team of researchers [DFB, KT, FMHR, PGM] in Groningen, the Netherlands and Ethiopian counterparts from Addis Ababa [YWT] and Mekelle [AM]. Informed consents were obtained from all participants (968).

The collected data comprised of

- Social demographic variables: age in year, gender, smoking history, alcohol use, marital status, and educational status
- Hospital type: general versus specialized
- Disease characteristics: blood pressure level (< 140/90 mm Hg controlled BP), cardiometabolic comorbid illnesses (diabetes mellitus (DM), dyslipidemia, kidney disease, heart failure/myocardial infarction)
- Treatment characteristics: drug type, dosing schedule and class, treatment duration, medication adherence, treatment satisfaction

Data were recorded on paper case report forms (CRF) by data collectors in each hospital and transcribed to the electronic CRF by trained pharmacist and double checked by DFB/researchers. All data entry was reviewed and supervised by DFB. PGM checked a random sample of 100 cases. DFB (two or more) and PGM (single) performed supervision visit(s) to all H health care facilities during data collection.

The study data were used to answer two main research questions;

1) What proportion of hypertensive patients on antihypertensive medication had their BP controlled and the determinants?
2) What is the impact of ADEs experience and treatment satisfaction on antihypertensive medication adherence in Ethiopia.

The results of these studies are reported in chapter 5 and 6 respectively.

References

(1) Federal Democratic Republic of Ethiopia Ministry of Health. Health Sector Transformation Plan 2008-2012EFY (2015/16–2019/20) http://www.moh.gov.et/documents/26765/0/Health+Sector+Transformation+Plan/5542a23a-9bc7-46a2-8c1f-8b32c2603208?version = 1.0 : Ethiopia Ministry of Health; 2015.

(2) Misganaw A, Mariam DH, Ali A, Araya T. Epidemiology of major non-communicable diseases in Ethiopia: a systematic review. *J Health Popul Nutr* 2014; 32:1–13.

(3) Abegunde DO, Mathers CD, Adam T, Ortegon M, Strong K. The burden and costs of chronic diseases in low-income and middle-income countries. *Lancet* 2007 Dec 8;370(9603):1929–38.

(4) Adeloye D, Basquill C. Estimating the prevalence and awareness rates of hypertension in Africa: a systematic analysis. *PLoS One* 2014; 9:e104300.

(5) Abebe SM, Berhane Y, Worku A, Getachew A. Prevalence and associated factors of hypertension: a crossectional community based study in Northwest Ethiopia. *PLoS One* 2015;10:e0125210.

(6) Kibret KT, Mesfin YM. Prevalence of hypertension in Ethiopia: a systematic meta-analysis. *Public Health Rev* 2015;36:1.