

Successful Simultaneous Screening of Sickle Cell Disease, HIV and Tuberculosis in Rural Guinea Bissau, West Africa through Rapid Tests and a Standardized Clinical Questionnaire: An Outreach Program Due to a Public–Private Partnership

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Abstract

Introduction: Previous studies demonstrated that sickle cell disease (SCD), HIV and Tuberculosis (TB) represent high, yet under recognized health issues in Guinea Bissau, West Africa. A public National Reference Center for TB, Hospital Raoul Follereau (HRF) managed by the Italian NGO AHEAD is present in the capital city of Bissau with specialized local health staff capable of managing HIV and TB; the hospital has a SCD Clinic. Access to health services for rural population is limited and in some villages basic health care and routine screening are also seldom available due to lack of resources, specialized staff or diagnostic capacity. Therefore, people are not diagnosed or diagnosed late for SCD, HIV, TB. Nevertheless, rapid tests for both HIV and SCD are available on the market and one for TB is being developed. Simultaneous screening of three big diseases at the point of care (POC) in rural areas would allow saving of time and resources, while identifying people in need of further specialized diagnostic or follow up.

Objectives: To evaluate the feasibility of simultaneous screening of HIV, SCD and TB at the POC in a rural area of Guinea Bissau through rapid tests for HIV and SCD and a standardized clinical

questionnaire (Figure 1) with clinical examination for TB. To identify patients with HIV, SCD or both and enroll them in appropriate follow up programs; to identify suspects of TB eligible for in depth diagnostic screening.

Methods: During the first phase of the project a temporary outreach health post was organized for 10 days in March 2018 in the village of Fanhè, by the NGO AGB already operating in the village. 1) The chiefs of the rural community village informed all the households through collective meetings and home visits regarding the objectives and modalities of the health project after accepting the proposal made by the NGOs and the HRF staff (February–March 2018); 2) the local chiefs organized a schedule of visits according to households; 3) 3 nurses and 2 physicians from the HRF in Bissau, linguistically competent for Creole and local dialects, administered the standardized questionnaire and the physical examination respectively; 3) 2 pediatric residents from Italy aided in clinical examination, a nurse and 2 other physicians in performing the rapid tests for HIV (Determine®) and SCD (Sickle Scan, Biomedomics) after informed consent; patients with Sickle Scan positive results were immediately collected another blood sample on Guthrie card for molecular analysis confirmation to be performed in Italy at the Azienda Ospedaliera Università di Padova. During the second phase of the project (April–May 2018) subjects with suspect of TB and/or HIV received free transportation to the HRF for TB diagnostic evaluation according to the national protocol and second HIV confirmatory test.

Results: All 898 inhabitants (32 families) accepted the screening and performed clinical examination with clinical questionnaire; all performed the finger prick for HIV and SCD rapid test. At SickleScan 16 were HbSA (children 9/16); none were HbAC or HbSS. All received information on the carrier state. At Determine 61 were HIV positive (children 9/61). 93 presented clinical suspect of TB (children 33/93). 12 had a suspected of TB and were HIV positive(children: 2/12). For subjects with a suspect of TB or who were HIV positive free transportation was arranged to the HRF for complete TB diagnostic workup and second HIV confirmatory Rapid Test. All HIV positive tests were confirmed and patients enrolled in clinical care in a nearby village; 30% of patients with TB suspect had the diagnosis confirmed by Xray/sputum smear examination and were enrolled in appropriate care programs. All 16 SickleScan positive HbSA samples underwent molecular analysis and the results were confirmed.

Conclusions: This pilot study demonstrate the feasibility of a simultaneous population screening at the POC in rural areas for three "big diseases" (SCD, HIV and TB) through a temporary outreach clinic organized by local specialized staff in collaboration with local communities and international Academic Institutions and NGOs. The simultaneous screening with rapid test and standardized clinical examination is a model that could replicated in other rural settings in low resource

countries. A further pilot study which will include a rapid test for TB, HIV and SCD is currently being planned.

The form is titled 'BEM-VINDO NO HOSPITAL' and includes the 'ahead' logo. It is divided into several sections:

- PACIENTE E FAMILIAR:** Fields for TB, AF, and OUTRO.
- EXAME MÉDICO:** Fields for PISO, ALTURA, CIRCUNFERÊNCIA DO BRAÇO, and PERC. PESO/ALTURA. Includes a box for 'M'.
- SINTOMAS:** Fields for 'Sua seca', 'Sua produtiva', 'M. pulm', and 'Mbra'.
- EXAME OBJETIVO:** Fields for 'Anagoramento' and 'OUTROS'.
- DIAGNÓSTICO:** Fields for '1º', '2º', and '3º'.
- TERAPIA / ALIMENTAÇÃO:** Fields for '1º', '2º', and '3º'.
- CONSULTAS SEGUINTE:** A table with columns for DATA, PESO, ALTURA, EXAME MÉDICO, and TERAPIA.
- DADOS GERAIS:** Fields for IDADE DA MÃE, IDADE DO PAI, PROFISSÃO DO PAI, PROFISSÃO DA MÃE, NÍVEL DE INSTRUÇÃO DA MÃE, LÍNGUA FALADA EM CASA, N° DE FILHOS, MORADIA, CASA DE BANHO, and ÁGUA EM CASA.
- HISTÓRIA FAMILIAR:** Fields for DOENÇAS OU MORTOS EM CASA, TUBERCULOSE EM CASA, and MALNUTRIÇÃO DA MÃE.
- HISTÓRIA CLÍNICA FISIOLÓGICA – da CRIANÇA:** Fields for PARTO, PERÍODO DE NASCIMENTO, PERÍODO NEONATAL, AMAMENTAÇÃO, DESMAME, and VACINAÇÕES.
- HISTÓRIA CLÍNICA PATOLÓGICA:** Fields for DIARRÉIA, PARASITÓSES INTESTINAIS, INFECÇÕES DA PELE, MALARIA, EPILEPSIA, MALNUTRIÇÃO GRAVE, BRONCOPNEUMONIA, and INTERNAÇÃO EM HOSPITAL.

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Figure.

Disclosures Colombatti: *NOVARTIS*: Consultancy; *Global Blood Therapeutics*: Consultancy; *BlueBirdBio*: Consultancy; *ADDMEDICA*: Consultancy.

- ↩* Asterisk with author names denotes non-ASH members.

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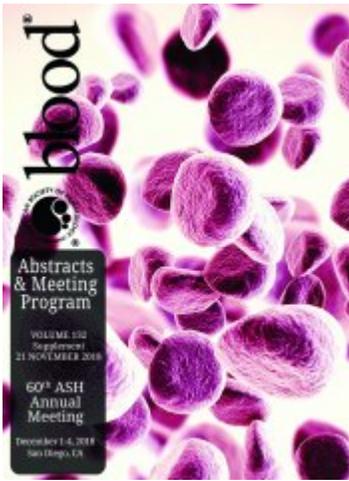


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