

# **Improving care of patients infected with hepatitis B virus (HBV) infection in Senegal**

**Start-up Grant Report**

**Esther Switzerland**

**Summary of the preparatory meeting**

**Fann University Hospital**

**Dakar, Senegal**

**8-9. March 2017**

**Prof. M. Seydi, Dr. G. Wandeler**

## Background

Chronic hepatitis B virus (HBV) infection affects approximately 10% of the general population in West Africa, which makes it one of the most important public health problems in the region. More than one half of all cases of liver cirrhosis and cancers are estimated to be caused by this infection. However, health infrastructures and public health interventions directed towards the care of HBV-infected populations in the region remain poor and access to treatment very limited. Furthermore, general awareness about the disease, its diagnosis and treatment is of concern, even among health care workers: in a recent survey performed in a representative sample of physicians in Senegal, we showed that only 24% of them were aware of the existence of rapid diagnostic tests for HBV and 51% knew that HBV vaccination was safe for newborns (*Jaquet et al. Am J Trop Med Hyg 2017*).

In Senegal, few studies have evaluated the epidemiological and clinical determinants of HBV infection in the general population. Most published data are from specific sub-populations such as HIV-infected individuals, blood donors, military personnel, and patients from University Hospital referral clinics. Overall, the prevalence of chronic HBV infection ranges from 8% to 16%, depending on the setting. In a study among HIV-infected individuals followed at University Hospital Fann in Dakar, we found that 12% had a chronic HBV infection (*Jaquet et al. J Int AIDS Soc 2017*). In addition, HIV infection was identified as a strong risk factor for the presence of liver fibrosis among prisoners in Dakar (*Jaquet et al. BMC Inf Dis 2016*). However, uptake of HBV screening outside of clinical studies is poor, even in referral HIV clinics: less than one half of HIV-infected patients followed at the largest Infectious Diseases Clinic in Dakar had been tested for HBV infection between 2010 and 2012 (*Coffie et al. Med Mal Infect 2017*).

Considering the new recommendations by the World Health Organization (WHO) to screen the general population for HBV infection in all high-prevalence countries, there is an urgent need to improve the uptake of HBV testing, linkage to care, evaluation of treatment eligibility and clinical monitoring. For instance, the WHO recommends the use of three specific indicators to determine treatment eligibility: transaminase levels, HBV viral load and the stage of liver fibrosis. However, access to liver disease staging and HBV viral load measurement is very limited in Senegal due to the high cost of these measurements. We recently showed the importance of longitudinal follow-up to assess treatment eligibility (*Jaquet et al. Liver Int 2017*), highlighting the need for serial measurements in many patients.

While HBV therapy is still out of reach for most HBV-infected individuals in the region, progress towards universal access to these drugs is underway. Tenofovir disoproxil fumarate (TDF), an antiviral drug recommended and widely used in first-line treatment for HIV infection in Senegal, is also highly active against HBV infection and is now accessible as a generic drug at fairly low cost. Many stakeholders have recently expressed the urgent need for a comprehensive strategy for HBV care in Senegal, despite limited diagnostic capacity as well as resources for treatment expansion. With the support of Esther Switzerland, the Departments of Infectious Diseases in Dakar and in Bern decided to organize a meeting in Senegal to discuss the most important barriers to optimal HBV care and set the stage for a long-lasting collaboration between partners to improve the management of HBV-infected persons in this high-burden country.

