

The Cohort of the Sickle Cell Disease Research and Control Center of Bamako (CRLD) - Mali



Prof. Aldiouma Guindo

OUTLINE

- ☐ Presentation of the Center
- ☐ Recrutement and retention strategies
- ☐ General overview of the cohort
- ☐ The use of Hydroxyurea
- ☐ Mortality in the cohort
- ☐ Conclusion



INTRODUCTION

- In Mali, the annual birth rate is currently estimated to be 714,000 and incidence of sickle cell disease is estimated to be 0.8% of live births.

☞ As a result 5,000 to 6,000 newborn with sickle cell disease each year

- To address the issue of reducing the burden of the SCD in Mali,

☞ A Sickle Cell Disease Research and Control Center (CRLD) was established in Mali and as a result of coordinated efforts by the **Government of Mali** and partenaires such as **Pierre Fabre foundation**.



Sickle Cell Disease Research and Control Center of Bamako (CRLD) - Mali

- ☐ A public scientific and technology establishment (EPST) and is affiliated to the office of the Ministry of Health.
- ☐ Organization where most of the work is planned, directed and executed by Malian staff.
- ☐ Since March 2010, 14,697 sickle cell patients have been recruited and are being provided with regular follow-up and access to treatment.



RECRUITMENT STRATEGIES (1)

- ☐ Existing partnerships that CRLD has established with 4 hospitals in the Bamako.
 - ☐ To perform newborn screening of SCD
 - ☐ To increase referrals for early diagnosis of SCD
- ☐ All new patients referred to CRLD with outside SCD testing will have confirmatory testing performed by HPLC at CRLD.

👉 CRLD currently recruits 1,300 -1,500 new SCD patients each year.

RECRUITMENT STRATEGIES (2)

- ☐ Recruitment takes place in person at CRLD.
- ☐ An identification number is assigned to the patient, and
- ☐ A paper medical file and REDCap database file are created.

RETENTION STRATEGIES (1)

Considerable effort is made by CRLD to prevent patients from missing routine scheduled follow-up care visits.

- ❑ Supportive counseling to patients and families by psychotherapist
- ❑ A long-standing patient advocacy group collaborate to help.
- ❑ This advocacy group educates patients about:
 - ☞ The importance of routine follow-up care for SCD patients and
 - ☞ Works to support patients to achieve behavioral changes to highlight the importance of preventive and routine clinical care.



RETENTION STRATEGIES (2)

- ☐ The center provides treatment with no consideration of the financial status of the family.
 - ☞ **equitable access** to care
- ☐ Every patient is given the date of their next scheduled routine visit in advance.
- ☐ In addition, patients are called the day before every scheduled visit in order to remind the patient of the day and time and answer any questions.
- ☐ If the patient does not arrive to the clinic, an additional phone call is placed on the day of the scheduled visit. The clinic will make an effort to re-schedule appointments in a close timeframe if requested by the patient.



THE PREVENTIVE CARE PROGRAM AT CRLD

The preventive care program at CRLD consists of scheduling biannual visits for all enrolled patients.

- ❑ **Folic acid** and **Zinc** supplementation are given.
- ❑ **Penicillin** prophylaxis is given to children under 5 years old.
- ❑ **Vaccinations** are performed at CRLD for *Pneumococcus*, *Meningococcus* and *Salmonella typhi*.
- ❑ **Routine CBC** is performed at each follow-up visit, and once yearly a viral marker screen is performed for HIV, HBV, and HCV and evaluated for allo-immunization.



THE PREVENTIVE CARE PROGRAM AT CRLD

- ☐ Each year CRLD patients undergo **ophthalmologic evaluation** and receive an electrocardiogram.
- ☐ **Transcranial Doppler (TCD)** ultrasound is performed on all SCD patients from the age 2 to 15 years old.
- ☐ CRLD has implemented an **exchange blood transfusion** program for clinical management of severe anemia and for reducing the risk of strokes in children.
- ☐ **Intermittent Malaria Chemoprophylaxis** is provide



THE PREVENTIVE CARE PROGRAM AT CRLD

- ❑ CRLD currently provides HU to 457 SCD patients.
- ❑ At CRLD, HU is initiated for one or more of the following indications:
 - > 3 vaso-occlusive events per year;
 - Acute chest syndrome;
 - Poorly tolerated hemoglobin less than 6 g/dL;
 - Cerebral vasculopathy (TCD \geq 200cm/sec);
 - Cerebrovascular accident; or (7) sickle cell retinopathy on ophthalmologic examination.