### **Project description and objectives**

The overarching aim of this project is to develop an institutional partnership between Bern University Hospital and Dakar Fann University Hospital to improve care of patients infected with HBV in Senegal. Based on current standard-of-care for HBV-infected individuals in Switzerland, we plan to adapt diagnostic tools and help improve treatment monitoring of similar patients in Dakar. The Esther Switzerland start-up grant supported the organization of a two-day meeting gathering the main stakeholders in the field of HBV health policy and clinical management in Senegal. The specific objectives of the meeting were:

- To discuss the current state of the HBV epidemic in Senegal in light of available data
- To identify major gaps in terms of HBV diagnosis, treatment and monitoring
- To agree on priorities and potential interventions to improve the management of HBV-infected individuals
- To identify potential barriers to the implementation of novel strategies
- To decide on the ideal platform for clinical data collection and monitoring in the different treatment centers
- To discuss future directions including potential funding mechanisms as well as collaboration with governmental and non-governmental organizations
- To define the organizational framework of the proposed program, including the establishment of a project committee and decide on key partners to involve

### **Partnership**

Dr. G. Wandeler, an attending physician at the Department of Infectious Diseases at University Hospital Bern, was based at Fann University Hospital Dakar during 4 years (2012-2016), where he provided clinical, academic and research support to the Department of Infectious Diseases. With support from the Swiss National Science Foundation and the National Institutes of Health, he helped Prof. Seydi and his team develop a research and training platform on HIV and viral hepatitis infections in West Africa. This collaboration started in the framework of the NIH-funded leDEA-West Africa network, in which both were very active since several years. This research collaboration is led by Prof. F. Dabis (University of Bordeaux), whose expertise has been instrumental for the development of hepatitis-related activities in Dakar. In 2014, Prof. M. Seydi (Department of Infectious Diseases at Fann University Hospital), Prof. F. Fall (Department of Gastroenterology and Hepatology at Principal University Hospital), Dr. A. Jaquet and Prof. F. Dabis (both at University of Bordeaux) as well as Dr. Wandeler (University of Bern) were granted a 1-year initiation contract by the French National AIDS Research Agency (ANRS) to describe practices towards HBV infection in Senegal, including physician's knowledge as well as access to screening, diagnostic and treatment capacities in the country. The mapping of health care facilities and laboratories with available infrastructure and qualified personnel for the management of HBV infection was an important step towards understanding the potential gaps in this field in Senegal. This project was the beginning of a strong clinical, operational and research collaboration between the partners mentioned above.



The two University Teaching Hospitals in which the project is implemented in Dakar, Senegal: Hôpital Fann (left) and Hôpital Principal (right).

This partnership aims at improving many aspects of viral hepatitis management in Senegal: screening and linkage to care of diagnosed patients, pre-treatment assessment of liver diseases, access to treatment, clinical monitoring, and evaluation of outcomes. It is also dedicated to finding additional funding mechanisms to support the planned work and the long-standing experience of the team in the field of clinical infectious diseases and public health will greatly increase the chances of success of this project on the long-run. Knowledge transfer, training, advocacy and improvement of the infrastructure for the optimal management of HBV infection will be key drivers of this partnership.

### Summary of the two-day workshop:

Fifty participants attended the two-day meeting which was held at the Centre de Recherche et de Formation à la Prise en Charge Clinique de Fann (CRCF) on 8. and 9. March 2017 (See [Appendix 1](#) for a full list of participants). Most attendees were health care workers including physicians (infectious



Workshop participants at Fann University Hospital

diseases specialists, hepatologists and general practitioners), nurses, pharmacists and social workers. High-level delegates of the Ministry of Health, NGOs and patient associations, as well as researchers (epidemiologists, social scientists) were also present and actively participated in the discussions.

The following institutions were represented:

- Department of Infectious Diseases, Fann University Teaching Hospital, Dakar, Senegal
- Department of Gastroenterology and Hepatology, Principal Hospital, Dakar, Senegal
- Department of Infectious Diseases, Bern University Hospital, Switzerland

- Institut de Santé Publique, Epidémiologie et Développement, Bordeaux University, France
- University virology laboratories, Dakar, Senegal
- Ministry of Health of Senegal
- Association of patients living with viral hepatitis

The workshop was divided into five main parts (See [Appendix 2](#) for a detailed agenda):

- **Introduction:** Introductory speeches from Prof. M Seydi (Chief of Department of Infectious Diseases, Fann Hospital Dakar, and co-chair of this workshop), Prof. F. Dabis (Epidemiology expert and Principal Investigator of the leDEA-West Africa collaboration), Dr. Khémesse Ngom (Senegalese Ministry of Health [MoH]) and description of the context and agenda of the meeting by Dr. Wandeler (Department of Infectious Diseases, Bern University Hospital, and co-chair of this workshop).
- **Background:** Discussion of the state of the HBV epidemic in Senegal and West Africa, clinical background information and guidelines, as well as presentation of the main results of previous research projects on the topic by members of the team. The knowledge gaps and need for more research on HBV infection were also highlighted.
- **Gaps in HBV management:** A number of challenges in HBV testing, clinical management and monitoring were raised, of which the most important were i) lack of a comprehensive strategy for testing (including the use of rapid tests) and linkage to care, ii) very limited access to HBV viral load measurement, mainly due to high costs, iii) lack of infrastructure and knowledge to evaluate the stage of liver disease, including cirrhosis, due to the high cost of Fibrosan® devices and poor knowledge about other non-invasive scores, iv) limited



access to TDF for the treatment of HBV-infected individuals (although MoH's the plan to provide 12,000 packages of TDF for HBV care by mid-2017 is encouraging), v) poor knowledge of HBV infection management among health care workers, lack of specific training.

*Prof. Dabis, Prof. Fortes, Prof. Fall, Dr. Sall Diop, Prof. Seydi during the panel discussion*

- **Data collection for monitoring and evaluation:** The importance of a user-friendly electronic database for clinical monitoring as well as program evaluation was underlined and the need for implementing a common system in the different HBV care clinics underscored. Such a system was thought by many to also have the potential to improve data analyses and research skills in young academic personnel. V. Sapparart, a database designer from University of Bordeaux, presented a clinical database which could meet the team's expectations. In a separate parallel meeting, he and the database managers from Fann hospital exchanged on related opportunities and challenges for the implementation of such a system in Dakar.

- Way forward: The meeting ended with a summary of the most important ideas and issues raised over the two days and a discussion about next steps (see “outlook and future plans” section below).

Throughout the meeting, the policy and political aspects related to the management of viral hepatitis were highlighted and explained by members of the Senegalese Ministry of Health, who confirmed their strong interest in collaborating with the team and reiterated their support for this initiative. Besides the comprehensive scientific input from clinicians and researchers during the two-day workshop, the opinions and feed-back from participants with other backgrounds but nevertheless very involved in HBV care, including the President of the Senegalese HBV patients association as well as Dr. C. Tchania, a general practitioner in Dakar, were sought and integrated into the general discussion. Overall, the assembly was unanimous in feeling a strong momentum for raising awareness on the issue and agreed to take this opportunity to work more intensely towards the improvement of HBV care in Senegal, in collaboration with other organizations such as the National Hepatitis Program.

### **Outlook and future plans**

The meeting in Dakar has set the stage for a successful collaboration between academic authorities, public health officials, laboratories and patient organizations with the goal of improving testing, treatment and care of persons infected with HBV. Although discussions were focused on facilities and infrastructure in Dakar, the capital city, important stakeholders from other regions (Thiès, St. Louis, Ziguinchor) also participated and showed interest in adapting some of the ideas developed during the meeting to their settings. The main strategic actions that will follow this meeting are the following:

- Draft of a summary report of the meeting in French intended for Senegalese participants and the Ministry of Health in Senegal.
- Building on previous experiences in Switzerland and Senegal, we aim to help two clinical centres in Dakar (Hepatology unit at Hôpital Principal and Infectious Diseases Unit at Hôpital Fann) to develop an electronic data collection system to facilitate clinical work, improve clinical monitoring and develop research capacities, especially for young hepatology and infectious diseases fellows. It was decided to establish a patient monitoring working group led by Prof. L. Fortes, which will draft a patient data collection document in order to improve patient management, monitoring of clinical parameters and evaluation. This document will be based on the one available for HIV infection. In a second step, an electronic version will be adapted for a dedicated database to be developed in collaboration with the data management team from the University of Bordeaux.
- Engaging a strong partnership with public health officials including the Ministry of Health and the National Hepatitis Program to jointly decide on the framework and milestones for the improvement of HBV clinical management in Senegal.
- Submission of a full proposal to Esther Switzerland for the next call for proposals. The main focus of this proposal will be to help establish a structure for the evaluation of liver disease

including transient elastography (Fibroscan®) for liver fibrosis staging, liver ultrasound for hepatocellular carcinoma screening, and liver biopsy for further diagnostics. It will include infrastructure, supplies and training programs.