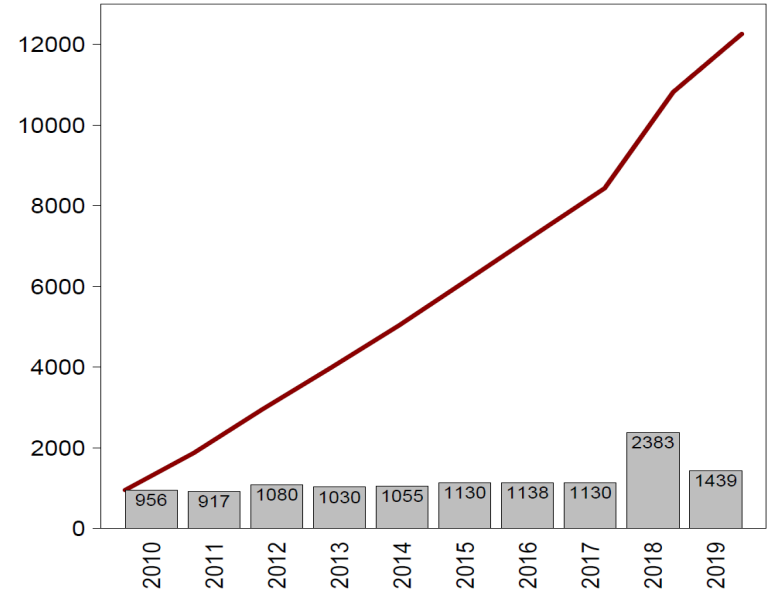
COHORT EVOLUTION

- Longitudinal cohort of 14 697 people living with SCD.

- Patients will contribute:

- Systematic clinical data, receive standardized clinical care, and

- Participate in observational or implementation research studies.



CHARACTERISTICS OF THE COHORT

AGE(Years)	NUMBER	PERCENTAGE (%)
0 – 5	1 691	11.5
6 – 15	4 629	31.5
16 – 25	4 217	28.7
26 – 35	2 458	16.7
36 – 45	1 010	6.8
≥ 46	692	4.7
TOTAL	14 697	100

CHARACTERISTICS OF THE COHORT

PHENOTYPES	NUMBER	PERCENTAGE (%)
SS	6 379	43.4
SC	6 451	43.9
S β^0	729	4.9
S β^+	936	6.3
CC	190	1.3
C β^+	12	0.08
TOTAL	14 697	100



BASELINE v.s ACUTE PHASE

	BASELINE	ACUTE	P VALUE
WBC	10,862 ± 5,057	15,471 ± 10,132	< 0,0001
RBC	3,572 ± 2,007	3,206 ± 1,165	< 0,0001
HGB	9,577± 2,010	8,692 ± 2,307	0,038
HCT	28,795 ± 6,689	26,039 ± 7,328	< 0,0001
PLT	398,358 ± 169,465	401,160 ± 201,060	0,047
MCV	82,372 ± 9,274	83,357 ± 9,680	0,817
MCH	33,349 ± 2,187	33,349 ± 2,187	0,035
MCHC	27,533 ± 3,984	28,060 ± 4,473	0,769



SYSTEMATIC SCREENING OF CEREBRAL VASCULOPATHY

PHENOTYPE	NORMAL	CONDITIONAL	ABNORMAL
SC	3(0,5%)	0(0%)	0(0)
SS	607(93,8%)	32(88,9%)	61(95%)
S β^+	5(0,8%)	0(0%)	0(0)
S β^o	32(4,9%)	4(11,1%)	3(5%)
TOTAL	647	36	64



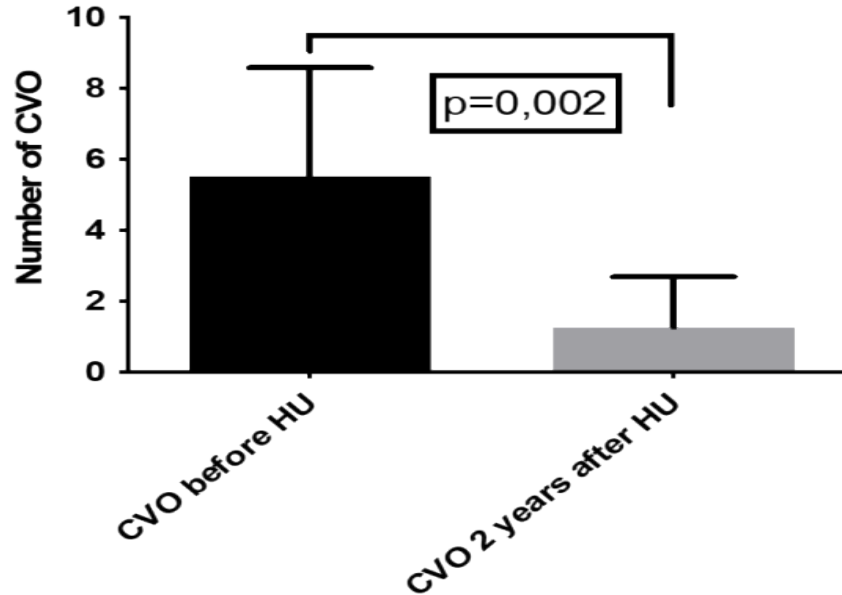
PATIENTS UNDER HU TREATMENT

PARAMETERS	RESULTS
Gender (M/F)	208/249
Initial dose	20mg/Kg
starting Age	20±13 years
Predominant indication	Repeated VOC
hemoglobin increased	8.5 - 9.6g/dL
fetal hemoglobin rate	8.25 - 18.28%
SS	78%
SC	15%
Others	7%