- Applications for other sources of funding (including ANRS, NIH and private sector companies) will be planned in order to help set up a comprehensive HBV infection clinical and research platform in Dakar.

### **Contact**

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## Appendix 1: List of participants

STRUCTURE	Name	Position
<b>Department of Infectious Diseases (SMIT) University Hospital Fann, Dakar, Senegal</b>	Prof. Moussa SEYDI	Medical Chief of Department
	Prof, Louise FORTES DEGUENONVO	Attending physician
	Dr. Selly BA	Attending physician
	Dr. Viviane M.P. CISS DIALLO	Attending physician
	Dr. Daye KA	Attending physician
	Dr. Khardiata MBAYE DIALLO	Attending physician
	Dr. Alasane DIEYE	Fellow
	Dr. Aminata MASSALY	Fellow
	Dr. Ndèye Maguette FALL	Fellow
	Dr. Moustapha DIOP	Fellow
	Dr. Daouda THIOUB	Fellow
	Dr. Noëlle BENZAKI	Attending physician
	Dr. Bruce Wenbulux SHINGA	Attending physician
	Dr. Arielle Rita BALEM	Attending physician
	Dr. Amadou Oury DIALLO	Attending physician
	Dr. Fatimata Mahamadou OUSMANE	Attending physician
	Dr. Essomba NDONG	Attending physician
	Khadim FAYE	Laboratory technician
Fatoumata Bintou Badiane	Secretary	
Bineta Thiam Mbaye	Secretary	
<b>Ambulatory Treatment Center (CTA), University Hospital Fann, Dakar, Senegal</b>	Dr. Ndèye Fatou Ngom GUEYE	Medical Chief of Clinic
	Dr. Kiné NDIAYE TOURE	Attending physician
	Dr. Malick KANE	Attending physician
	Dr. Makhtar Ndiaga DIOP	Attending physician
	Dr. Khadiatou BA	Pharmacist
	Mamadou GUEYE	Nurse
<b>Fann Regional Research center (CRCF), Dakar, Senegal</b>	Dr. Judicaël TINE	Attending physician
	Dr. Mouhamadou Baïla DIALLO	Attending physician
	Dr. Ousseynou NDIAYE	Chief of laboratory
	Sephora TAMEGNON	Clinical trial monitor
	Dr. Mame Samba NDIAYE	Attending physician
	Ibra Boubacar SOW	Database designer
	Gabrièle LABORDE BALEN	Project manager
<b>St. Louis University Hospital, St. Louis, Senegal</b>	Prof. Ndèye Méry DIA BADIANE	Medical Chief of Infectious Diseases
<b>Thies University Hospital, Thies, Senegal</b>	Prof. Sylvie Audrey DIOP NYAFOUNA	Medical Chief of Infectious Diseases
<b>Department of gastroenterology and hepatology, HOPITAL</b>	Prof. Fatou FALL	Medical Chief of Department
	Dr. Ibrahima DIALLO	Attending physician
	Dr. Bineta NDIAYE	Attending physician