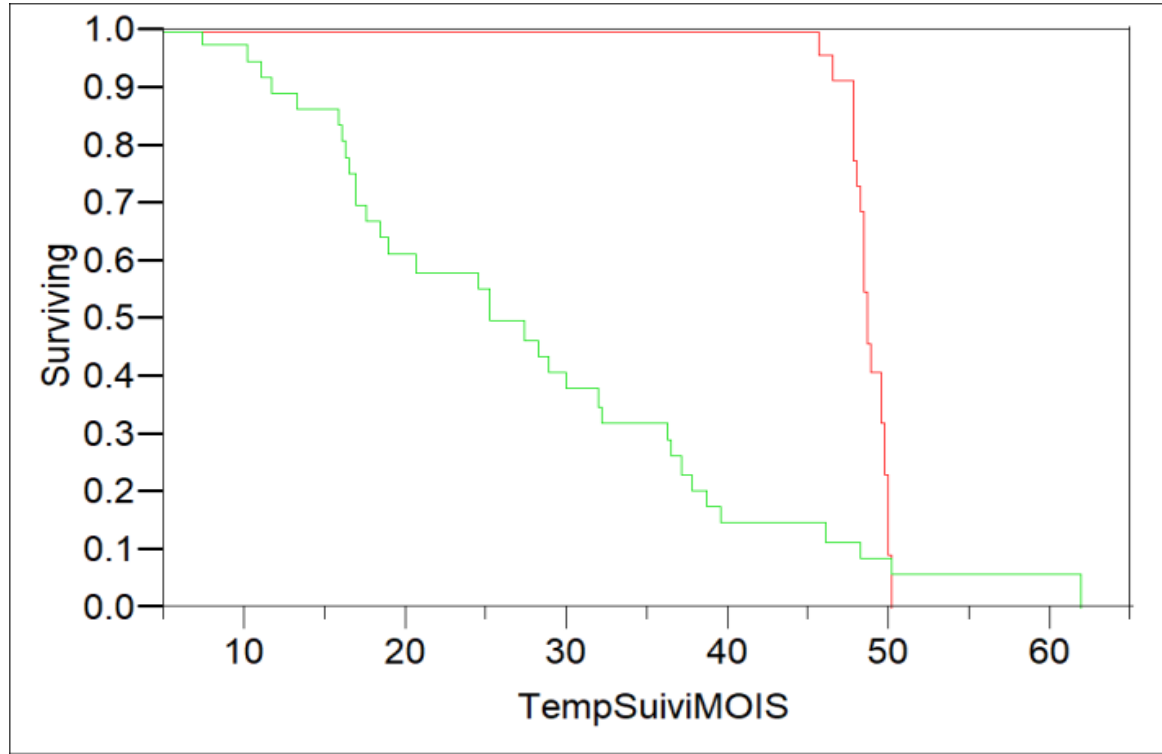


SIGNIFICATIVE REDUCTION OF VOC EPISODES AFTER 2 YEARS TREATMENT WITH HU

CVO before and 2 years after initiation of HU



HYDROXYUREA AND MALARIA



MORTALITY RATE OF THE COHORTE

Age range	Number in the cohort	Number of death	Death rate per 100 persons
≤ 5 years	1 233	17	0.57 (0.34 – 0.90)
6-15 years	3 972	36	0.18 (0.13 – 0.25)
≥ 16 years	7 523	171	0.36 (0.31 – 0.42)
Total	12 728	224	0.32 (0.28 – 0.36)



CHARACTERISTICS OF THE DEATH POPULATION

- ❑ Average age of death: 25.5 ± 14.09 years
- ❑ 64.1% of the death are SS
- ❑ More prevalent in females : 54%
- ❑ Higher between 16 – 30 years old
- ❑ Acute Chest Syndrome is leading cause of death with 32.4%



CONCLUSION

With high-quality diagnostic tools, a well-established preventive SCD program, and low financial burden to patients, coupled with a state-of-the-art electronic database, the CRLD has proven its capability to recruit, register and follow-up SCD patients.

AKNOWLEDGEMENTS