<b>PRINCIPAL, Dakar, Senegal</b>		
<b>Institut de Recherche pour le Développement (IRD), Dakar, Senegal</b>	Dr. Aldiouma Diallo	Senior researcher
<b>Health Center, Ziguinchor, Senegal</b>	Dr. El Hadji Ibrahima SALL	Senior researcher
<b>SOTERIA Medical Practice, Dakar, Senegal</b>	Dr. Corinne TCHANIA	General practitioner
<b>Senegalese Ministry of Health, Dakar, Senegal</b>	Dr. Ramatoulaye SALL DIOP	Senior physician
	Dr. Khémesse NGOM	Director of disease control
<b>Administration Department, University Hospital Fann, Dakar, Senegal</b>	Amadou Lamine FALL	Deputy Director
<b>National Transfusion Center, Dakar, Senegal</b>	Dr. Youssou B. GUEYE	Attending physician
<b>HBV-infected Patient Organization, Dakar, Senegal</b>	Ibrahima GUEYE	President
<b>Department of Infectious Diseases, Bern University Hospital, Bern, Switzerland</b>	Dr. Gilles WANDELER	Attending physician and senior researcher
<b>Institute of Public Health and Epidemiology, University of Bordeaux, Bordeaux, France</b>	Prof. François DABIS	Senior epidemiologist
	Vincent SAPPARART	Database designer
	Dr. Antoine JAQUET	Senior epidemiologist

## Appendix 2: Meeting agenda

<b>Mercredi 8 mars 2017</b>		
<b>Horaires</b>	<b>Activités</b>	<b>Responsable</b>
09h00 – 09h15	Cérémonie d'ouverture et Mot de bienvenue et contexte de la réunion	Dr. Khémesse Ngom, Prof. M. Seydi
09h15 – 09 h30	Programme et organisation de la réunion	Dr. G. Wandeler
09h30 – 10h00	Epidémiologie de l'infection VHB en Afrique de l'Ouest/Sénégal	Prof. L. Fortes
10h00 – 10h30	VHB dans leDEA: l'expérience de Dakar	Dr. J. Tine, Dr. A. Jaquet
10h30 – 11h00	Pause-café	
11h00 – 12h00	Feed-back MobSen	Dr. A. Jaquet, Dr J.Tine
12h00 – 12h30	Prise en charge et traitement de l'infection VHB et guidelines OMS	Dr. G. Wandeler
12h30 –14h00	Pause déjeuner	
14h00 – 14h30	Challenges liés à la prise en charge du VHB dans un centre de référence à Dakar	Prof. F. Fall
14h30 – 15h30	Que faut-il pour améliorer la prise en charge du VHB au Sénégal ?	Prof. M. Seydi, Prof F. Fall, Prof. L. Fortes, Prof. F. Dabis, Dr. A. Jaquet, Dr. G. Wandeler
15h30 – 16h00	Pause-café	
16h00 – 16h30	Evaluation et suivi des patients VHB ; tests biologiques et morphologiques	Dr. G. Wandeler
16h30 – 17h00	Discussion concernant l'organisation du suivi biologique	Dr. O. Ndiaye, Prof. M. Seydi
<b>Jeudi 9 mars 2017</b>		
<b>Horaires</b>	<b>Activités</b>	<b>Responsable</b>
09h00 – 09h15	L'importance du choix d'une base de données et d'un système d'information adaptés	Prof. F. Dabis
09h15 – 09h30	Présentation du système de collecte de données au SMIT	Dr. J. Tine
09h30 – 10h30	Démonstration de la base de données ARPEGE	V.Sapparart,web developpeur
10h30 – 11h00	Pause-café	

11h00 – 12h00	Discussion sur les besoins en système d'information	V.Sapparart, informaticiens SMIT
12h00– 12h30	Accès au TDF pour le traitement VHB au Sénégal	Prof. F. Fall, Prof. M Seydi
12h30 – 14h00	Pause déjeuner	
14h00 – 14h45	Projet AMBAS : synergies et collaboration	Dr. A. Diallo, Dr. S. Boye
14h45 – 15h00	Possibilités de financement du projet	D Dr. G. Wandeler
15h30 – 16h00	Pause-café	
16h00 – 16h30	Questions/discussion générale	Prof. M. Seydi, Dr. G. Wandeler
16h30 – 17h00	Résumé et prochaines étapes	Prof. M. Seydi, Dr. G. Wandeler